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Tax Reform and Resource Mobilization for Health

December 2015

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CONTENTS

Acronyms.....	iii
Acknowledgments	v
Executive summary.....	1
1. Introduction.....	3
1.1 There is an increased need for domestic resource mobilization for health	4
1.2 Assessing the potential of countries to increase domestic revenues through taxation	4
2. An empirical investigation of the relationship between tax revenue and government health spending.....	7
2.1 Hypothesis.....	7
2.2 Data	7
2.3 Methods	9
2.4 Results	9
2.5 Model discussion.....	11
2.6 Limitations of the empirical investigation	12
3. Selected country experiences show that increased revenue from tax administration reform allows countries to allocate to priority sectors	13
4. Strengthening linkages between domestically-mobilized revenue and health allocation.....	15
4.1 Generating national political priority for health spending	15
4.2 Creation of tax funds specifically for health.....	15
4.3 Earmarking a proportion of tax revenue mobilized	16
4.4 Decentralizing spending.....	16
5. Impact of other mechanisms that can increase fiscal space on government health expenditure.....	17
5.1 Increased government resources from debt relief is associated with an increase in GHE by HIPCs.....	17
5.2 Reallocation of fuel subsidies is often directed toward the health sector	17
5.3 The impact of revenue from newly discovered extractive resources can benefit social sectors but is dependent on governance and government priorities	18
6. Conclusion.....	18
Annex 1. Descriptive Statistics by Income Level	19
Annex 2. Scatter plots	21
Bibliography.....	25

List of Tables

Table 1: Country tax capacity, effort, and corresponding revenue collected by country income level	5
Table 2: Philippines example: theoretical potential for improvements to tax effort.....	5
Table 3: Countries which have achieved significant increases in domestic tax revenue collection.....	6
Table 4: Descriptive statistics	7
Table 5: Regression results; Dependent variable: $\Delta \log(\text{GHE per capita})$	10
Table 6: Variety of tax earmarking for health.....	15

List of Figures

Figure 1: Sources of government revenue and targets of government spending.....	4
Figure 2: Scatter plot of log of tax revenue per capita and log of GHE per capita (1995-2012).....	21
Figure 3: Scatter plot of log of GDP per capita and log of GHE per capita (1995-2012)	21
Figure 4: Scatter plot of log of GGE per capita and log of GHE per capita (1995-2012)	22
Figure 5: Scatter plot of log of external funds for health per capita and log of GHE per capita (1995-2012).....	22
Figure 6: Scatter plot of log of crude birth rate and log of GHE per capita (1995-2012)	23
Figure 7: Scatter plot of log of infant mortality and log of GHE per capita (1995-2012)	23
Figure 8: Scatter plot of governance and log of GHE per capita (1995-2012)....	24

ACRONYMS

DAH	Development assistance for health
DFID	Department for International Development
GDP	Gross domestic product
GHE	Government health expenditures
GGE	General government expenditures
GOL	Government of Lesotho
HDI	Human development indicators
HIC	High-income countries
HIPC	Heavily indebted poor countries
IFC	International Finance Corporation
IMF	International Monetary Foundation
LMIC	Low- and middle-income countries
MOF	Ministry of Finance
MOH	Ministry of Health
MOHSW	Ministry of Health and Social Welfare
SACU	Southern African Customs Union
SURE-P	Subsidy Reinvestment & Empowerment Programme
USAID	United States Agency for International Development
USD	US dollars
VAT	Value added tax
WHO	World Health Organization

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EXECUTIVE SUMMARY

As development assistance for health shrinks and the demand for health expenditures increases, developing countries are under mounting pressure to provide adequate resources for health. Governments can increase available public resources by benefiting from overall economic growth, borrowing, making efficiency gains, and reforming tax laws and improving tax administration, among others. This study examines whether improvements in tax revenue performance due to tax administration reform result in increases in available government funds that benefit the health sector and the conditions that facilitate greater allocations toward health spending.

Many countries are still far from reaching their tax capacity. If countries' tax effort rose to the average rate, then government health expenditures could also increase by meaningful amounts. In an example from the Philippines, this amounted to an increase by an additional \$2-\$8 per capita in government health expenditures. Our analysis of empirical data from 188 countries over 18 years (1995 – 2012) found that the composition of government revenues, particularly the share that comes from tax revenues, is not associated with changes in government health expenditure. In other words, the empirical analysis found that increased tax revenues do not necessarily translate to increased health spending.

Based on the country experiences of Ethiopia and Lesotho, where increases in tax-derived revenue were associated with increased allocation to the health sector, this study identifies four factors that favor the allocation of additional tax revenue toward the health sector: generating national political priority for health, creating tax funds specifically for health, earmarking a proportion of tax revenue mobilized, and decentralizing spending.

In conclusion, increased revenue from tax administration improvements can thus be thought of as an "unguided missile," susceptible to being directed toward a number of differing government priorities.

Nevertheless, the size of the revenue pool that can be captured from increased tax administration efficiency is significant and could benefit the health sector if health is prioritized by the government.

This report is complemented by two in-depth country case studies, El Salvador and Rwanda, available as separate publications. Both of these countries implemented successful tax administration reforms that, together with other measures, significantly increased government allocations to health.

I. INTRODUCTION

As development assistance for health (DAH) declines,¹ populations grow, and, in many cases, the double burden of communicable and non-communicable diseases rises,² countries are under increasing pressure to mobilize more domestic resources for health. Increasing government resources can be accomplished via a variety of strategies including borrowing, benefiting from increases in GDP, and reforming tax policy and strengthening tax administration.

The majority of developing countries have not reached their maximum tax effort, meaning that there is additional revenue which can be collected through modifications to tax policy and strengthening tax policy and administration systems. Much has been written about best practices associated with effective tax administration reform.³⁻⁷ Common tax administration reform activities include the creation of autonomous or semiautonomous revenue authorities, the development of large taxpayer departments^A whose sole focus is the collection of taxes from large companies, human resource and performance management development in tax collection agencies, and improvements to information technology systems like the creation of e-registration and e-filing systems. Tax administration reforms have been shown to contribute to increases in tax revenue performance (tax as a percent of GDP) of up to seven percentage points over 17 years, as was the case in the Democratic Republic of Congo.³

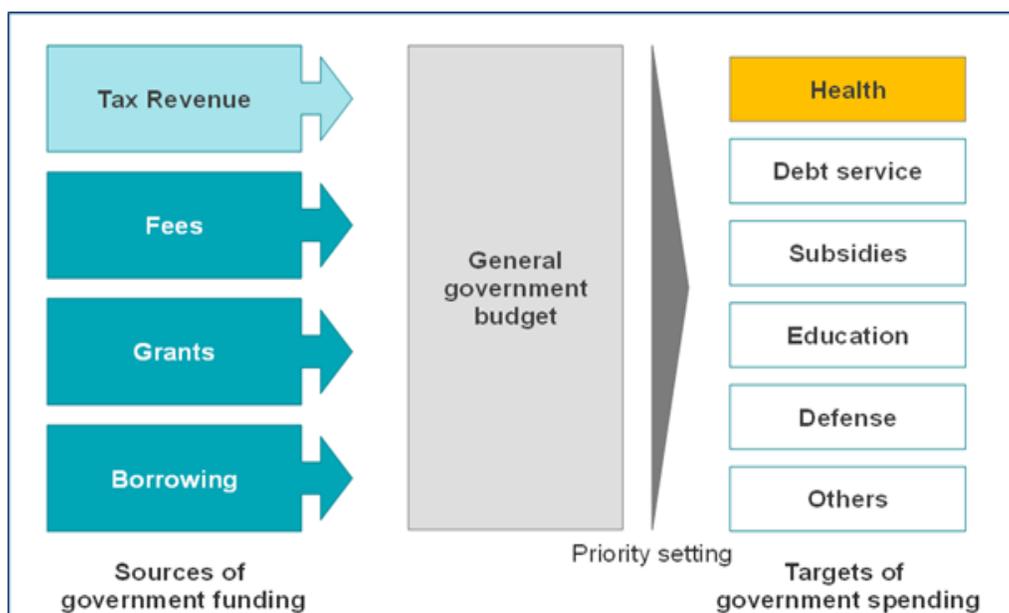
In addition to increasing tax revenue, other circumstances, like debt relief, ending of costly fuel subsidies, and natural resource extraction can be associated with greater government health expenditures (GHE). In this report, we examine both qualitatively and quantitatively whether increases in government revenues from improved tax performance can similarly be associated with increased GHE.

Our empirical analysis (see Section 3) finds that increased tax revenues alone relative to other sources of government funding are not statistically associated with changes in GHE. This relationship is likely explained by the fact that budget allocation decisions are made independently of potential influences by the makeup of government funding; rather, budget allocation is influenced by government priorities and external and internal lobbies. Our qualitative examination of individual country experiences (see Section 4) finds that increased tax revenues, regardless of the cause, sometimes benefit the health sector but also are sometimes directed toward other government priorities such as education, infrastructure, national defense, and others (Figure 1).

Governments may not always choose to direct increased funding from any specific source toward the health sector, and revenues from tax administration reform are no different; for this reason, we include a discussion in this report on ways to improve the likelihood that increased tax revenues will be spent on health, including reprioritizing health within government budgets, leveraging fiscal decentralization, and earmarking. We find that tax administration improvements do have the potential to generate increased government revenues which can then be used to benefit the health sector under certain conditions, notably when health is a government priority.

^A Large taxpayer departments focus on collecting revenue from tax payers who account for majority of tax revenues (usually large, multinational corporations), and promote collection efficiency through a “one-stop” approach.

Figure 1: Sources of government revenue and targets of government spending



1.1 There is an increased need for domestic resource mobilization for health

For many decades, donor programs have been important contributors to health financing in low- and middle-income countries (LMICs)—amounting to \$28.1 billion in DAH in 2012. This figure, however, decreased 4.4% from the previous year, reflecting a trend in DAH in which major donors are facing the economic realities of their slow recovery from the global financial crisis.⁸ Meanwhile, LMICs continue to struggle to finance basic health services to address the high disease burden they face. The estimated increase in expenditure needed to reach the health Millennium Development Goals in low-income countries has ranged from \$60-\$150 billion USD per year, with more than half needed by the poorest 20 countries.^{9,10} Rather than depend upon declining DAH to fill that fiscal gap, many LMICs have the potential to mobilize their own resources to finance health.

1.2 Assessing the potential of countries to increase domestic revenues through taxation

Most high-income countries (HICs) have high levels of tax capacity (size of collectable taxes),⁸ which depends on the level of development, trade, education, inflation, income distribution, corruption and ease of tax collection, size of the formal economy, and unsurprisingly high levels of tax effort (ability to collect majority of potential tax revenue).^{c,11} In LMICs, however, tax capacity levels are substantially lower than those in HICs.

^B. Tax capacity: the maximum level of tax revenues that can be collected in a country as a % of GDP, given its tax structure and prevailing economic and social conditions.

^C. Tax effort: ratio between 0 and 1 of actual tax revenue collected to maximum tax revenues that can be collected (tax capacity) given a country's tax structure and prevailing economic and social conditions.

Table 1 shows that, despite the low tax capacity found in LMICs, the corresponding tax effort has still not yet reached the theoretical maximum set by HICs. This indicates that there is still room in LMICs to mobilize additional domestic resources despite their comparatively lower tax capacity. Improving tax collection through better administration for countries with sub-optimal tax effort has potential to increase government revenues which can benefit the health sector.^D In other words, tax administration reforms can help close the gap between tax capacity and tax effort.

In the case of the Philippines, increasing the tax effort from the current 58% to the LMIC average of 64% would raise an additional \$20 per capita in tax revenue (Table 2). Achieving a tax effort in the Philippines equivalent to the high-income tax effort of 76% would result in an additional \$61 per capita. Assuming that the share of GHE as a percent of tax revenue collected remained unchanged, GHE would also increase by an additional \$2-\$8 per capita in the LMICs and HICs average tax effort scenarios.^E

Table 1: Country tax capacity, effort, and corresponding revenue collected by country income level¹¹

Country groups*	Tax capacity (x)	Tax effort (y)	Total revenue ^D (x)*(y) = (z)
Low-income	26.0	0.65	17.0
Middle-income	37.2	0.64	24.1
High-income	45.1	0.76	34.2

*Based on per capita GDP (PPP, 2005): Low = \$642-\$4,752; Middle = \$4,249-\$17,855;

High = \$18,807-\$68,459

Note: Tax capacity and total revenue in percent of GDP terms

Table 2: Philippines example: theoretical potential for improvements to tax effort

Philippines (World Bank indicators)			
GDP per capita (USD, 2012)		\$1,501	
GHE per capita (USD, 2012)		\$26	
Tax revenue (% of GDP, 2012)		12.9%	
Tax effort (2011)		0.58	
Tax capacity (% of GDP)		23.7%	
Benchmarks¹¹			
Average LMIC GHE/per capita (\$USD, 2012)		\$18	
Average LMIC tax effort		0.64	
Average HIC tax effort		0.76	
Additional revenue which could be captured from greater tax effort (calculated)			
Tax effort	Tax revenue (% of GDP)	Tax revenue (per capita)	GHE/ (per capita) ^E
0.58 (current)	12.9%	\$193	\$26
0.64 (LMIC average)	14.2%	\$213	\$28
0.76 (HIC average)	16.9%	\$254	\$34

Source: Fenochietto (2013) and World Development Indicators

^D. Actual revenues from taxes and social contributions as percent of GDP.

^E. Assuming that current GHE per capita ratio to tax revenue per capita remains constant at current 14% ratio as in 2012.

While many LMICs are still far from reaching their tax capacity, there are some countries operating near their tax capacity, which include Mali, Namibia, Senegal, and Zambia.¹¹ Various reasons could explain the high level of tax effort, including the recent increases of mining activity generating a surge in tax revenues and changes to tax policies.^F These countries have also undergone comprehensive tax administration reform with donor support which may contribute to their tax effort levels. Mali and Senegal, for example, have received technical support to reform their tax administration system from the IMF's Fiscal Affairs Department since 1995.³ Zambia also received the IMF's, DFID's, and other donors' technical assistance as early as 1991.¹²

Quantifying the impact of tax administration reforms is challenging because it is often done concurrently with tax policy reform,^G but effective improvements to tax administration such as the creation of large taxpayer offices have significantly contributed to this progress. Table 3 summarizes countries that have made notable achievements in improving tax revenue collection with USAID tax administration support.

Table 3: Countries which have achieved significant increases in domestic tax revenue collection

Countries	Percentage point change in tax revenue as % of GDP (best 5 year period)	Years of USAID tax administration assistance
Georgia	11	2005-2009 ¹³
Tanzania	6.1	1997-2003 ¹⁴ (DFID intervention 2001-2012) ¹⁵
El Salvador	4.5	1991-1995, 2001-2004 ¹⁶
Guatemala	3.0	1996-2004 ¹⁷
Bosnia and Herzegovina	2.9	2001-2006 ¹⁸

Data sources: IMF Fiscal Affairs Department, Tax Policy Division, update 6/20/13; World Bank World Development Indicators

^F. Note that a country's tax effort can vary due to commodity prices. Successful tax administration reforms should result in sustained improvement of tax effort.

^G. Tax administration reform refers to improvements to the way that taxes are collected, whereas tax policy, which refers to changes in the structure of the tax system, that is, what taxes are collected, who is taxed, and by how much.

2. AN EMPIRICAL INVESTIGATION OF THE RELATIONSHIP BETWEEN TAX REVENUE AND GOVERNMENT HEALTH SPENDING

2.1 Hypothesis

Tax revenue performance improvements as a result of tax administration reforms may impact government funding, and they can be a sustainable way to increase domestic resources. When countries are able to gain financing resources due to increases in tax revenue, does GHE benefit? In the analysis below, we examine the hypothesis that changes in tax revenue relative to other sources of government revenue are associated with changes in GHE. We assume that tax administration reform increases tax revenue, so tax revenue is the independent variable and GHE is the dependent variable in the empirical investigation.

The sections below describe the data, methods, and subsequent results of panel regression analysis used in this model.

2.2 Data

This analysis uses data from 188 countries over years 1995-2012. Country years when population is fewer than 3 million people were excluded from the model to improve data reliability.^H All expenditure data is in real (2005) per capita USD terms and log-transformed.

Health expenditure data comes from the WHO's Global Health Expenditure Database,^I demographic indicators and tax revenue data come from the World Bank's World Development Indicators database,^J and the governance index comes from University of Maryland's Polity IV Project. Country income levels are grouped according to the World Bank's classifications: low, low-middle, upper-middle, and high.^K Table 4 presents the descriptive statistics for data that was used in the regression analysis below; descriptive statistics by income level can be found in Annex I.

Table 4: Descriptive statistics

Variable	All countries				
	No. of jobs.	Mean	Std. Dev.	Min	Max
Dependent: GHE per capita (USD, 2005 constant) ¹	1244	741	1,162	1	5,579
Independent: Tax revenue per capita (USD, 2005 constant) ²	1244	2,388	3,631	7	19,710
Explanatory					
General government expenditures (GGE) per capita (USD, 2005 constant) ²	1244	5,072	7,221	24	30,255
GDP per capita (USD, 2005 constant) ¹	1244	11,885	15,474	127	68,223
External funds for health per capita (USD, 2005 constant) ²	1044	3.1	4.6	0	37
Crude birth rate ²	1244	28	11	13	50
Infant mortality rate (per 1,000 live births) ²	1244	29	31	2	148
Governance ³	1204	5.4	5.4	-9	10

¹Source: World Health Organization, Global Health Expenditure Database

²Source: World Bank, World Development Indicators

³Source: Polity 2 indicator; Polity IV database: <http://www.systemicpeace.org/polity/polity4.htm>

^H. 3,909 country years excluded.

^I. Accessed July 11, 2014.

^J. Accessed July 11, 2014.

^K. More information at: <http://data.worldbank.org/about/country-classifications>.

In the model used, **GHE per capita** is the dependent variable, and **tax revenue per capita** is the independent variable of interest. There is a positive correlation between the log of tax revenue per capita and the log of GHE per capita.

Other factors might be expected to affect government spending on health as well. These factors, called explanatory variables, are included in the model to account for changes in the dependent variable (GHE per capita) that are caused by factors other than tax revenue per capita changes. The explanatory variables that were used in the model are described below; scatter plots showing the relationship between each explanatory variable and the dependent variable of interest (GHE per capita) can be found in Annex 2.

GDP and GGE: Studies that discuss the determinants of health spending concur that richer countries tend to spend more money on health.¹⁹⁻²² Similarly, as a country's national government budget increases, so too does its health spending.^{20,22} GDP per capita and general government expenditures (GGE) per capita both demonstrate positive relationships with GHE per capita.

External funds for health: Development assistance from external donors can influence government expenditures.²¹ LMICs are the main beneficiaries of external funds for health. The literature is mixed on the effect of external funds for health on GHE; on one hand, governments may see external funds for health as a substitution for government funds and therefore reduce their spending as a result. On the other hand, external funds may induce countries to spend more on health services, either because of pressure from or by explicit agreement with development partners or of their own accord. The causality might also be the reverse: donors might provide more for health when LMIC governments spend little.

Crude birth rate: The demographic makeup of a country may influence the amount that its government spends on health.²³ Developing countries tend to spend more on infant and children's health because of their higher fertility rates and younger populations, while developed countries spend more on older age groups because their fertility rates are lower and life expectancy is higher.^L The crude birth rate in a country is included to account for differences in its demographic structure that might influence GHE. Though one would expect the correlation between crude birth rate and GHE to be positive, the income level of a country in practice appears to overwhelm the effect of demographic makeup.

Infant mortality: The health status of a country's population may also affect how much its government spends on health.²⁰ A country with very unfavorable health indicators (high infant mortality, low life expectancy) or high disease prevalence (HIV, tuberculosis, malaria) may spend more money on health to take care of a relatively sicker population. Similar to demographic structure, countries with the least favorable health status are often the countries with lower GDP per capita and hence lower amounts of money to spend on health. Finally, low per capita spending on health might contribute to higher infant mortality and low life expectancy. As a measure of a country's health status, infant mortality is also included in the model.

Good governance: In a democracy, the electoral system can play an important role in determining how governments behave and how government allocation choices take place. However, even in autocratic regimes, leaders may be motivated to prioritize spending in social sectors like health and education. Cross-country analyses in this regard are limited, though existing literature suggests that the more democratic a country is, the more its government procures public goods.²⁴ The model, therefore, incorporates the Polity index, which is a composite score that identifies a country on a scale of autocracy (-10) to full democracy (10).

^L These groups need a disproportionate amount of care compared to the general population.

By including these additional variables in the model, we control for changes in government spending on health due to variables other than tax revenue.

2.3 Methods

As we worked on this analysis, a paper was published in *The Lancet* that analyzes alternative tax structures' effects on the financing of universal health coverage.²⁵ Reeves et al. used a longitudinal fixed-effects model to examine the relationship between total tax revenue and health system coverage that is similar to the issue that this paper addresses, among other analyses. The principal differences between the approach taken by Reeves et al. and this paper are: (1) our model holds general government expenditure (GGE) constant and Reeves et al. does not (our approach to this is explained in the Model Discussion section below) and (2) Reeves et al. analyze a World Bank 2013 World Development Indicators 1995-2011 database that includes 89 countries, while our work analyzes data for the period 1995-2012 for 188 countries from sources that include the WHO Global Health Expenditure Database and the World Bank Development Indicators (see Section 2.2).

Our base model (Model 1) uses components of various studies that have looked at the determinants of GHE and more directed studies concerning specific determinants. Explanatory variables were drawn from studies investigating the determinants of GHE.

Due to the gaps in available data for variables in the model, we use an unbalanced panel of data to perform regression analysis to test the hypotheses. To exploit the panel nature of the data, we first take the first difference of all dependent and independent variables (Model 1). This allows us to control for all unmeasured factors that vary by country but do not change with time. We then perform three variations of Model 1. All models include country fixed effects and year fixed effects. Country fixed effects control for any unobserved factors that affect the rate of growth of the dependent variable that is country idiosyncratic but does not change with time. Time fixed effects capture all unmeasured factors that vary over time but not across entity (worldwide effects like economic booms and busts, for example). Finally, we assume that standard errors are heteroskedastic

but not serially correlated, so robust standard errors are used.^M Formally, we estimate the following equation:

$$\Delta Y_{it} = \alpha * \Delta T_{it} + \Delta X_{it} * \beta + \gamma_t + \rho_i + \varepsilon_{it},$$

where Y_{it} is the natural log of GHE per capita in country i in year t , T is the natural log of tax revenue per capita, and X is a vector of other covariates that have shown to be determinants of GHE. Δ is a one-year difference operator (for example, $\Delta Y_{it} = Y_{it} - Y_{it-1}$), β is a vector of parameters, ε_{it} is the error term, and ρ_i and γ_t are country and year fixed effects, respectively. The parameter α is the focus of our study.

Model 1 is our base case that includes all of the variables that are hypothesized to influence GHE in addition to our variable of interest, tax revenue per capita. We perform analyses using three variations of Model 1 to maximize the number of observations and concentrate on variables that statistically best explain the variance in GHE. Model 2, 3, and 4 exclude variables found to be statistically insignificant. In addition in Model 4, we break out the independent variable of interest by country income group to examine whether the effect of tax revenue on GHE varies by income group.

2.4 Results

The progression of models begins with Model 1, where we included all of the variables considered, and in each a number of determinants of GHE proved to be insignificant, given the other variables included. The only significant variables across the four models are GGE and GDP per capita. External funds for health, crude birth rate, infant mortality, and the governance index all have statistically insignificant relationships with GHE. To include all of the hypothesized variables in Model 1, we were not able to include in its panel all years for all countries since there are missing values for some of the variables in the complete data set.

^M Even if the error term is homoskedastic, by using robust standard errors, we will get correct standard errors.

Table 5: Regression results; Dependent variable: $\Delta \log$ (GHE per capita)

	Model 1	Model 2	Model 3	Model 4
$\Delta \log$ (Tax revenue per capita)	0.083 (0.064)	0.056 (0.056)	0.065 (0.055)	
Low-income countries				0.099 (0.095)
Lower-middle-income countries				0.102 (0.094)
Upper-middle-income countries				0.011 (0.076)
High-income countries				0.007 (0.072)
$\Delta \log$ GGE per capita	0.372*** (0.065)	0.356*** (0.057)	0.312*** (0.058)	0.303*** (0.060)
$\Delta \log$ GDP per capita	0.356* (0.194)	0.445*** (0.156)	0.433*** (0.155)	0.457*** (0.153)
$\Delta \log$ external funds for health per capita	0.003 (0.006)			
$\Delta \log$ crude birth rate	-0.016 (0.210)	0.023 (0.128)		
$\Delta \log$ Infant mortality	-0.112 (0.282)	-0.070 (0.168)		
Governance	0.000 (0.002)	0.001 (0.002)		
Observations	779	1203	1244	1244
Countries	87	112	116	116
F-statistic	3.77	4.77	5.05	4.43
Prob > F	0.000	0.000	0.000	0.000
R ²	0.267	0.249	0.244	0.345

*significant at 10%; **significant at 5%; ***significant at 1%

Hence, Model 1 is applied to 779 observations and draws data from 87 countries; Models 2, 3, and 4 exclude external funds for health which was statistically insignificant in Model 1. Models 3 and 4 exclude the insignificant variables crude birth rate, infant mortality, and governance. These exclusions allow Models 2, 3, and 4 to be applied to higher numbers of observations than Model 1.

Model 3, which limits the independent variables to tax revenue, GGE, and GDP, shows that the coefficient of the independent variable of interest (tax revenue per capita) remains insignificant.

In Model 4, the differential effect of country income group on tax revenue's relationship with GHE is explored. Tax revenue remains insignificantly related to GHE across country income groups.

R² values explain how well the data fits the model that was used.^N Because the specified model regresses changes in log-transformed variables, or growth rates, relatively low R² values like the ones seen here are to be expected.

^N The R² value describes the "goodness of fit" of a model, or how well a regression explains the variation in the dependent variable (in this case, growth in GHE per capita). The R² can have a value between 0 and 1, 1 indicating that the regression is a perfect fit, and 0 indicating that there is no explanation.

2.5 Model discussion

Our empirical findings do not support the hypothesis of a positive effect of tax revenue on GHE. The interpretation of the results we found, however, is complex. In our model (that differs from the Reeves et al. approach in this way), GGE and GDP are held constant, which means that the model can detect whether an increase in tax revenue is associated with a change in the composition, but not the total amount, of government funding. Our analyses of the data show that when there are increased tax revenues, but GGE and GDP are held constant, there are no significant effects on GHE. This insignificant relationship found is consistent across country income levels, reinforcing the finding that the composition of government revenues (specifically, increasing taxes collected as a share of revenues), holding constant GGE and GDP, has no association with the share of available resources allocated to health.

Consistent with the literature, GGE and GDP are significant across Models 1-4 as key determinants of GHE. As opposed to the makeup of government revenues, increases in available budget (GGE) and improvements in national income (GDP) influence the amount a country government spends on health (GHE).

Intuitively, these results make sense. With the exception of earmarked domestic or development funds, the way a government finances its domestic budget from the mix of sources shown in Figure 1 generally has little to do with the ultimate allocation of resources to target areas. Allocation of resources depends largely upon a country's national priorities and internal and external lobbies.

These results show that increasing tax revenue alone relative to other contributors to government revenues is unlikely to affect GHE apart from its effect on increasing GGE. Increases in GGE from tax reform give no more privilege to GHE than increases in GGE from any source.

Our result is not the same as that of Reeves et al., however. Reeves et al. found that tax revenue increases result in greater health spending and that revenues from different kinds of taxes have different effects on health spending. They found that tax revenues generated from capital gains, profits, and income were associated with progress toward funding universal health coverage, whereas revenues from taxes on goods and services did not have this association. Our analysis does not break out tax revenues from different sources. Our finding showing that increased tax revenues are not statistically associated with increases in GHE seems to contradict that of Reeves et al. This could be due to: (1) the approach of holding GGE constant used in our models to isolate the effect of revenue coming from taxes on the composition of GGE, abstracting from growth in GGE's effect on GHE, (2) because of the use of different sources of data that, among other things, covered more countries, or (3) our employing the natural logs of GHE per capita and tax revenue, compared to absolute values in the Reeves et al. approach.

Given our finding that increased tax revenues do not necessarily translate to increased health spending, there are, however, many strategies that can be employed to facilitate allocation of additional resources from tax administration reform or other sources toward health. The methods include reprioritizing health spending within the government budget and securing health sector-specific funds. These strategies are described in Section 3.

2.6 Limitations of the empirical investigation

The results we found suggest that changes in tax revenues are not associated with changes in GHE. To alleviate concerns about omitted variable bias, efforts were made to control for variables that are correlated with both tax revenue levels and GHE levels by using the first-difference of the log-transformed variables. Unobserved factors that are correlated with growth rates of tax revenue and GHE were also taken into account by country fixed effects. Omitted variables that have not been accounted for by these approaches are whose rate of change in growth correlates with that of tax revenue and GHE.

Data availability and quality limit this analysis as well. Publicly available data sources such as those used in this analysis are updated periodically and retroactively in ways that may affect future analyses of this kind. In addition, these data sources sometimes interpolate where data are missing, potentially misrepresenting actual spending figures or health indicators. Short of amassing these indicators through various – often contradictory – sources, however, these data are the best and most comprehensive available with which large-scale country panel analyses can be conducted.

Finally, we are aware that there might be simultaneity problems.^o The authors tested for this possibility in additional models and found no indication that it exists in our model.

^o Simultaneity, or reverse causality, refers to when the dependent variable, in our case GHE per capita, is associated with changes in the independent variable of interest, tax revenue per capita here.

3. SELECTED COUNTRY EXPERIENCES SHOW THAT INCREASED REVENUE FROM TAX ADMINISTRATION REFORM ALLOWS COUNTRIES TO ALLOCATE TO PRIORITY SECTORS

Although this report has focused primarily on examining the relationship between increased revenue from tax administration reform and health sector allocations, it is also valuable to examine qualitative examples (see the boxes on Lesotho and Ethiopia) of where the additional revenue generated from tax administration reform was directed, either to health or other sectors.

Lesotho: Greater revenue from tax collection has benefited the health sector^{26–28}

Lesotho is a small, mountainous country completely landlocked by neighboring South Africa. It is highlighted here as an example of where increased available resources from tax administration reform and increasing GDP has been directed toward government health priorities. The government of Lesotho (GOL) has been the beneficiary of multiple tax administration reform support efforts by DFID and the IMF, which has resulted in a steady and substantial increase in tax revenue collection.^{29,30} GDP also increased substantially in the period overlapping the tax administration reform efforts, due mostly to increased productivity in the mining and other extractive sectors.²⁶

Relative to WHO African Region peers, a greater portion of Lesotho's health budget is financed by the government (~60%), whose contribution to health as a percent of GDP has remained relatively stable over the past decade. Domestic tax revenue excluding South African Customs Union (SACU) is a substantial revenue source for the GOL (32% from 2004-2009), second only to payments from the SACU which has historically accounted for an average of 55% of total government revenues. Recent decreases in revenues from the SACU have placed greater pressure on the GOL to maximize tax collection efficiency to make up for the shortfall.²⁷

Health continues to be a high priority for government³¹ as Lesotho struggles to cope with some of the world's highest prevalence rates of HIV and tuberculosis as well as very high maternal and child mortality.²⁶ While revenue from tax collection more than doubled between 2005 and 2010, the Ministry of Health and Social Welfare (MOHSW) budget per capita also more than doubled during the same time period.^{26,27} Since 2010, both tax revenues and government health spending have continued to grow.³²

Although Lesotho's experience is an example of where greater tax revenue, attributable in part to tax administration reform efforts, was allocated more than proportionally toward health, it is also important to note that more health spending is not necessarily a desirable outcome if questionable choices are made in where the increased health resources are spent. Currently, 51% of Lesotho's MOHSW budget goes toward financing a costly tertiary care hospital in the capital city, which is part of a public-private partnership developed with the World Bank and the IFC. Although this partnership is viewed as successful in light of the 25% projected return on equity for investors, these profits are coming at great expense to the GOL. The Lesotho government is now contemplating building a new district hospital to treat patients which will be less costly than contracting with the private partner for treatment in the tertiary hospital.^{32,33}

Ethiopia: Revenue from tax administration reform was invested in education and agriculture rather than health

Ethiopia is one of the fastest growing economies in Sub-Saharan Africa, with an average annual real GDP growth rate of 10.9% over the past decade.³⁴ Ethiopia also is still heavily reliant on donor funding which provides direct budget support, and DAH accounts for about half of government expenditure.³⁴

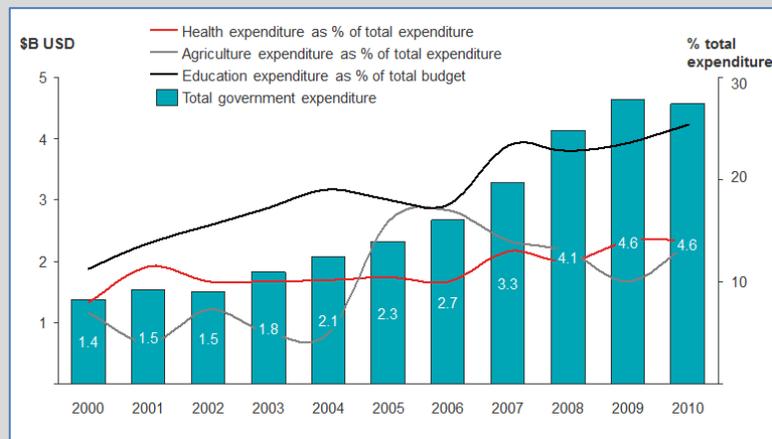
Ethiopia has focused on a number of tax administration strengthening initiatives since 1990, including improving tax collection, compliance, and increasing taxpayer outreach and education. Due to continuous efforts to improve tax administration, tax revenue as a percent of GDP has been increasing steadily, rising from 6.7% in 2009 to 11.6% in 2011.³⁵ However, there are still considerable improvements in tax effort yet to be made given that tax capacity is 17.6%.^{12,35}

An analysis of sector expenditure in Ethiopia shows that the agriculture, national defense, and education sectors were the main beneficiaries of the increased government revenue between 2005 and 2010. Ethiopia continued to invest heavily in education and training, which accounted for 25% of public expenditure in 2010 (up from 19% in 2005). Although health is also a priority for Ethiopia,³⁶ GHE as a percentage of total government expenditures (GGE) have risen modestly from 10 to 13% between 2005 and 2010.³⁴ The agricultural sector, which contributes almost 50% to Ethiopia's GDP, received the greatest increase of public expenditure, rising from 5% in 2004 to 13.7% in 2010 (Exhibit 1).³⁵

Ethiopia's human development indicators (HDI) continue to improve, although Ethiopia's index is still below the Sub-Saharan average. The HDI indicators for education, in particular, have improved dramatically, and literacy rates increased by nearly 10 percentage points between 2005 and 2010, attributable in part to the greater investment that the Ethiopian government has made in this social sector.³⁷ Life expectancy has increased by 5 years between 2005 and 2010,³⁷ which also reflects the gains made in the health sector.

Ethiopia's experience shows how increased revenue from taxation was directed more toward the government's greatest priorities, of which health was important, but not the greatest priority. Although the health sector benefited from the increase in available revenues, agriculture and education benefited to a far greater degree. Ethiopia's example is further complicated by the large amount of donor aid which flows into the country, the bulk of which is directed toward humanitarian and health-related purposes.

Exhibit 1: Trends in social sector spending in Ethiopia, relative to total government expenditure



Source: MOFED, IMF, World Bank indicators

4. STRENGTHENING LINKAGES BETWEEN DOMESTICALLY-MOBILIZED REVENUE AND HEALTH ALLOCATION

Results from the qualitative and empirical analyses described in the earlier sections illustrate that increased tax revenues from improvements in tax administration or another cause may not automatically flow to health. The quantitative analysis described earlier shows no statistically significant association between changes in tax revenues and GHE. Although increases in GHE by developing countries are desirable, governments may have priorities which may, in some cases, justifiably supersede health in terms of immediate spending importance. The extent to which the health sector will benefit from increased revenue from tax revenue performance depends significantly on political will and national priorities.

Outlined below are some conditions which can increase the likelihood that governments will choose to direct additional tax-derived revenue toward the health sector. These conditions center on influencing both political and national prioritization for health spending.

4.1 Generating national political priority for health spending

Increasing prioritization for health requires strong bargaining power by the country's ministry of health (MOH), as well as effective communication between MOH and the ministry of finance (MOF).³⁸⁻⁴¹

Presentation of the evidence of health spending on outcomes, as well as the capabilities of the MOH to make good use of additional funding will provide support for the MOH's position. The bargaining power of the MOH can be further strengthened by good budget and expenditure track records. Experience from the HIPC initiative, where resources freed from debt relief were directed toward the health sector in order to meet the stipulation of spending on poverty reduction activities, shows that many governments already view health as an important investment to increase development. In addition, informing the MOF of macro-economic benefits arising from investments in health can also contribute to the increased prioritization of health within national priorities.⁴²

4.2 Creation of tax funds specifically for health

As part of an overall discussion concerning increases in general tax revenues and government health expenditure, it is also important to discuss taxes earmarked specifically for health. These tax funds can include the so-called "sin taxes" or hypothecated^P value added taxes (VATs), payroll taxes to fund health programs, or other specific levies to fund health.

Earmarked taxes on "sin products" such as cigarettes and alcohol can be dedicated to health. Earmarked taxes might be a fixed percentage of total revenue from a tax such as VAT or might be tagged to a specific tax or fee. Table 6 presents a typology of tax earmarking for health.⁴³

Table 6: Variety of tax earmarking for health

Type	Revenue	Expenditure	Examples
A	Specific tax or fee	Specific end use	Social health insurance premium to provide specified coverage
B	Specific tax or fee	Broad end use	"Sin" taxes used to finance government health spending.
C	General tax	Specific end use	Fixed percentage of total revenue devoted to specific programs.

^P Hypothecated tax: dedication of the revenue from a specific tax for a particular expenditure purpose.

Ghana's national health insurance program is an example of hypothecation. It is funded primarily from an earmarked portion of national VAT, where 2.5 percent of the general VAT collections are complemented by 2.5 percent of contributions to the Social Security (SSNIT) pension fund and premium payments. Over the years, the VAT contribution to the NHIA has grown from 62 percent to about 72 percent of total funding.⁴⁴

Sin taxes on tobacco have been introduced in Thailand and Nepal, Mongolia, Qatar, and Bulgaria.⁴⁵ These countries either earmark all of their tobacco tax revenue for health spending or earmark a percentage of the total tobacco tax revenue for health. Earmarking of alcohol appears to be less common, although Thailand allocates a portion of tax revenue from alcohol to health. The Philippines' Sin Tax Reform Law earmarks a portion of sin tax revenues for universal health coverage through PhilHealth as well as to fund district and regional hospitals.⁴⁶ In 2014, revenues from the Philippines sin tax also began to be directed toward paying for PhilHealth premiums for the near poor.⁴⁷

4.3 Earmarking a proportion of tax revenue mobilized

The experience with earmarking suggests that a strategy to ensure that the health sector benefits from gains from donor-supported tax administration reform might require governments to make a pledge to commit a specific proportion of the additional mobilized revenue to finance health services; however, it is important to note that best public financing principles and practices recommend strongly against earmarking on the grounds that earmarking interferes with optimal resource allocation and can negatively impact on social welfare.⁴⁵ Nevertheless, earmarking is still commonly used as a tool to protect health allocations from other competing sectors, particularly when government health spending is low or unpredictable. Earmarking certainly has been beneficial to certain health sectors (as illustrated in the examples above).

Donors interested in supporting tax administration reform as a means to increase government health expenditures could consider entering into agreements that tax reform assistance will be offered,

provided that recipient governments pledge to increase government health funding with a portion of the increased resources. If governments can accept the terms under which tax administration reform assistance will be offered and agree to fund the health sector with a greater proportion of the increased resources, then tax administration reform could be an attractive mechanism by which donors can support greater domestic mobilization and resource allocation for health.

4.4 Decentralizing spending

Local governments can be made responsible for the delivery of social services, including health and education.⁴⁸ Fiscal decentralization and local government finance reform are important policy directions in many, if not most, developing and transition countries. Fiscal decentralization is often pursued with the goals of improving the delivery of key services, empowering local communities through local governments, and increasing the transparency and equity with which national public resources are allocated.^{48,49}

Additionally, fiscal decentralization can be a contributor to expanding funding for health by using resources provided at the local level more efficiently and in ways more consistently with local wishes than if the services are provided under national control. An analysis of 59 developed and developing economies over a 30 year period by Arze del Granado et al (2012) found evidence that decentralization positively influences the share of government spending toward health and education.⁵⁰

Efficiency increases in public health service delivery have been attributed to fiscal decentralization initiatives;⁵¹ however, an empirical study examining decentralization in Uganda found that rather than increasing spending on social welfare, block grants given to local governments were spent inefficiently on private health goods, at the expense of public goods.^{52,53} The study hypothesizes that smaller local governments will provide goods in line with citizen preferences, and thus will spend more on private goods rather than preventive services.

5. IMPACT OF OTHER MECHANISMS THAT CAN INCREASE FISCAL SPACE ON GOVERNMENT HEALTH EXPENDITURE

GHE is influenced by demand factors (demographic conditions, disease prevalence, household income) and supply side factors, particularly available government budget, and political decision-making.²⁰ The following section describes evidence about the impact of debt relief, subsidy reallocations, and revenue from newly-discovered extractive resources on government health expenditure. These sources of government funding can rapidly increase government resources and have been better studied compared to tax administration reforms with regards to their effects on government health expenditure; thus the impact of these revenue sources on GHE can also offer lessons for the effects of increased tax revenue upon GHE.

5.1 Increased government resources from debt relief is associated with an increase in GHE by HIPC's

Unlike the relationship between tax revenue and health allocation, the relationship between debt relief and GHE has been studied extensively.^{54–56} The release of obligation to debt servicing through initiatives like the Heavily Indebted Poor Countries (HIPC) Initiative, and the corresponding increase in government resources that can be allocated to other items bears some similarity to the increase in resources from greater tax revenue, and so an examination of the evidence of the impact of debt relief on government health expenditures offers valuable insights.

The intent of the HIPC initiative is to significantly reduce a poor country's debt-servicing obligations while freeing up resources to be directed toward poverty reduction.⁵⁴ Interestingly, although increased spending on health is not specifically mandated as part of the HIPC initiative, studies have shown that health spending increased under the broader heading of "poverty reduction"^{54,55} indicating that HIPC countries themselves viewed health spending as a good investment to reduce poverty.

Some of the funds freed up by the HIPC initiative were directed toward the health sector and resulted in an increase in GHE by as much as 1.9 percent of GDP.⁵⁷ A major stipulation of the HIPC initiative is that "the composition of public spending be tilted toward poverty-related allocations,"⁵⁸ which could include paying down domestic or foreign debt or even lowering tax rates in addition to increasing expenditures in the social sector. Although social spending is greatly encouraged by the HIPC initiative, eligible countries were given freedom to decide how best to spend the increased funds for poverty reduction. Spending specifically on health is not a mandatory aspect of the program's stipulation for poverty reduction, and thus the strong relationship between the increased available resources generated by the HIPC initiative and the increase in GHE provides evidence that governments can have some propensity to spend more on health when they have increased government resources to do so and the mandate to direct spending to reduce poverty.

5.2 Reallocation of fuel subsidies is often directed toward the health sector

Many developing countries have adopted fuel subsidies as an attempt to mitigate inflation and global price shocks, including Egypt, Zambia, Nigeria, and Indonesia. Although these subsidies are often characterized as social programs, the policies may benefit the rich more than the poor (who consume much less fuel);⁵⁹ moreover, the subsidies themselves are extremely costly, consuming up to 15% of GDP.⁶⁰

Countries are beginning to realize the ineffectiveness of fuel subsidies and are considering reallocations of the resources spent on them. Nigeria enacted a policy in 2012 calling for the redirection of oil subsidies toward the creation of the Subsidy Reinvestment and Empowerment Programme (SURE-P) which funds infrastructure and social safety net programs including maternal and child health.⁶¹ Similarly, Zambia is considering the removal of fuel subsidies allowing the savings to be redirected toward roads, health, and education. Indonesia is also planning for the removal of a fuel subsidy which currently accounts for 21% of the central government's budget.⁶² It is unclear in Indonesia where the savings will be directed, but there are growing calls that Indonesia redirect the additional

resources to the health sector.^{62,63} Currently, annual spending on fuel subsidies (\$18B USD) by Indonesia is triple that which the government spends on health annually (\$6B USD).⁶⁴

Ending fuel and other subsidies can expand available resources just as increased revenues from tax administration. The cases of governments that are ending subsidies and redirecting the resources toward social sectors, including health, are encouraging concerning the allocation of similar gains from tax administration reforms. The difference is that fuel and other subsidies are more politically visible and therefore encounter resistance to remove.

5.3 The impact of revenue from newly discovered extractive resources can benefit social sectors but is dependent on governance and government priorities

Many LMICs are rich in minerals and hydrocarbons; however, revenues from these extractive resources are often associated with exploitation, increasing poverty, and inequality in a paradoxical cycle known as the “resource curse.”⁶⁵ Nevertheless, there are a number of examples where countries have made commitments to ensure that the revenues from extractive industries are shared equally.

For instance, Indonesia has used extractive revenue to benefit social programs and spur development through investment in pro-poor strategies such as agriculture and rural infrastructure,⁶⁵ and Ghana (which has recently discovered offshore oil) committed to direct the new revenue windfall toward health and other socially beneficial priorities.^{66,67} A study by the UN found that mineral wealth reinforces the positive relationship between national revenues and spending on health, but that the strength of the relationship depends on a country’s economic, political, and social structures.⁶⁸ Ensuring that revenues from extractive resources benefit the social sector is affected by political commitment as well as transparency and accountability.⁶⁶

6. CONCLUSION

Given the overall decreasing trends in DAH, growing populations, longer life expectancies, and changing burdens of disease, LMICs are now under increasing pressure to mobilize more funding from domestic resources to meet the challenge of health costs. There is reason to be optimistic as there is still significant potential in many developing countries to increase the yield from taxes to increase the amount of deployable government resources.

The evidence assembled here shows that increased available government resources, including from debt relief and fuel subsidy reductions, have indeed benefited the health sector. Our analysis found no specific association between increases in tax revenue and government health expenditures, however qualitative analysis found examples of where greater available government resources created through tax administration improvements benefited the health sector, but also found examples of where other sectors benefitted more than health.

Increased revenue from tax administration reform can be thought of as an unguided missile – tax reform efforts can increase total government revenue, but where that revenue is directed is dependent on government priorities. Earmarking and possibly fiscal decentralization can increase the likelihood that tax revenue will be directed toward the health sector; however, ensuring that governments spend additional revenue on sectors that can contribute to poverty reduction and quality of life will require strong persuasive capabilities by the MOH and other health stakeholders including external partners.

Supporting countries to take greater responsibility for financing health is a critical step toward achieving overall development goals. Tax administration reform and tax policy reform are both crucial activities which will further reinforce a government’s capability to effectively and independently generate resources for national priorities. Ensuring that health obtains its share of revenue gains resulting from tax administration reform will require strong support from donors, as well as commitment from governments.

ANNEX I. DESCRIPTIVE STATISTICS BY INCOME LEVEL

Variable	No. of obs.	Mean	Statistic Std. Dev.	Min	Max
Low-income countries					
GHE per capita (USD, 2005 constant) ¹	202	8.6	4.6	1.4	25
Tax revenue per capita (USD, 2005 constant) ²	202	46	26	6.7	118
GGE per capita (USD, 2005 constant) ²	202	82	40	24	207
GDP per capita (USD, 2005 constant) ¹	202	369	129	127	672
External funds for health per capita (USD, 2005 constant) ²	202	5.1	3.8	0.2	21.7
Percent of population under 14 years of age ²	202	43	4.9	30	50
Infant mortality rate (per 1,000 live births) ²	202	71	28	24	148
Governance ³	189	2.1	4.3	-6	8
Lower-middle-income countries					
GHE per capita (USD, 2005 constant) ¹	293	31	24	3.5	130
Tax revenue per capita (USD, 2005 constant) ²	293	176	111	7.1	620
GGE per capita (USD, 2005 constant) ²	293	315	187	57	977
GDP per capita (USD, 2005 constant) ¹	293	1,259	582	461	3,036
External funds for health per capita (USD, 2005 constant) ²	288	3.7	4.0	0	20
Percent of population under 14 years of age ²	293	34	8.8	13	50
Infant mortality rate (per 1,000 live births) ²	293	41	25	8.6	109
Governance ³	292	4.1	5.3	-9	9
Upper-middle-income countries					
GHE per capita (USD, 2005 constant) ¹	284	154	122	6.7	655
Tax revenue per capita (USD, 2005 constant) ²	284	730	486	64	2,728
GGE per capita (USD, 2005 constant) ²	284	1,481	1,125	113	5,936
GDP per capita (USD, 2005 constant) ¹	284	4,156	2,127	645	11,522
External funds for health per capita (USD, 2005 constant) ²	263	2.4	3.3	0	24

Variable	No. of obs.	Statistic			
		Mean	Std. Dev.	Min	Max
Percent of population under 14 years of age ²	284	27	8.6	13	48
Infant mortality rate (per 1,000 live births) ²	284	23	23	3.9	121
Governance ³	269	3	6.1	-7	10
High-income countries					
GHE per capita (USD, 2005 constant) ¹	465	1,866	1,255	153	5,579
Tax revenue per capita (USD, 2005 constant) ²	465	5,811	4,032	97	19,710
GGE per capita (USD, 2005 constant) ²	465	12,429	7,184	1,363	30,255
GDP per capita (USD, 2005 constant) ¹	465	28,306	14,234	4,587	68,223
External funds for health per capita (USD, 2005 constant) ²	291	1.6	6.0	0	37
Percent of population under 14 years of age ²	465	18	3.1	13	28
Infant mortality rate (per 1,000 live births) ²	465	5.1	2.4	2.2	18
Governance ³	454	9.0	2.9	-8	10

¹Source: World Health Organization, Global Health Expenditure Database

²Source: World Bank, World Development Indicators

³Source: Polity 2 indicator; Polity IV database: <http://www.systemicpeace.org/polity/polity4.htm>

ANNEX 2. SCATTER PLOTS

Figure 2: Scatter plot of log of tax revenue per capita and log of GHE per capita (1995-2012)

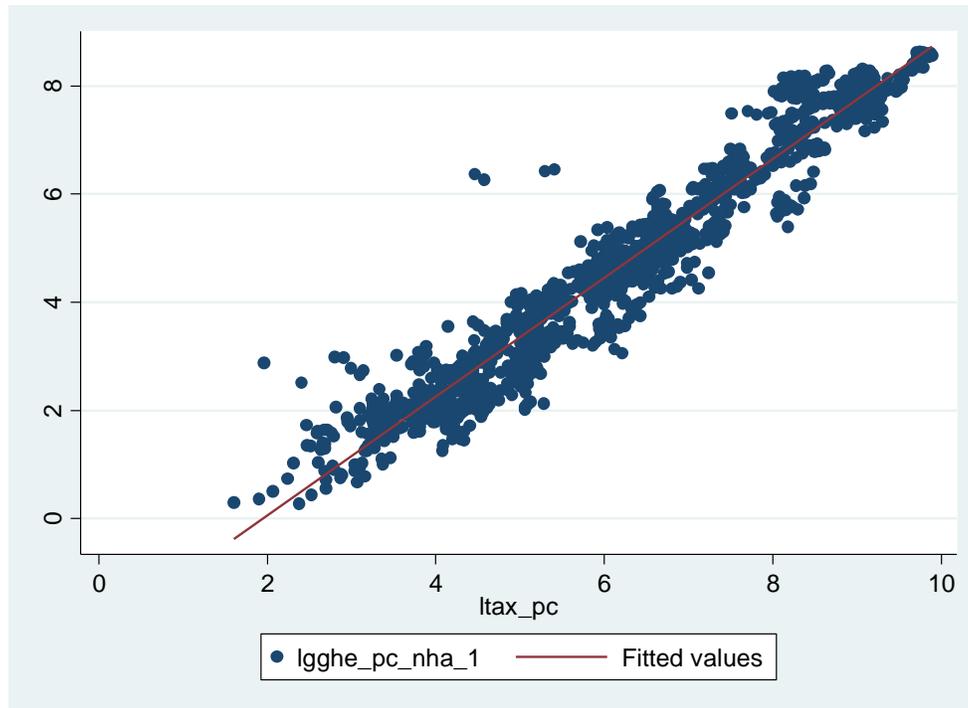


Figure 3: Scatter plot of log of GDP per capita and log of GHE per capita (1995-2012)

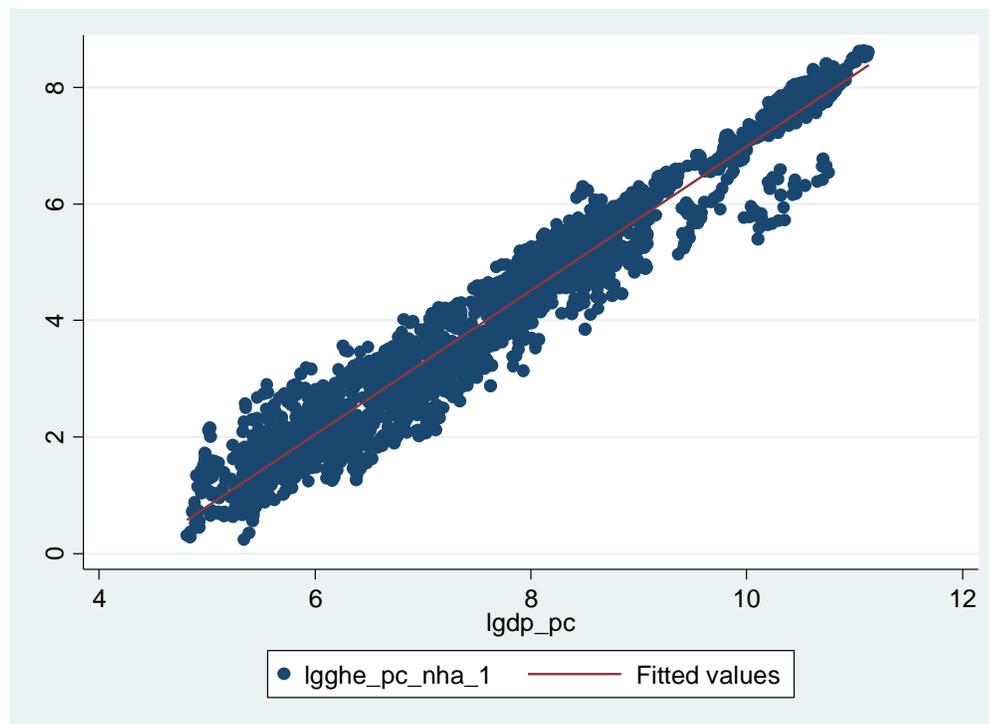


Figure 4: Scatter plot of log of GGE per capita and log of GHE per capita (1995-2012)

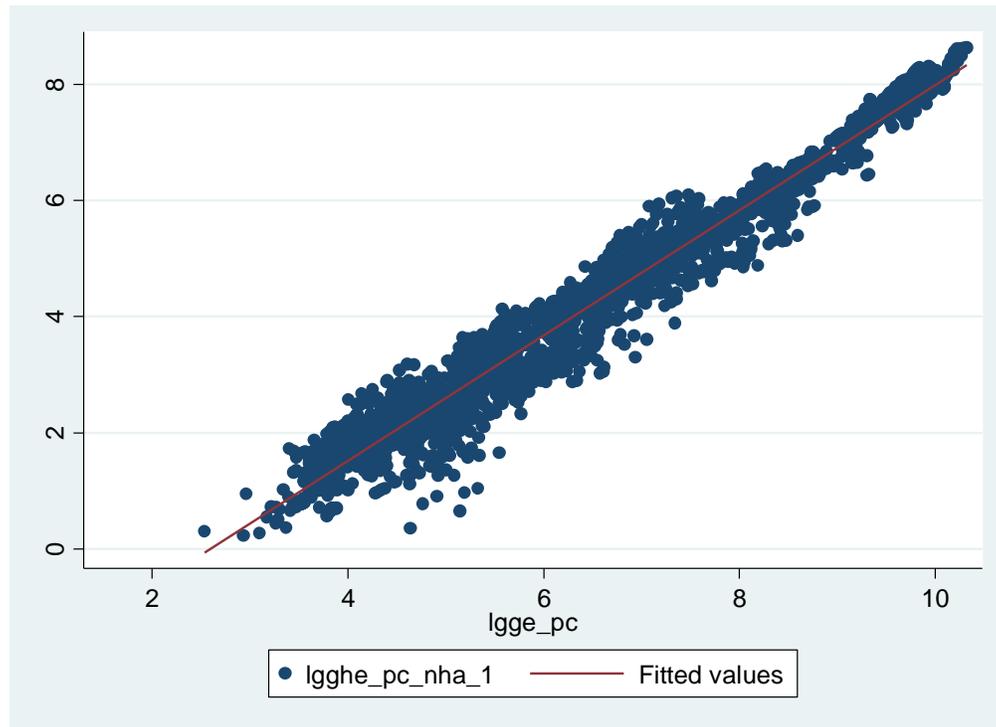


Figure 5: Scatter plot of log of external funds for health per capita and log of GHE per capita (1995-2012)

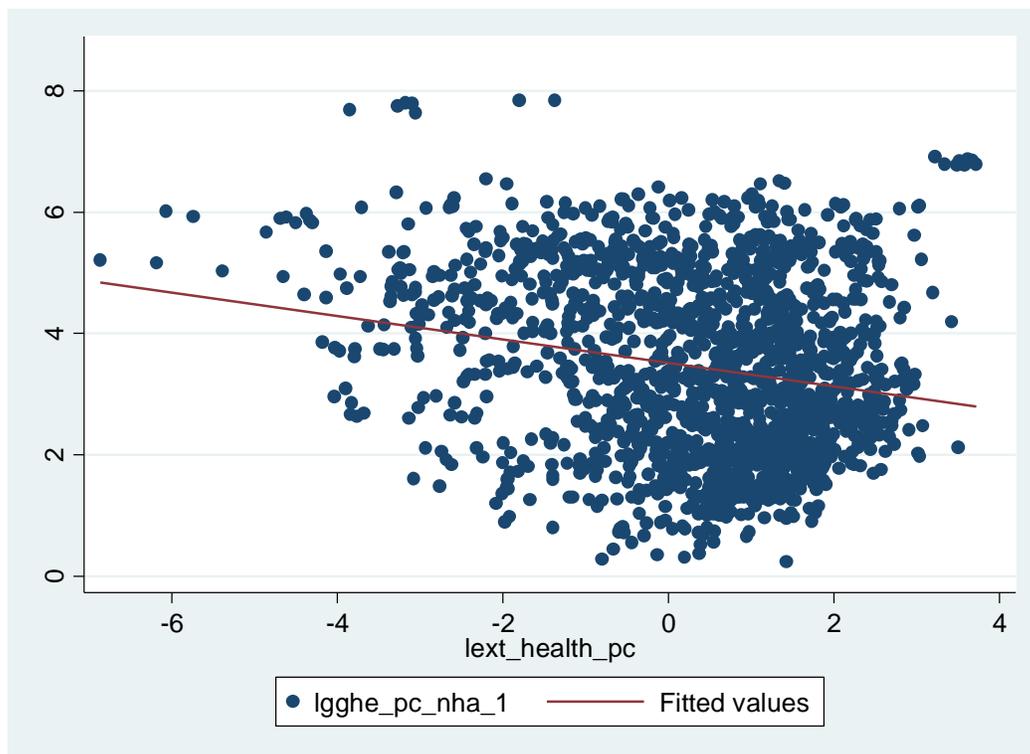


Figure 6: Scatter plot of log of crude birth rate and log of GHE per capita (1995-2012)

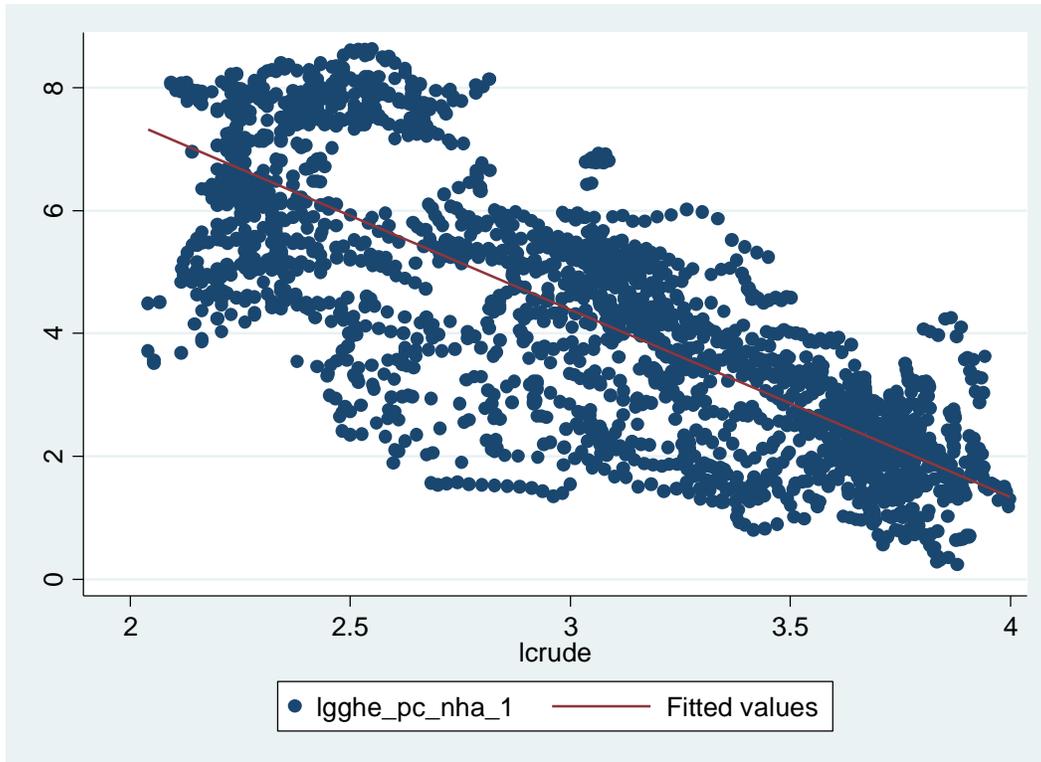


Figure 7: Scatter plot of log of infant mortality and log of GHE per capita (1995-2012)

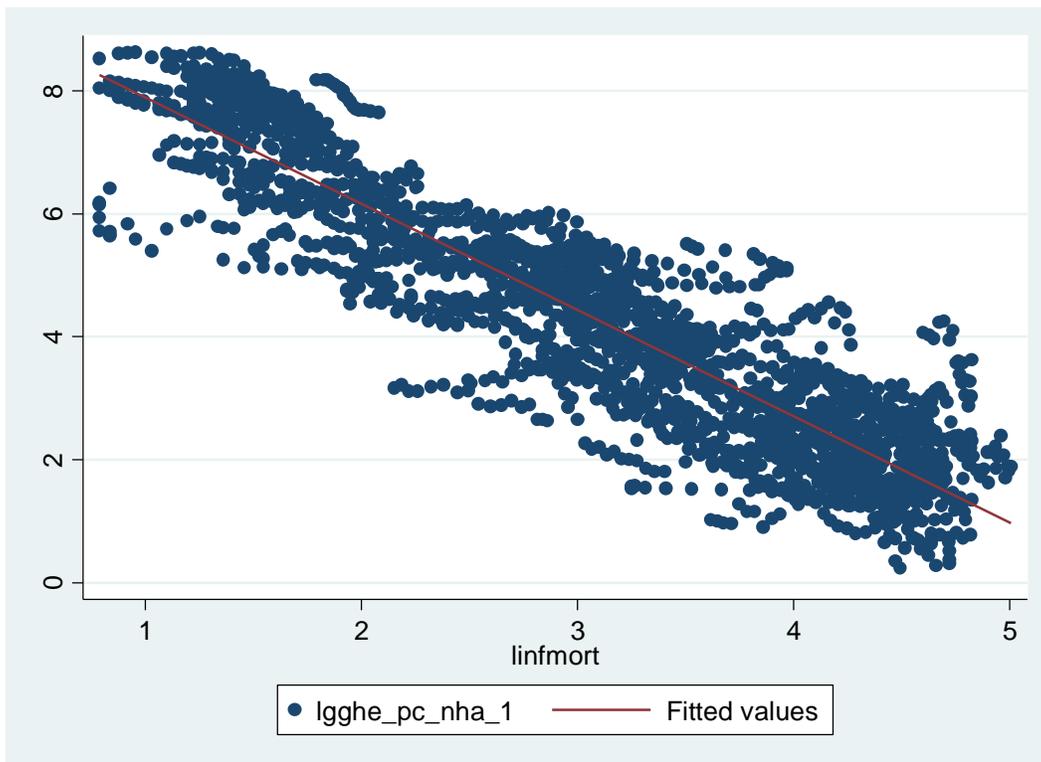
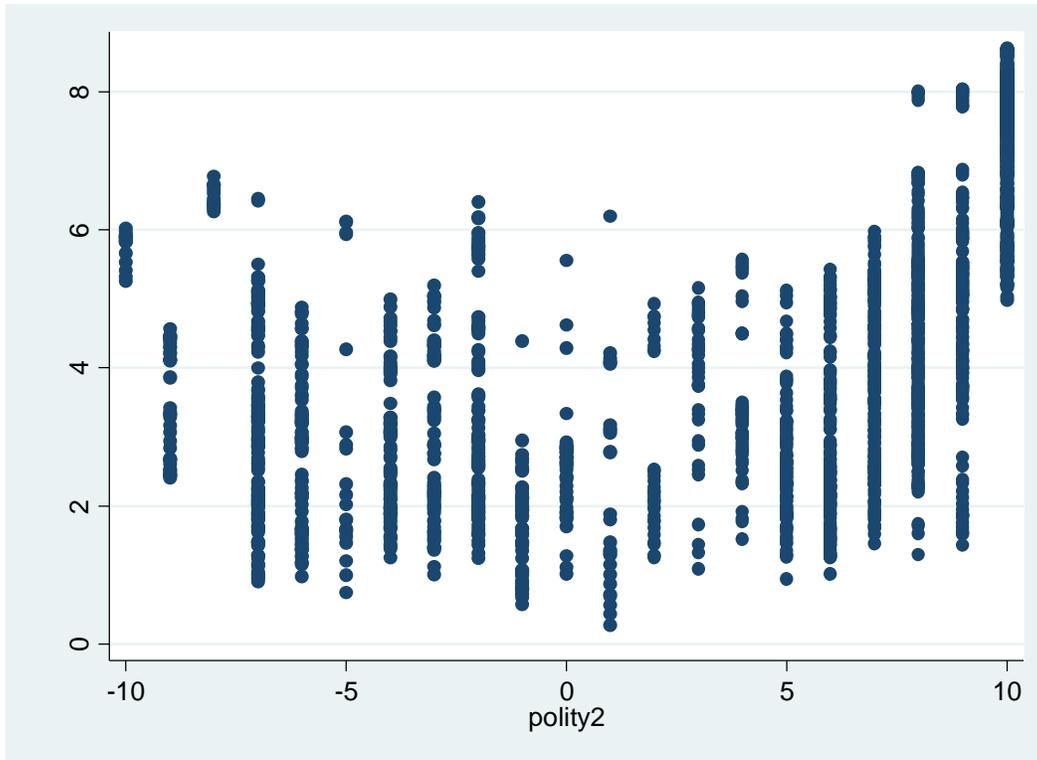


Figure 8: Scatter plot of governance and log of GHE per capita (1995-2012)



Source: WHO Global Health Expenditure Database, World Bank World Development Indicators, and University of Maryland Polity IV Project

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