

Chapter 4

Global Health Partnership and Funding System

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Abstract

In order to increase access to health services in developing countries, there has been considerable establishment of Global Health Partnerships (GHP) in developing countries in recent decades. This paper aims at deepening the understanding of the deployment situation of GHP prevalent in developing countries. In the empirical analysis, this paper attempts to show clearly whether the partnership is carried out among recipient countries and with what kinds of attributes, via the use of cross-country data. The results show that GHP is carried out in countries where the performance of governance is low, and there is a strong and positive correlation between the presence of GHP and the burden of diseases.

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1. Introduction

In order to increase access to health service in developing countries, the point concerning how to secure a fund resource must be debated. The Commission on Macroeconomics and Health (henceforth CMH), which the World Health Organization (henceforth WHO) established in January 2000, indicated that it is possible to raise the economic growth rate by injecting funds into the health sector of developing countries, and it is shown that the investment effect exceeds expense (WHO, 2001). The CMH pointed out that the fact that the health and medical services are not fully accessible to people living in poverty, which is the beneficiary of service, as the biggest problem caused by the financial deficit of the health sector. To overcome this problem, efforts involving the developing countries themselves increasing government expenditure on the health sector are initially called for. Also, in the CMH report, it is advocated that the government of each country, itself, should initially expand the budget allotment to the health sector. Let it be a premise to implement a percentage increase; an increase of 1% by 2015 based on GNP contrast as a concrete numerical target by 2007 (WHO, 2001).

Although some developing countries can attain this target, it is difficult to invest sources of revenue, which are generally restricted in developing countries, into the health sector. Based on the financial situation, suppressed by scarce tax revenues and domestic and overseas debt, allocating funds to the health sector is very difficult in a low-income country. Therefore, for a developing country which suffers from financial deficiency, the role of the external donor, which can bury the financing gap, is presumed to be important. The WHO (2001) has argued strongly of the necessity for financial support and its expansion in a low income country, emphasizing that it is essential that it increase to a 27 billion-dollar level per year by 2007 and a 38 billion-dollar level per year by 2015.

Meanwhile, many Global Health Partnerships (henceforth GHP) have been set up in the health sector in developing countries in recent decades. Although the number already amounts to approximately 100, that focus on different diseases and carry out different functions. Although the point concerning the nature of the tendency shown by the actual condition of a rapidly increasing partnership is a very interesting research subject, there is little research clearly focusing on this point. Further, to analyze whether

the partnerships are supporting a country and with what kind of attribute are also interesting issues. For example, in the CMH report, under the partnership of a donor and a recipient country, in order for a developing country to implement suitable investment management, it is indicated that it is a subject to conquer the structural vulnerability of health and the medical system. In order to promote the reexamination of the fragile public health and medical organization of a recipient country, or unsuitable investment management, the report has claimed that the donor should ensure the fund offer subject to stringent conditions and withhold large-scale aid to countries which engage in inefficient fund management. Therefore, there is room to examine whether support by the partnership is actually offered to countries where there is considerable performance of leadership, accountability, and transparency as well as fund management ability.

This paper aims to deepen understanding of the deployment situation of the partnerships in developing countries. Specifically, it tries to put the partnerships in order from various angles in the first place. Since there are various approaches to such partnerships, mapping out the kind of purpose for the development of the partnership will help the actual condition be understood. Moreover, it can also be clearly shown what kind of organization has played a major role in the health sector in terms of the subject of the participating partnership and that of fund donation. Via empirical analysis, this paper attempts to clearly illustrate whether partnership is carried out among recipient countries and with what kind of attribute by using cross-country data. The point as to whether to proceed with deployment according to the situation of the governance of a recipient country, as pointed out by the CMH report, and whether the partnership suits the needs of a recipient country, is analyzed empirically. The results of this paper are summarized as follows: (1) The neglected diseases were covered by at least one or more partnership/s while a large number of GHPs concentrate on three major diseases, such as HIV/AIDS, tuberculosis and malaria. (2) The contribution of the Gates foundation is significantly high from the viewpoint of fund scale and coverage. (3) The GHP is implemented in a country where there is low performance of governance, and there is a strong and positive correlation between the presence of GHP and the burden of diseases.

This paper is organized as follows. In the next section we present general facts regarding the partnerships. Section 3 describes the data set used for empirical analysis, the specification of model and the estimation results, while Section 4 concludes.

2. General Facts of Global Health Partnerships

2.1 The Definition of Global Health Partnerships

Since a clear definition does not exist, partnerships related to health issues in developing countries have been dealt with to date by various terms, such as Global Health Partnerships (GHP), Global Public Private Partnerships (GPPPs), Global Health Initiatives (GHIs) and International Public Private Partnerships for Health (IPPPH), etc.. In a series of reports about the partnerships undertaken by the health center of the British Government's Department for International Development (DFID), "Global Health Partnerships (GHP)" is adopted as the basic general term based on the following three definitions. The first key criterion is related to "Partnerships". It is defined as a collaborative relationship among multiple organizations, in which risks and benefits are shared in pursuit of a shared goal. The focus is on more formal collaborative ventures and not exclusively on public-private partnerships, although these latter constitute the majority. The second criterion is related to "Health". The purpose of partnership establishment aims to solve health problems of significance for developing countries. The final criterion, "Global" indicates that partnerships must be the framework to cross borders (Caines et al., 2004). This paper follows the approach of the DFID studies which use the term Global Health Partnership.

2.2 The Trends in GHP and Background

As shown in Table 1, which tabulates the number of annual establishments of GHP, a remarkable climb is evident, especially from the second half of the 1990s, peaking in 2000 with 17 new entities. Although Richter (2004) pointed out that the importance of partnership was already recognized in the United Nations in 1990, the year 1997 is shown to have been another turning point in the relation between the United Nations and the business community referring to the statement of the former Secretary-General of the United Nations, Kofi Annan that the relationship with the business community is particularly important. Time is valued almost equivalently and USAIDS was established in 1996 as a collaborative organization, comprising many organizations of the U.N. organizations relevant to HIV/AIDS problems; the WHO, UNICEF, UNESCO, ILO and UNHCR. Thus, in response to the multi-sector approach in

developmental policy, the number of partnerships increases rapidly in 1996 and thereafter.

Table 1: Distribution of GHP over Establishment Year

Est. year	No. GHP	Est. year	No. GHP
1982	1	1993	3
1983	1	1994	2
1984	0	1995	1
1985	0	1996	6
1986	2	1997	7
1987	2	1998	10
1988	1	1999	13
1989	2	2000	17
1990	2	2001	10
1991	0	2002	5
1992	2	2003	4

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPPH)

2.3 The Typology of Global Health Partnerships

This section puts GHP in order from various angles. In order to understand the actual conditions, the nature of the kind of purpose for which the partnership is being developed must be mapped out. Table 2 shows the cumulative number of partnerships over the main objective as of 2003, presented by The Partnerships Database, which was originally created by the Initiative on Public-Private Partnerships for Health (IPPPH).² This database classifies the objectives of partnerships into the following 7 categories: 1. Product Development, 2. Improvement of Access to Health Products, 3. Global Coordination Mechanism, 4. Health Services Strengthening, 5. Public Advocacy, Education and Research, 6. Regulation and Quality Assurance, 7. Other. According to these classifications, the majority of partnerships, 34, target the development of new medicines, and when partnerships aiming to improve access to existing medicine are added, they represent 60 percent or more of the overall total.

² This paper collects the data on GHP from the website of IPPPH; <http://www.ippph.org/index.cfm?page=/ippph/partnerships> (accessed September, 2006).

Table 2: Distribution of GHP over Approach

Approach	No. of GHP
1. Product Development	35
2. Improvement of Access to Health Products	26
3. Global Coordination Mechanism	12
4. Health Services Strengthening	9
5. Public Advocacy, Education and Research	15
6. Regulation and Quality Assurance	3
7. Other	1

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPPH)

The point considering whether specific partnerships are targetting specific diseases is also interesting. Table 3 shows the cumulative number of GHP over a target disease or condition as of 2003. The majority of partnerships, 20, are for HIV/AIDS, reflecting the degree of attention and the seriousness of the plight. There are also many partnerships for other major damaging diseases, such as malaria (18) and tuberculosis (10). The partnership for the three diseases reaches a half among the whole. As for “neglected diseases”³ such as Chagas, human African trypanosomiasis (alias sleeping sickness), leishmaniasis and meningitis, it shows that they were covered by at least one or more partnership/s.⁴ It is indicated that the stance whereby both the public and private sectors are coping with those diseases as a market mechanism does not function.

³ There is no clear definition for ‘neglected diseases’. A renowned non-governmental organization, Médecins Sans Frontières (MSF), cites malaria, human African trypanosomiasis (alias sleeping sickness), leishmaniasis and meningitis as neglected diseases. The WHO and the pharmaceutical industry identified the following parasitic diseases as being truly neglected: African trypanosomiasis, leishmaniasis, and Chagas disease (WHO/IPPMA, 2001).

⁴ Caines (2004) found the same result, namely that the selected neglected diseases, 12 out of 15, are addressed by at least one GHP.

Table 3: Distribution of GHP over Diseases or Conditions

Disease/Condition	No. of GHP	Disease/Condition	No. of GHP
All human diseases and medical conditions	1	Leprosy	2
Blindness	3	Lymphatic Filariasis (LF)	2
Cataract	1	Malaria	18
Chagas	2	Meningitis	2
Chemical safety information	1	Micronutrient deficiency	2
Communicable diseases	2	Neglected diseases	1
Counterfeit and substandard drugs	2	Onchocerciasis (river blindness)	4
Dengue	2	Parasitic and other neglected infectious diseases	1
Diarrhea dehydration	1	Pneumococcal vaccines	1
Digital divide	1	Polio	1
Diseases of the poor	1	Reproductive health	5
Guinea worm (dracunculiasis) disease	1	Schistosomiasis	1
Harmonization of drug applications	1	Sexually transmitted infections	7
Health policies and health systems	1	Tetanus, maternal and neonatal	1
HIV/AIDS	20	Trachoma	3
Human African trypanosomiasis	4	Tuberculosis (TB)	10
Human Hookworm Infection	1	Vaccine vial monitors	1
Injection safety, syringes	2	Vaccine-preventable diseases of the poor	5
Lassa fever	1	Vitamin A deficiency	1
Leishmaniasis	3		

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPPH)

2.4 Participants and Founder of GHPs

Although GHPs target various diseases with various approaches, the question as to the nature of the organization for the subjects having participated in such partnerships remains. Table 4 shows what kind of organization has played the major role in GHPs participating in the health sector. The WHO has participated in many partnerships as expected, while the other top ten rankings include four international organizations, two U.S. Government organizations, three pharmaceutical companies and a private foundation. This table demonstrates how various organizations have cooperatively participated in GHP.

Table 4: Major Participants of GHP

Participants	Number
1 World Health Organization (WHO)	43
2 United Nations Children's Fund (UNICEF)	21
3 World Bank	18
4 Bill & Melinda Gates Foundation	16
5 US Centers for Disease Control & Prevention (CDC)	15
6 GlaxoSmithKline (UK)	13
7 UNDP/WB/WHO Special Programme for Research & Training in Tropical Diseases (TDR)	13
8 US Agency for International Development (USAID)	12
9 Merck & Co., Inc.	11
10 Sanofi-Pasteur (merger of Aventis-Pasteur and Sanofi)	9
11 UK Department for International Development (DFID)	9
12 Joint United Nations Programme on HIV/AIDS (UNAIDS)	8
13 London School of Hygiene & Tropical Medicine	8
14 Pfizer Inc.	8
15 Medecins Sans Frontieres (MSF)	7
16 Novartis	7
17 Bristol-Myers Squibb Company	6
18 Canadian International Development Agency (CIDA)	6
19 Carter Center	6
20 Program for Appropriate Technology in Health (PATH)	6

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPPH)

Table 5: Major Founders of GHP

Founder	Number	Contribution(US\$)
1 Bill & Melinda Gates Foundation	31	4,645,724,419
2 United Kingdom, Government of	2	2,928,720,000
3 France, Government of	3	2,664,751,427
4 US Agency for International Development (USAID)	5	1,539,500,000
5 Italy, Government of	3	1,000,000,000
6 Norway, Government of	6	808,221,757
7 United States, Government of	2	566,420,000
8 European Commission	5	563,870,813
9 Canada, Government of	2	324,220,000
10 UK Department for International Development (DFID)	6	299,421,096
11 Netherlands, Government of	6	265,835,059
12 Spain, Government of	2	240,000,000
13 Japan, Government of	1	200,000,000
14 Canadian International Development Agency (CIDA)	5	137,391,162
15 Bristol-Myers Squibb Company	1	115,000,000
16 Sweden, Government of	2	107,040,000
17 Bill and Melinda Foundation Challenge Grant	1	100,000,000
18 Swedish International Development Agency (SIDA)	4	73,026,600
19 Eli Lilly and Co.	1	70,000,000
20 Merck & Co., Inc.	1	50,000,000

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPPH)

Note: The table is arranged in order of the fund scale.

It is also interesting to investigate about the fund donation organizations. As shown in Table 5, a famous private foundation, the Bill & Melinda Gates Foundation, has overwhelmingly subscribed funds to many partnerships. Further, while the government of each country occupies a higher rank within a fund scale, the contributions of the Gates foundation turn out to be the largest, as shown in the right end column.⁵ It is clear that the Gates foundation is significantly contributing to the development of GHP from the perspective of the scale and coverage of funding. Therefore, partnerships in which the Gates foundation is engaging in fund donations should be investigated in further detail. Table 6 indicates the name of the partnership, the target illness, the contribution amount, and the rate of total occupancy of the Gates foundation donation relative to the overall partnership. As for the coverage, the Gates foundation donates to partnerships covering various diseases, including neglected diseases such as leishmaniasis, malaria, human African trypanosomiasis and meningitis. Further, there exists a frequent tendency for the amount of contribution to each partnership of the Gates Foundation to occupy the vast majority of the total in many cases. Of the partnerships receiving donations from the Gates Foundation, 17 of 29 saw the latter contribute over 80 percent of the total. Moreover, a further 11 partnerships are managed completely solely based on contributions from the Gates foundation. It emerged that in the case of large-scale partnerships, like GAVI or GFATM, the majority of funds were provided by donations from national government, while the Gates foundation was a significant presence in other partnerships.

⁵ The amount of money shows the cumulative fund scale subscribed until 2003, respectively, and the commitment of fund donation is not included.

Table 6: Global Health Partnerships Donated By the Bill & Melinda Gates Foundation

Name	Disease/Conditions	Contribution(\$)	Total(\$)	% of total
Aeras Global TB Vaccine Foundation(Aeras)	Tuberculosis (TB)	107,900,000	112,374,280	96.0%
African Comprehensive HIV/AIDS Partnerships (ACHAP)	HIV/AIDS	50,000,000	100,000,000	50.0%
Children's Vaccine Initiative (CVI) (HISTORICAL)	Vaccine-preventable diseases of the poor	125,000,000	125,000,000	100.0%
Children's Vaccine Programme at PATH (CVP at PATH)	Vaccine-preventable diseases of the poor	152,000,000	152,000,000	100.0%
CONRAD	HIV/AIDS, Reproductive health, Sexually transmitted infections	50,412,100	122,412,100	41.2%
Consortium for Industrial Collaboration in Contraceptive Research (CICOR)	Reproductive health	0	0	
Consortium to Develop New Drugs (CIND)	Leishmaniasis, Malaria, Human African trypanosomiasis	15,100,000	15,100,000	100.0%
Corporate Council on Africa (CCA)	HIV/AIDS	875,000	875,000	100.0%
Foundation for Innovative New Diagnostics (FIND)	Communicable diseases	30,000,000	30,000,000	100.0%
Global Alliance for Improved Nutrition (GAIN)	Malnutrition deficiency	50,000,000	64,000,000	78.1%
Global Alliance for TB Drug Development (TB Alliance)	Tuberculosis (TB)	28,000,000	42,130,000	59.3%
Global Alliance for Vaccines and Immunization (GAVI)	Vaccine-preventable diseases of the poor	1,508,500,000	9,511,200,000	15.9%
Global Alliance to Eliminate Lymphatic Filariasis (GAELEF)	Lymphatic Filariasis (LF)	20,000,000	20,000,000	100.0%
Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)	HIV/AIDS, Malaria, Tuberculosis (TB)	150,000,000	4,563,508,208	3.3%
Global Guinea Worm Eradication Program (GWEP)	Guinea worm (demonulosis)disease	52,500,000	59,500,000	89.9%
Global Reporting Initiative (GRI)	HIV/AIDS	930,000	1,030,000	90.3%
Hope for African Children Initiative (HACI)	HIV/AIDS	10,000,000	10,000,000	100.0%
Human Hookworm Vaccine Initiative (HHVI)	Human Hookworm Infection	39,800,000	39,800,000	100.0%
Infectious Disease Research Institute (IDRI)	Chagas, Leishmaniasis, Leprosy, Malaria, Tuberculosis (TB)	15,000,000	15,000,000	100.0%
Institute for OneWorld Health (IOWH)	Possibly and other neglected infectious diseases	62,940,000	62,940,000	100.0%
International AIDS Vaccine Initiative (IAVI)	HIV/AIDS	128,500,000	271,578,987	46.8%
International Partnership for Microbials (IPM)	HIV/AIDS, Sexually transmitted infections	60,127,319	94,577,355	63.6%
International Vaccine Institute (IVI)	Buberculosis, Dacryocyst	21,000,000	62,278,839	33.7%
Malaria Vaccine Initiative (MVI)	Malaria	257,600,000	2,38,100,000	99.8%
Medicines for Malaria Venture (MMV)	Malaria	170,000,000	235,853,939	72.1%
Meningitis Vaccine Project at WHO/PATH (MVP)	Meningitis	70,000,000	70,000,000	100.0%
Pediatric Dengue Vaccine Initiative (PDVI)	Dengue	55,000,000	56,075,000	98.1%
Tuberculosis Diagnostics Initiative (TDI) (HISTORICAL)	Tuberculosis (TB)	10,000,000	11,000,000	90.9%
Vaccine Fund (VF)	Vaccine-preventable diseases of the poor	1,508,500,000	5,507,740,000	27.4%
Total		4,763,724,419	21,614,148,748	22.0%

Source: The Partnerships Database by the Initiative on Public-Private Partnerships for Health (IPPH4)

3. Empirical Analysis of Global Health Partnerships

3.1 Model Specification

The CMH report has claimed that the donor should ensure stringent conditions for the fund offer and withhold large-scale aid to countries with inefficient fund management (WHO, 2001). On the other hand, although GHP are actually progressing in various developing countries, little has been analyzed concerning the actual GHP circumstances. It is an interesting issue to investigate what country-specific factors determine the entry of GHP. In this section, the type of attributes of recipient countries capable of affecting the volume of partnership activities are shown. According to the CMH report, the performance of leadership, accountability, and transparency and the fund management ability of investment management are considered important factors when receiving the external funding support. Thus, those country-specific factors can be set as variables that explain the volume of GHP penetration within the country. As a hypothesis, the good governance of a recipient country is expected to have a positive relation with GHP entry if support by GHP has been implemented in a country where the performance of governance is high, as proposed in the CMH report. In the regression analysis, it is examined whether the coefficient of governance index is significantly positive or not, after controlling the country size, the capacity of the health systems and burden of diseases. The demand factor is also important as a determinant for GHP entry. Intuitively, it is presumed that GHP represent applicable support in countries with considerable burdens of diseases and adverse conditions, as well as those with insufficient funds for the health sector. Thus, these factors are expected to be positively related to GHP activities in the recipient country. Since the number of partnerships in each country is a variable, the Poisson regression model, which assumes Poisson distribution for the error term, is used in the estimation by formulating the expected number of partnerships as an exponential function of the country-specific factors as follows:

$$E[p_i | \mathbf{X}_i] = \lambda_i = \exp(\mathbf{X}_i \boldsymbol{\beta})$$

where i indexes the country, and \mathbf{X}_i denotes the vector of country characteristics, indicating the governance, country size, the level of health systems and burden of

diseases. The parameters are estimated using the maximum likelihood estimation method.

Since the estimated coefficients are interpreted as $\beta = \frac{d\lambda_i}{d\mathbf{X}_1} \frac{1}{\lambda_i}$, the marginal effect or elasticities can be calculated. However, there is concern that the equalization feature of the conditional mean and variance is rarely satisfied by the actual data. Since the variance is observed to often exceed the mean of a discrete variable, in addition to the Poisson regression model, the negative binomial model is also estimated to cope with this non-equalization problem between the two.⁶

3.2 Data and Summary Statistics

The data used in the estimation regarding the determinant of partnerships was obtained from data on the partnership investigated by Carlson (2004) on a specific country basis. Carlson (2004) provides a table detailing the partnerships which have entered each country, based on the information on the website of each GHP as of 2003. From the table, the number of partnerships in each country can be used as a measurement of GHP volume by individually counting them. However, it must be noted that this measurement for the volume of GHP activities may be inappropriate because the scale of a fund is a better proxy variable than the number, and it is difficult to confirm these data for each GHP and country, due to restrictions of data. Thus, in this paper, the number of partnerships is assumed to have a strong correlation with its funding scale. In the analysis, 111 nations, which succeeded in collecting data on the country characteristics, were selected from the 127 nations studied by Carlson (2004).

The data on the nature of a country is compiled from various data sources. As a proxy measurement of the key variable, namely the measure of governance in a recipient country, global governance indicators in 2003, provided by the World Bank Institute, have been adopted. These indicators cover 213 countries and territories and assess six dimensions of governance, namely: voice and accountability, political stability and the absence of violence, government effectiveness, regulatory quality, rule of law, and the control of corruption. The indicators are based on hundreds of variables and reflect the views of thousands of citizen and survey respondents and experts worldwide (Kaufmann

⁶ For further details of the Poisson regression model and the negative binomial model, see Hausman, Hall and Griliches (1984) and Cameron and Trivedi (1986), respectively.

et al., 2006).⁷ This paper uses the sum of six indices for these dimensions as the governance index in the estimated equation. As for the burdens of diseases, a measure called the Disability Adjusted Life Years (DALY) has been developed by the WHO. This measure incorporates various kinds of damage imposed by diseases and injuries, such as death and disability, and is hence more suitable than using the number of deaths or the number of infected persons as an index, to illustrate the various burdens of the disease more precisely. In this analysis, the DALY aggregated within the field of “infectious and parasitic diseases” in each country in 2002 is used as a proxy for the magnitude of burdens caused by infectious diseases in the country.⁸ The other national characteristics are compiled from the World Development Indicators 2003. The country size is measured by GDP, converted to US dollars at current rates, and the health expenditure of public sector (percentage of GDP) is included in the estimation as a proxy for the mature degree of the health sector in the country. Summary statistics of these variables and the correlation matrix are presented in Tables 7 and 8, respectively.

Table 7: Summary Statistics

Variable	Mean	Std. Dev	Min	Max
The number of GHP	5.18	4.41	0	19
Governance Index	-2.83	3.6	-9.67	7.15
Burden of infectious diseases (1,000 DALY)	2.92	7.56	0	63.93
Health expenditure by public (% of GDP)	2.79	1.46	0.65	9.73
GDP current US dollars in log	22.73	1.9	17.8	27.87

Table 8: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]
[1] The number of GHP	1				
[2] Governance Index	-0.331	1			
[3] Burden of infectious diseases (1,000 DALY)	0.527	-0.159	1		
[4] Health expenditure by public (% of GDP)	-0.268	0.365	-0.228	1	
[5] GDP current US dollars	0.004	0.129	0.346	-0.074	1

⁷ For further details of the indicators, see Kaufmann et al.(2004; 2005; 2006).The indicators for 1996-2005 are downloadable from the website; www.worldbank.org/wbi/governance/data (accessed February, 2007).

⁸ For further details of the DALY, see Murray and Acharya (1997), World Bank (1993), Appendix B. The estimates for 2002 by cause for WHO member states are downloadable from the website; <http://www.who.int/healthinfo/bod/en/index.html> (accessed February, 2007).

3.3 Estimation Results

The estimation results are presented in Table 9. Column (1) presents the estimates from a specification of the Poisson regression model, and column (2) presents the results for the negative binomial model. Both models include the same set of explanatory variables. The samples are a cross-sectional 111 countries in 2003. The likelihood-ratio test of the over-dispersion parameter of the Neg-bin model indicates the existence of over-dispersion, suggesting that the negative binomial model is presumed to be more appropriate than the Poisson model for the data set. Figure 1 shows the relationship between the cumulative number of GHPs as of 2002 and the sum of 6 indices of governance index. It seems that GHP is targeted at the country which performs low governance as long as this figure is seen.

Table 9: Estimation Results
The dependent variable: The number of GHPs

	(1) <i>Poisson</i>	(2) <i>Neg-bin</i>
Governance Index	-0.054 [0.014]**	-0.05 [0.024]*
Burden of infectious diseases (1,000 DALY)	0.031 [0.004]**	0.055 [0.014]**
Health expenditure by public (% of GDP)	-0.083 [0.036]*	-0.094 [0.059]
ln (GDP)	-0.078 [0.027]**	-0.101 [0.046]*
Constant	3.312 [0.658]**	3.782 [1.104]**
Over-dispersion parameter		0.352 [0.080]**
Observations	111	111
Pseudo R-squared	0.15	0.07
Log likelihood	-318.7	-280.3

Note: Standard errors in parentheses. * Statistically significant at the 5% level, ** at the 1% level. Over-dispersion parameter is tested by a likelihood-ratio test.

Figure 1 :

The Relationship between GHPs and the Governance of Recipient Country

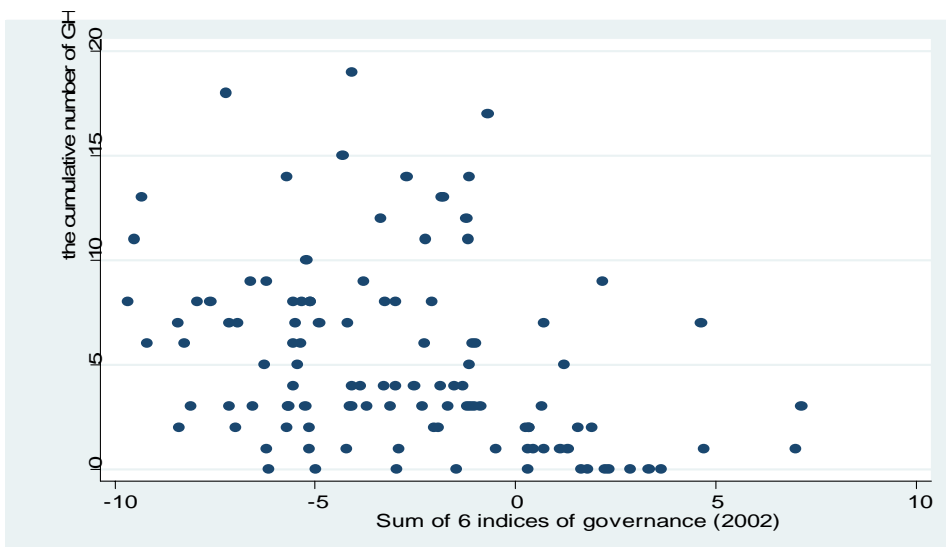
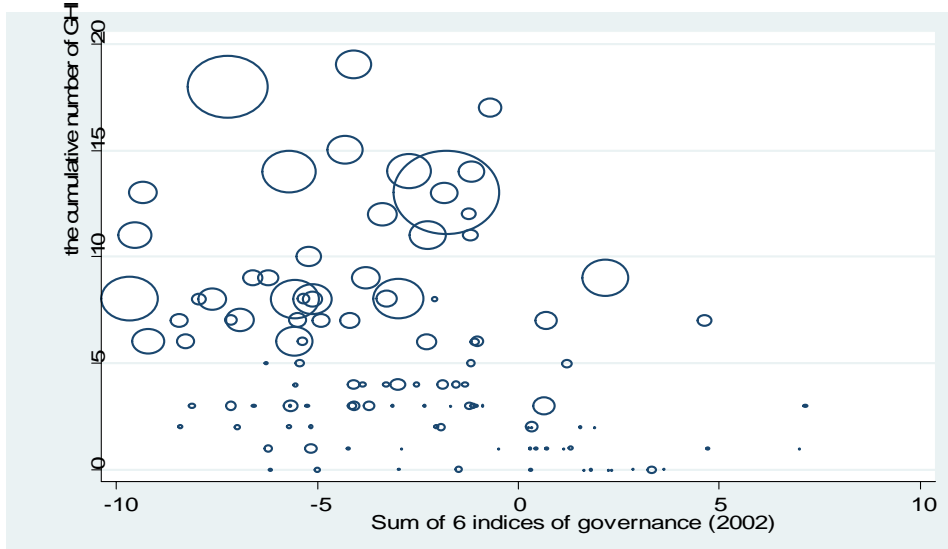


Figure 2 :

The Relationship between GHPs and the Governance Weighted by DALY



Note: The symbols size represent the DALY aggregated within the field of “infectious and parasitic diseases” in each country as of 2002.

In fact, the estimated coefficients on the governance index are significant and negative, contrary to expectations in both the Poisson and negative binomial models.⁹ In both models, the calculated marginal effect of governance on GHP entry was approximately -0.25, implying a decrease in four units of the governance score is associated with one GHP entry in the recipient country on average, with all other factors held constant. Although this result is an interesting finding, it is inconsistent with the argument of the CMH report, namely that the ability of governance and management should be noted as a factor to determine financial support to the country. One explanation for this complicated result may be that the huge burden of diseases, rather than such political factors, has been drawing the support of GHP, an aspect which is partly revealed in the estimation result. The coefficient of the burden of infectious diseases is strongly significant and positive as expected, indicating that the greater the burden of infectious diseases, the higher the number of GHP. Figure 2 also demonstrate the scatter plot of GHPs against the governance, but the size of symbols reflects the DALY aggregated within the field of “infectious and parasitic diseases” in each country. The figure suggests that GHPs target the burden of diseases significantly. It may be reasonable to presume that these results are linked to the fact that almost all GHPs have been carrying out activities suited to the purpose.

Public expenditure in the health sector shows a negative correlation with the number of GHPs while the result of the negative binomial model reveals insignificance. This result is acceptable because it is considered that GHPs help support countries which have insufficient funding for the health sector. The marginal effect of health expenditure in the Poisson model is computed as -0.4, which means a one percent increase in public health expenditure with the ratio for GDP decreasing by 0.4 following the GHP’s entry. The estimation equation also includes GDP in natural logarithms to control the size effect of the country involved, while the GDP coefficient is also negative and significant in both models. This result suggests that GHP may enter a country, even if the country scale is small.

⁹ Without using the sum total of six indexes, even if it used one index such as the index of government effectiveness, the result did not change.

4. Concluding Remarks

This paper investigates the deployment situation of GHP in developing countries, putting GHP in order from various angles, such as approach and targeted disease, and researches the nature of organizations that have played major roles in the health sector, especially in terms of the partnership participating subject and the fund donation subject. A remarkable increase in GHP was especially apparent in the second half of the 1990s, peaking in 2000. So-called neglected diseases were found to be covered by at least one or more partnership/s while many GHPs concentrate on three major diseases, such as HIV/AIDS, tuberculosis and malaria, reflecting the degree of attention and the seriousness of their effects. It is indicated that the stance adopted by the public and private sectors to cope with these diseases via a market mechanism does not function. The results of research into major participants and founders of GHP indicate that the contribution of the Gates foundation is significantly high from the perspective of fund scale and coverage, while various organizations have cooperatively participated in GHP. It should also be noted that substantial numbers of GHPs exist solely on contributions from the Gates foundation.

Further, empirical analysis attempts to clearly show whether a partnership is implemented among recipient countries and with what kind of attribute. Although the CMH report claimed that support by the partnership must be offered to countries where the performance of leadership, accountability, and transparency and fund management ability is high, there is nothing that analyzed the reality of what has actually happened. The earlier study by Carlson (2004), meanwhile, examining the single correlation coefficient between GHP numbers and country characteristics, concluded that there is moderate correlation between the prevalence rate or case number of a disease and the GHP presence, but no correlation between governance and the GHP presence. This paper is the first comprehensive empirical study on the determinants of GHP's entry to control multiple factors simultaneously. The empirical result reveals that GHPs are indeed implemented in countries where the performance of governance is low, contrary to the argument of the CMH report and the previous study. The model also takes into account the burden of diseases as a demand factor, and shows that there is a strong and positive correlation between the presence of GHP and the burden of diseases. One possible

explanation for these results is that the target conditions for GHP exclusively consist of countries where the burden of diseases is high, even if it includes those countries with weak governance. In order to evaluate the financial support administered via the GHP to such countries, the results of this paper cover another controversial issue, namely how the effects of the GHP presence on the health sector in the country differ, based on the governance indicators among recipient countries. Further research should focus on such issue.

While this paper uncovered some interesting facts, several points must be borne in mind relating to the data issue. Since estimations made in this paper are based on the number of GHPs instead of a funding scale and cross sectional data, the results do not necessarily reflect the exact effects and the causality between the GHP presence and the explanatory factors. Further analyses using richer data with time sequences is essential in order to overcome this shortcoming. Moreover, to evaluate the activity of GHP, it will be necessary to collect information on the output of GHP's support. Although these issues remain unsolved and require further examination, it should be noted that the findings on the determinants of GHP prevalence contribute toward deepening understanding of the GHP deployment situation and imply the importance of investigating the possible inefficiency of GHP in countries with low governance.

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