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Structural adjustment and public spending on health: Evidence from IMF programs in low-income countries

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ABSTRACT

The relationship between health policy in low-income countries (LICs) and structural adjustment programs devised by the International Monetary Fund (IMF) has been the subject of intense controversy over past decades. While the influence of the IMF on health policy can operate through various pathways, one main link is via public spending on health. The IMF has claimed that its programs enhance government spending for health, and that a number of innovations have been introduced to enable borrowing countries to protect health spending from broader austerity measures. Critics have pointed to adverse effects of Fund programs on health spending or to systematic underfunding that does not allow LICs to address health needs. We examine the effects of Fund programs on government expenditures on health in low-income countries using data for the period 1985–2009. We find that Fund programs are associated with higher health expenditures only in Sub-Saharan African LICs, which historically spent less than any other region. This relationship turns negative in LICs in other regions. We outline the implications of these findings for health policy in a development context.

1. Introduction

The International Monetary Fund (IMF or Fund) was established in 1944 with a mandate to safeguard global financial stability, which includes serving as countries' lender of last resort. In exchange for low-cost financing, borrowing nations – often in a dire economic condition – agree on a list of policy reforms. Thus, the IMF has come to influence a wide range of policy areas, including public health. Critics of the Fund have argued that these mandated reforms have damaged health and health systems in borrowing countries. For example, Stiglitz (2002) pointed to Thailand's 'AIDS increase as a result of IMF-forced cutbacks in health expenditures' (p. 20). The Fund promptly responded, accusing Stiglitz of dishonesty and citing rises in health spending (Dawson, 2003).

Despite the often polemical nature of such debates (Goldsborough, 2006), past inquiries into how the IMF affects public health spending have produced mixed results. Analysts connected to the IMF have found a positive impact, and those unconnected have found a negative or mixed impact (see Table 1). A recent study by Fund staff analyzing 'the most comprehensive [social spending] dataset assembled thus far' covering the period 1985–2009 provides a useful point of departure, finding that the IMF's programs have a positive and significant effect on public health spending in low-income countries (LICs) (Clements et al., 2013). We reanalyze this dataset, finding no statistically significant relationship in LICs. However, when we split the sample into a relatively poorer Sub-Saharan African sample and a relatively richer non-Sub-Saharan African sample we find a positive relationship in the former and a more robust negative relationship in the latter.

This article is structured as follows. Section 2 presents the channels linking Fund programs with government health spending, and summarizes existing evidence on this relationship. Section 3 provides a description of our data and addresses methodological issues related to the analysis. Sections 4 and 5 present our findings and report on robustness checks. In the final section, we place our results in the context of progress in meeting health needs, consider the policy implications of our findings, and offer some ways forward for future analyses.

2. Structural adjustment, health spending and the IMF

For most of its seventy-year history, the IMF has been associated with 'conditionality', understood as a set of reforms that borrowing countries must implement in order to obtain access to IMF

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financing. Initially, such reforms entailed reductions in public spending, exchange rate devaluations, and changes to monetary policy (Toye, 1994). From the mid-1980s onwards, however, the IMF began including new and intrusive conditions, that came to be known as 'structural adjustment' policies (Woods, 2006). As a consequence, borrowing countries must implement reforms on wide-ranging policies, such as privatization of state-owned enterprises and liberalization of trade and finance (Summers and Pritchett, 1993; Toye, 1994).

What have the effects of these programs been for health policy and public health expenditures? We posit that the IMF influence on such spending operates through direct and indirect pathways.

Direct pathways concern specific conditions in Fund programs that could plausibly affect health expenditures. First, starting in the mid-1990s, the IMF began to introduce conditions designed to protect social expenditures in light of adjustment (Gupta et al., 2000). However, spending targets are often expressed as shares of GDP, which – in the context of economic contraction – would translate into less total expenditure if the pre-crisis share is maintained. The extent to which these conditions are implemented and the importance that the Fund attached to monitoring them have also been questioned (Kentikelenis et al., 2014b; Goldsborough, 2007; Oxfam, 1995), but – to our knowledge – no systematic comparative data are available on this issue. Furthermore, for LICs that developed a medium-term expenditure framework in the context of their Fund programs, spending targets can become spending ceilings, as countries needed to factor into the target donor financing for health, thereby crowding out public spending (Ooms and Schrecker, 2005).

Second, policies often move beyond spending conditionality to foster a more active reshaping of the health sector. These include enhancing the role of the private sector in healthcare provision (Benson, 2001; Gupta et al., 2000; Loewenson, 1995; Turshen, 1999), introducing cost-sharing for the use of health services (IEO, 2003; Pitt, 1993; Sen and Koivusalo, 1998), and decentralizing health services (Kentikelenis et al., 2014b). While it is possible that public revenue generated from patients or hospital privatization may be reinvested in the health system (thus raising spending), the proceeds may be diverted to other areas of spending, and devolution of responsibilities may occur without concurrent devolution of resources.

Finally, the Fund can be linked to public health expenditure via a 'resource effect' of the low interest credit provided under its programs. These additional resources could be used to boost expenditure to meet health priorities, although in some instances they are used to repay external debt (Gould, 2003). In addition, the Fund has argued that the presence of programs give countries a 'stamp of approval' that can catalyze aid flows (Clements et al., 2013), thus boosting total health expenditures through donor financing. While there is some quantitative evidence for the link between foreign aid and Fund programs (Bird and Rowlands, 2007), it is not necessarily the case that those funds will be directed to health (Rowden, 2009; Stuckler et al., 2010) or that they will be channeled through the government (Lu et al., 2010; Sridhar and Woods, 2010).

While these implications for health expenditures are the most easily traceable, *indirect* pathways – unintended consequences of other policy reforms – may be equally important. A first common condition concerns the budget deficit. The Fund's conservative projections, which form the basis of conditionality, often leave little fiscal breathing space for countries (Kentikelenis et al., 2014b; de Renzio, 2005; Goldsborough, 2007; Rowden, 2009). In the context of overall budgetary retrenchment, health spending can suffer as a result of the attempts of national authorities to meet bailout conditions. Another often-used condition concerns limits on the public sector wage bill. Given that in LICs much of public health spending is directed to salaries of doctors and nurses, general wage limits can drive these expenditures downwards (Van der Gaag and Barham, 1998). Fund policies can also increase prices for medicine and medical technology via currency devaluations that raise the costs of imported drugs and hospital equipment (Musgrove, 1987; Van der Gaag and Barham, 1998).

In addition, Fund-supported policies can have differential effects

Table 1
Empirical evidence on the relationship between structural adjustment and health expenditures.

	Span	Countries	Sample composition	Lender	Method	Dependent Variable: health expenditures as …	Results: adjustment programs associated with …	IFI authors
van der Hoeven and Stewart (1993)	1981–1990	18	Latin America	IFIs	Descriptive statistics	Share of GDP, and share of government spending	Decline in spending	No
Thiesen (1994)	1970–1988	31	Africa	IFIs	Descriptive statistics	Share of government spending	Decline in spending	No
Van der Gaag and Barham (1998)	1970–1993	95	Middle- and low-income	IFIs	Descriptive statistics	Per capita	Increase in spending	Yes
Gupta et al. (2000)	1985–1997	65	IMF borrowers	IMF	Descriptive statistics	Share of GDP	Increase in spending except in transition countries	Yes
IEO (2003)	1985–2000	146	All developing	IMF	ARIMA model	Share of GDP, share of total government spending, and per capita	Increase in spending	Yes
Nooruddin and Simmons (2006)	1980–2000	92	High-, middle- & low-income	IMF	OLS regression	Share of government spending	Decline in spending in democracies; increase in non-democracies	No
Huber et al. (2008)	1970–2000	18	Latin America	IMF	Prais-Winsten regression	Share of GDP	Increase in spending	No
Clements et al. (2013)	1985–2009	59	Low-income	IMF	System GMM and OLS regression	Share of GDP, and share of government spending	Increase in spending	Yes
Current study	1985–2009	63	Low-income	IMF	OLS regression	Share of GDP, share of total and discretionary government spending, and per capita	Decrease in spending in non-Sub-Saharan African LICs; increase in spending in Sub-Saharan African LICs	No

in the near- and long-term. For example, privatizing hospitals and re-investing the proceeds in the health sector can lead to an increase in public spending on the years of these transactions, but might reduce government spending over the long-run.

Given the lengthy experience of developing countries with IMF-designed structural adjustment policies, what quantitative evidence exists to link them to changes in public health spending? A few large sample studies have examined the relationship between public health spending and structural adjustment, but – to our knowledge – only five have looked at the role of the IMF in particular, with mixed results. We summarize their findings in Table 1. Some early studies focused on 'adjusting countries' in general without specific reference to whether the institution in charge of adjustment policy design was the IMF, the World Bank, or both. The samples used are often not directly comparable, as some studies focus on specific regions, on countries at all levels of economic development, or on different measures of public health spending. Overall, authors with links to the Fund or the Bank consistently find evidence of a positive relationship between adjustment programs and health spending, whereas independent scholars yield more nuanced findings.

3. Research design

3.1. Variables

In our analysis we utilize the dataset on social expenditures recently published by the IMF that covers the period 1985–2009 (Clements et al., 2013). Data sources and descriptive statistics are reported in Web Appendices 1 and 2.

We investigate the effects of countries' participation in Fund programs on two widely used public health spending indicators: as a share of GDP and of total government spending. We also examined public health spending per capita (in log). As results did not substantively change, we present those models in a Web Appendix (see below). We measure the presence of an IMF-supported program per country-year using a dummy variable (Clements et al., 2013).

We include a number of controls in the analyses. GDP per capita is expected to be positively associated with public expenditure as a share of GDP due to the so-called 'Wagner's Law', which posits that as economic development takes place state activities expand to cover new administrative, social or other functions, thereby increasing state spending (Brady and Lee, 2014; Nooruddin and Simmons, 2006; Shelton, 2007; Wagner, 1994). The government balance to some extent determines the ability to spend on social programs. Inflation is expected to have an inverse relationship with government spending, as high levels are associated with downward pressures for public expenditures. Negative growth is also anticipated to drive public spending downwards. Trade openness can have either a positive or negative effect: countries could decrease private sector taxation to improve their global competitiveness, thus reducing government revenues to be used for social programs; alternatively openness can lead to a rise in social expenditures as governments seek to shelter and compensate those adversely affected (Rudra, 2008); further, it may lead to increased foreign direct investment and business activity and thus generate additional tax receipts for the state. Overseas development assistance may be related to public health financing in LICs, either by providing additional funds that the state can spend on health or by 'displacing' health spending from the public to the non-governmental sector (Lu et al., 2010). A higher dependency ratio (the combined shares of the population aged under 15 and over 65) is expected to be associated with higher expenditures (Nooruddin and Simmons, 2009). An urbanization variable measures the share of the population living in cities and should have a positive effect since urban dwellers can more easily mobilize to request additional services from governments and offer obvious economies of scale (Baqir, 2002; Bates, 1981). A well-established finding in previous studies is that democratic governments increase public spending on social programs (Huber et al., 2008; Stasavage, 2005), thus we control for the level of democracy. Last, we include a set of country dummies to control for time-invariant country-level characteristics, and a decade dummy for the 2000s. The rationale for the latter is that the IMF reformed the available facilities for low-income countries in 1999, and in cooperation with the World Bank placed emphasis on the design of Poverty Reduction Strategy Papers (PRSPs). As a result, we expect this change in policy direction to be reflected in additional expenditures for health in low-income countries. We also included a dummy variable for the existence of PRSPs in the post-1999 period; these analyses did not yield statistically significant findings and are not presented here. In an augmented model we include variables for health needs and politics-related determinants.

Ethical approval was not required for this paper, as all data used are at the country level and freely available online.

3.2. Estimation techniques

Participation in Fund programs can be seen as a 'treatment' applied for a specific time. Any relationship of IMF programs with public (and health) expenditures will be visible in the short-run, once countries enter into the agreement. However, many LICs enter into multi-year or consecutive programs, therefore Fund-supported programs likely also have longer-term implications.

Consequently, the estimation technique should allow for modeling these two types of dynamics. In line with previous work (IEO, 2003; Nooruddin and Simmons, 2006), we use an error correction model to investigate the relationships in question. This approach enables estimating both short- and long-run effects of the explanatory variables on the outcome variable using ordinary least squares regression. While these models are derived from a simple transformation of static models (used for examining levels of spending), the intuition behind them may not be immediately apparent; we elaborate on the estimation methods in Web Appendix 3. Our model takes the following basic form:

$$\Delta Y_{i,t} = \alpha_0 + \alpha_1 Y_{i,t-1} + \beta_1\, IMF_{i,t-1} + \beta_2\, \Delta IMF_{i,t} + \beta_j\, C_{i,t-1} + \beta_k\, \Delta C_{i,t} + t_{2000s} + \mu_i + \varepsilon_{i,t} \quad (1)$$

In Equation (1), $\Delta Y_{i,t}$ is the year-to-year change in health expenditures in country i and year t, $Y_{i,t-1}$ is a lag of level of expenditures to correct for first-order serial correlation, $\Delta IMF_{i,t}$ measures whether a country entered into an agreement with the Fund in a given year, $IMF_{i,t-1}$ indicates whether a Fund program was in place the preceding year, $C_{i,t}$ denotes a vector of controls (estimated in first differences and lags), t_{2000s} is a decade dummy for the 2000s, μ_i is a set of country dummies, α_0 is the constant, and $\varepsilon_{i,t}$ the error term.

The interpretation of the coefficients merits discussion. The immediate effects are given by the coefficients of the differenced variables (β_2 and β_k). The coefficients of the lagged variables – if statistically significant – reveal a long-run causal relationship between the dependent and independent variables (Kaufman and Segura-Ubiergo, 2001, p. 567). However, to assess the strength of this relationship further transformation is required: we need to divide the coefficients of the lagged independent variables by the coefficient of the lagged dependent variable and then take the negative value of the quotient ($\beta_1/-\alpha_1$ and $\beta_j/-\alpha_1$). The results of these calculations give us the total long-term effect of the

independent variable on the dependent variable, disbursed over future time periods at a rate of decrease of α_1 per time period (Web Appendix 3; De Boef and Keele (2008)). In other words, unlike the differenced independent variables, these effects are felt over a number of subsequent years with diminishing intensity. The long-run effects cease once the country exits an IMF program. We discuss interpretation in more detail in the Findings section.

For the analysis of our time-series cross-sectional (TSCS) dataset we rely on the methodology for calculating standard errors proposed by Beck and Katz (1995, 1996), which is appropriate for the structure of our data. They show that when TSCS data is heteroskedastic and contemporaneously correlated across panels, OLS using panel-corrected standard errors is an appropriate and conservative regression technique. In doing so, we follow the standard approach used in recent analyses of social expenditures (e.g. Huber et al., 2008).

In the context of our study, a problem arises because some of the same forces that determine the presence of an IMF-supported program also affect our outcome variable, i.e. participation in Fund programs is endogenous. That is to say, a country's participation in an IMF program in a given year is not randomly assigned, and a form of bias is introduced into the analysis because the original circumstances of countries participating in IMF programs are likely to be systematically different from those that do not, which in turn could affect health spending. These original circumstances depend both on observable factors (e.g. 'financial turmoil' variables) and unobservable factors (e.g. willingness to implement reforms). While observable variables affecting both selection into an IMF program and public health spending are already included as controls in our model (namely, GDP per capita and lagged government balance), unobservable factors, like political will, may also be correlated with public health spending (Vreeland, 2003). If we fail to account for these unobserved factors, then their effects may be mistakenly attributed to the IMF program. Given this possibility, additional statistical techniques for estimating the relationship of interest are required.

To deal with this issue, we rely on the established approach used in previous studies by correcting for 'selection bias' (Clements et al., 2013; see IEO, 2003; Nooruddin and Simmons, 2006). In this approach, non-random assignment to the control and treatment groups is treated as an omitted variable problem. We first employ a probit regression to predict participation in Fund programs and compute the so-called inverse-Mills ratio, and then add this term to the vector of controls in Equation (1). A statistically significant inverse-Mills ratio is interpreted as follows: if significantly negative, then unobserved variables that make IMF participation more likely are associated with lower public health expenditure; if significantly positive, then unobserved variables that make IMF participation more likely are associated with higher public health expenditure.

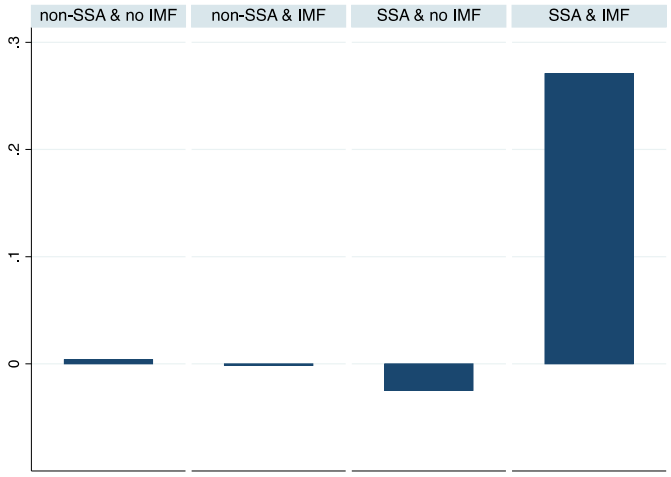

Fig. 1. Mean annual change in public health spending as share of total government spending in LICs, 1985 to 2009.
Source: Authors' calculations on the basis of data by the International Monetary Fund (Clements et al., 2013).

We tested alternative specifications for the first-stage probit model used in the relevant literature and all performed similarly, correctly predicting circa 85% of the cases. For our analyses, we rely on the specification suggested by the IMF's Independent Evaluation Office (2003) as it allowed us to retain most observations and had a high predictive capacity. Right-hand variables include democracy, GDP per capita, lags of IMF program participation, GDP growth, current account balance, and government balance. The logic underlying this method and the results of our regressions to generate the inverse-Mills ratio are presented in greater detail in Web Appendix 4.

In addition to the full sample, we analyze low-income Sub-Saharan African (SSA) and non-Sub-Saharan African (non-SSA) subsamples of countries. Further disaggregation of the non-SSA group was not possible due to an insufficient number of observations in the individual geographical regions to provide meaningful results. The sample split we have adopted is appropriate as it reflects the exceptional circumstances of SSA: the region has historically received special attention from the international community on account of its persistently poor levels of development and well-being (Gereffi and Fonda, 1992; United Nations, 2001; World Bank, 1989, 1994). This opens up the possibility that the effects of IMF participation, as well as the program conditions themselves, may be systematically different in SSA. Fig. 1 shows the mean annual change in public spending on health as a share of total government spending over the period examined. Average increases in spending are observed mainly for SSA countries with Fund programs, while little change or decreases are observed for the other combinations.

The overall trend in low-income countries' health expenditures is to rise over the period covered. However, marked differences remain across regions: health spending in low-income SSA has steadily increased since 1985, whereas for low-income non-SSA it has remained almost stagnant; SSA health expenditures also begun at a much lower spending base than non-SSA. Fig. 2 presents the trends in health spending as a share of GDP in SSA and non-SSA. Additional variables reflecting SSA exceptionalism in the period measured are shown in Table 2. SSA performs worse than non-SSA on all the selected variables: the median GDP per capita is half that of non-SSA; the strength of democracy is nearly half; infant mortality is almost double; and life expectancy is about 15 years lower.

4. Findings

In Table 3, we present the results of our quantitative analyses. These are reported for the entire sample of LICs and for subsamples, controlling for key demographic, economic, and political indicators. Overall, the base models explain between 26 and 34 percent of the variance.

We could not identify a statistically significant relationship between IMF programs and health spending in any of the models for the entire sample of LICs. When we divide the sample into an SSA and a non-SSA group, however, we find important effects of IMF programs. In the non-SSA sample, we find a negative and highly statistically significant relationship between participation in IMF-supported programs and government spending on health. This relationship is positive in Sub-Saharan Africa, but statistically significant only when examining health spending as a share of GDP.

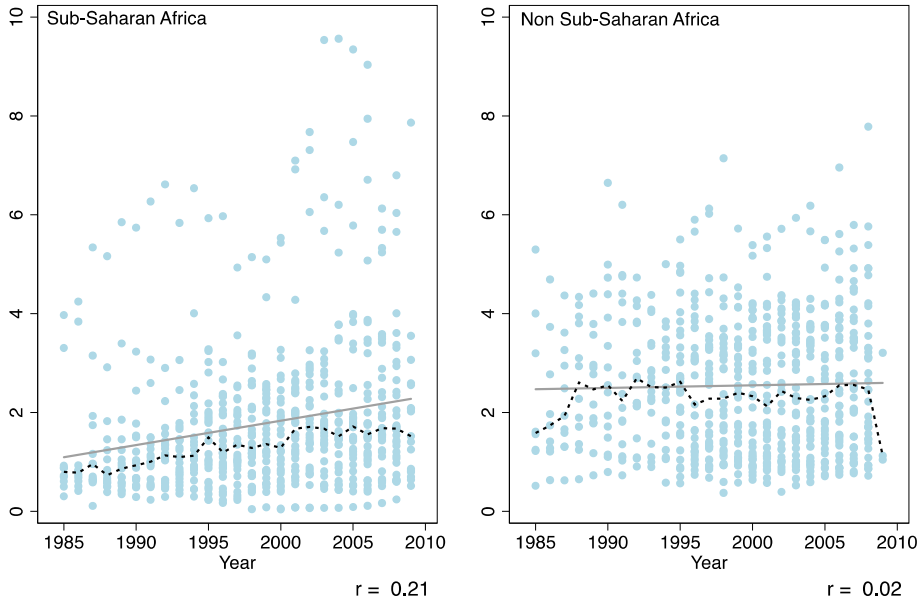

Fig. 2. Public health expenditure as share of GDP in LICs. Solid line: Fitted values; Dotted line: Median values.
Source: Data by the International Monetary Fund (Clements et al., 2013).

Fig. 3 visualizes the effects of an IMF program based on the results, assuming a three-year program. For non-SSA countries, upon commencement of the program a large drop in health spending is observed. The effects then continue for three years after program commencement with diminishing intensity, and cease after that (as the program ends). The relationship for SSA countries is the inverse. A large initial rise is followed by slower rises over the remaining program years.

To take an example based on our results, the coefficients for IMF participation for LICs outside Sub-Saharan Africa (model 3) indicate that Fund programs curb public health expenditures in both the short-term (upon program commencement) and over the long-term (throughout the program duration). Holding everything else constant, when entering a Fund program, upon commencement of an IMF program, health spending as a share of GDP would immediately drop by 1.3 percentage points (coefficient of $\Delta IMFprogram_t$). In an error correction model, the long-run effects of IMF participation can be estimated by dividing the lagged level coefficient ($IMFprogram_{t-1}$) by the negative value of the lagged dependent variable (−0.47), which comes to −1.11 percentage points, the *maximum* size of the cumulative long-term effect. This effect is dispersed over future time periods at a rate of decrease of 47 percent (the value of the coefficient of the lagged dependent variable) per time period. Therefore, if a non-Sub-Saharan African LIC sustains an IMF program for three years, in addition to the short-term effect, ceteris paribus, we would also observe a decrease of 0.52 percentage point after the first year, a further decrease of 0.28 percentage point after the second, followed by a 0.15 percentage point reduction after the third. This does not add up to the full effect as the 'treatment' (IMF program) ceases before the effect has been fully dissipated. In contrast, for the SSA sample (model 2), the relationship is positive both in the short- and long-run, thus Fund programs are associated in with increases in government health spending.

The coefficient of the inverse Mills ratio is positive and statistically significant for the non-SSA sample, indicating that unobserved variables making participation in Fund-supported programs more likely are also associated with higher public health spending. Therefore, analyses of Fund programs and health spending need to account for endogeneity or risk producing misleading results. The dummy variable for the 2000s reaches thresholds of significance for the SSA sample, confirming that the relationship between Fund programs and health expenditures has changed in recent years. Including a dummy variable for the presence of a Poverty Reduction Strategy Paper (PRSP) did not yield statistically significant results, and is not presented here. A number of other control variables also reach thresholds of statistical and substantive significance.

5. Robustness controls

To test for robustness we examined our models in additional ways. We investigated whether our results hold when including additional control variables. First, we examined the same models adding yearly dummy variables (instead of the 2000s dummy); the results did not change. Second, we explored whether our results were robust to augmenting our models. In Web Appendix 5, we present the models augmented with additional politics and health needs variables. For political determinants of spending, we included a dummy variable for left-wing chief executive party orientation, since left-leaning governments are likely to increase social spending (Iversen and Cusack, 2000; Levitt and Snyder, 1995). Further, we added a dummy variable for executive elections, as these years may be marked by rises in spending. For health needs, we included child and maternal mortality rates. Our results did not substantively change. Given the relevance of HIV and malaria for LICs, we also included these two variables in our base regressions: the statistical significance of the IMF coefficients disappeared from all models. However, due to insufficient epidemiological data about a third of the observations were lost compared to the base models.

Third, we examined public health spending per capita as an additional dependent variable. Our results did not substantively change (see Web Appendix 6). Fourth, given the possibility of a 'resource effect' of the IMF via the funds that countries borrow, we controlled for the use of Fund credit as a share of GDP; the results did not change. Finally, we examined whether our findings hold using models investigating levels of public health expenditures (rather than changes in spending, as in the error correction

Table 2
Descriptive statistics for selected variables in low-income countries.

		Mean	Median	SD	Min	Max	N
GDP per capita (constant 2000 US$)	All LICs	794.62	461.20	1027.47	54.51	8845.41	1876
	SSA	438.91	291.94	687.34	54.51	8845.41	920
	non-SSA	1136.94	689.61	1174.25	122.09	6128.87	956
Democracy, range 0–10 (Freedom House/Imputed Polity)	All LICs	4.70	4.33	2.92	0.00	10.00	1965
	SSA	4.00	3.25	2.53	0.25	10.00	953
	non-SSA	5.36	6.07	3.10	0.00	10.00	1012
Mortality rate, infant (per 1000 live births)	All LICs	72.13	72.20	35.66	9.20	166.00	2050
	SSA	93.44	93.80	28.49	20.80	166.00	962
	non-SSA	53.29	50.75	30.36	9.20	163.50	1088
Life expectancy at birth, total (years)	All LICs	57.30	56.84	9.49	26.82	76.76	2013
	SSA	50.48	49.68	6.51	26.82	73.59	962
	non-SSA	63.54	64.35	7.22	40.46	76.76	1051

Note: SSA stands for Sub-Saharan Africa. Between-region independent means t-tests all significant at $p < 0.01$.

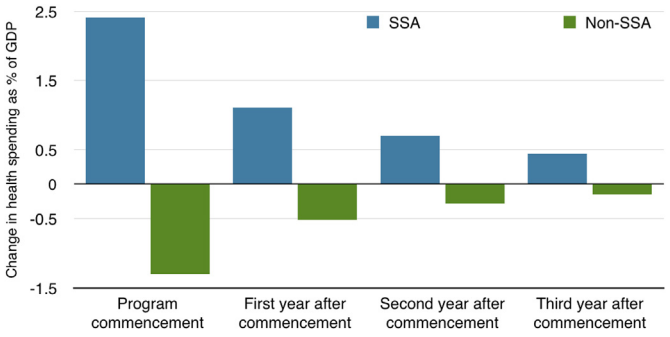

Fig. 3. IMF programs and health spending: Short- & long-term effects. Figure shows the change in health spending as a share of GDP holding everything else constant, based on calculations using the regression coefficients from models 2 and 3 presented in Table 3.

models). The relationships under investigation maintained statistical significance and direction (see Web Appendix 7).

Africa and low-income countries elsewhere. In the case of the former, encouraging results of the quantitative analyses must be tempered by the fact that these countries still spend little on health. The findings for low-income countries outside Sub-Saharan Africa are disheartening and consistent with the claims of the Fund's

Table 3
IMF programs and health spending.

Dependent variable	Health spending as share of GDP			Health spending as share of total government spending		
Model	1	2	3	4	5	6
Sample	All LICs	SSA	Non-SSA	All LICs	SSA	Non-SSA
L. IMF program	0.145 [0.314]	1.114** [0.495]	−0.521** [0.242]	0.024 [1.243]	2.232 [1.712]	−1.486** [0.754]
D. IMF program	0.378 [0.921]	2.412** [1.224]	−1.302* [0.722]	−0.296 [3.496]	4.520 [4.228]	−4.199* [2.266]
L. GDP per cap (log)	0.012 [0.146]	−0.258 [0.193]	0.243 [0.224]	−0.143 [0.537]	−1.000 [0.847]	−0.73 [0.887]
D. GDP per cap (log)	−0.411 [0.308]	−0.482 [0.407]	−0.617 [0.622]	−3.202** [1.420]	−3.779** [1.825]	−2.288 [2.346]
L. Gov't Balance	−0.009* [0.006]	−0.016** [0.007]	−0.035** [0.014]	−0.002 [0.019]	−0.023 [0.022]	−0.043 [0.051]
D. Gov't Balance	−0.010** [0.005]	−0.007 [0.005]	−0.029*** [0.007]	0.036** [0.015]	0.027* [0.014]	0.060* [0.031]
L. High inflation	−0.094 [0.093]	−0.064 [0.118]	−0.05 [0.152]	−0.436 [0.282]	−0.476 [0.393]	−0.279 [0.410]
D. High inflation	−0.105 [0.075]	−0.078 [0.098]	−0.103 [0.119]	−0.557** [0.263]	−0.426 [0.357]	−0.630* [0.370]
L. Negative growth	−0.166* [0.100]	−0.078 [0.115]	−0.177 [0.153]	−0.174 [0.346]	−0.186 [0.447]	0.088 [0.497]
D. Negative growth	−0.066 [0.073]	0.012 [0.081]	−0.135 [0.117]	−0.173 [0.266]	0.023 [0.340]	−0.227 [0.396]
L. Trade	0.003* [0.001]	0.003 [0.003]	0.002 [0.002]	0.011** [0.004]	0.004 [0.008]	0.011* [0.006]
D. Trade	0.002 [0.002]	0.001 [0.003]	0.004 [0.002]	−0.008* [0.005]	−0.012 [0.008]	−0.008 [0.007]
L. Dependency ratio	−0.017 [0.012]	−0.034 [0.022]	−0.005 [0.017]	0.031 [0.042]	0.093 [0.098]	0.015 [0.057]
D. Dependency ratio	0.080 [0.116]	0.052 [0.150]	0.004 [0.149]	0.229 [0.382]	0.657 [0.571]	0.063 [0.470]
L. Urbanization	0.018 [0.014]	0.033 [0.022]	0.006 [0.016]	0.012 [0.039]	0.119 [0.093]	−0.017 [0.044]
D. Urbanization	0.082 [0.133]	−0.1 [0.173]	0.226 [0.185]	−0.304 [0.413]	−0.283 [0.707]	−0.202 [0.536]
L. Democracy	0.003 [0.016]	−0.028 [0.026]	−0.008 [0.022]	0.071 [0.067]	−0.049 [0.090]	0.099 [0.096]
D. Democracy	0.011 [0.023]	−0.032 [0.037]	0.021 [0.026]	−0.014 [0.090]	−0.046 [0.120]	−0.074 [0.140]
L. ODA	0.000 [0.002]	−0.001 [0.003]	−0.001 [0.007]	−0.029** [0.011]	−0.016 [0.011]	−0.091*** [0.035]
D. ODA	0.002 [0.002]	0.001 [0.002]	−0.002 [0.006]	−0.001 [0.009]	0.007 [0.010]	−0.076** [0.032]
Decade: 2000s	0.085* [0.044]	0.132* [0.070]	0.041 [0.055]	0.197 [0.156]	0.384 [0.261]	0.034 [0.205]
Inv. Mills ratio	−0.187 [0.510]	−1.296* [0.686]	0.706* [0.396]	0.312 [1.931]	−2.302 [2.369]	2.387* [1.255]
L. Dependent Variable	−0.394*** [0.079]	−0.375*** [0.083]	−0.468*** [0.099]	−0.387*** [0.073]	−0.323*** [0.079]	−0.540*** [0.090]
Constant	0.243 [1.168]	1.504 [1.843]	−0.912 [1.864]	1.612 [4.578]	−3.939 [7.533]	9.503 [7.962]
Observations	747	364	383	747	364	383
Countries	63	30	33	63	30	33
R^2	0.26	0.27	0.32	0.26	0.26	0.34

Standard errors in brackets; *p < 0.10, **p < 0.05, ***p < 0.01.

In sum, our results hold across the public health spending dependent variables (as share of GDP and total government expenditures, and per capita), and are robust to the inclusion of alternative variables and different estimations of the models.

6. Discussion & conclusions

This study has shown that IMF programs are highly correlated with changes in public health expenditures both in Sub-Saharan

critics. Why are our findings for Sub-Saharan African different?

The IMF has had a crucial role in formulating public policy in most of these countries over the years, often with adverse social consequences (Babb, 2005). One superficial interpretation of our findings would be that the IMF has confronted past mistakes, and enabled countries to safeguard and increase their health expenditures within the framework of its programs. Yet, this reading would overlook that health spending was originally extremely low in these countries. The extent to which the near-constant presence of

the Fund in the region supported or impeded progress on this front therefore needs to be examined not in relation to whether countries spent slightly more than they used to, but whether they spend enough to address pressing health needs. The Fund has been an important stakeholder in efforts to achieve the Millennium Development Goals. One positive development has been the introduction of the Multilateral Debt Relief Initiative as part of the Highly Indebted Poor Country Initiative that links debt relief to progress towards meeting MDG goals (IMF, 2013a). However, the latest available data show that those targets have been missed by a considerable margin: out of the 27 Sub-Saharan countries that participated, 23 did not report sufficient progress under three or four of the four health-related MDG targets (IMF, 2013b), and the Fund has admitted that 'overall global progress on health-related targets has been less than stellar' (IMF, 2014).

We make some general observations concerning the implications of this work for health policy and public health in low-income countries. First, we do not claim that more public health spending is always and necessarily beneficial for health outcomes: what matters is where and how it is spent. For instance, the success of Ugandan HIV-prevention strategies, in contrast to the failure of such strategies in middle-income Botswana, suggests that effective health systems utilizing local knowledge and public support for the fight against disease are essential elements for health promotion and do not necessarily require additional funds (Swidler, 2009). However, we recognize that for countries spending minuscule amounts on health, additional expenditure has the potential to improve the health status of the population (Baldacci et al., 2008).

Second, health systems need not only provision of funds, but also a stable funding environment to operate in. The decline in public health spending in non-Sub-Saharan African countries associated with the existence of a Fund program is particularly worrisome, as these fluctuations in financing can immediately affect the level and quality of services. Last and most importantly, the growing body of work linking IMF adjustment programs and adverse health outcomes (e.g. Baker, 2010; Kentikelenis et al., 2014a, 2014b; Stuckler and Basu, 2009, 2013) offers a sober warning that austerity measures and ill-conceived structural reforms have tangible social costs. As the Khartoum Declaration pointed out 26 years ago, 'a basic test for all stabilization, adjustment and development programs is whether they will improve the human condition from their inception or, on the contrary, worsen it' (United Nations, 1988).

Moving beyond the low-income framework, Fund programs have also been associated with deep health spending cuts in countries at higher levels of economic development (Kentikelenis et al., 2014a, 2011; Reeves et al., 2013). In light of this general experience of borrowing countries, some cursory advice is offered. First, it is important to enhance collaboration between the IMF and other relevant stakeholders, both domestic authorities – crucially, the Ministries of Health – and international agencies – like the World Health Organization, UNAIDS, UNESCO, and the International Labour Organization. While this was a commitment in public statements, more effort is required to achieve a satisfactory level of collaboration. The recent IMF-ILO collaboration on designing social protection floors is encouraging and can be expanded (Deacon, 2013). Second, an internal review into the IMF modus operandi and the intended and unintended consequences of Fund policies on health spending could yield important new knowledge on how to minimize the adverse effects of adjustment policies on sensitive expenditure categories. Finally, the systematic divergence between the findings of authors linked to the IMF and the World Bank and those of independent researchers needs to be acknowledged by the Fund. Academic work has generally identified nuances in the effects of Fund programs: timeframe, geography and politics matter. In contrast, Fund/Bank authors have overwhelmingly advanced blanket explanations that overlook variations. Our analysis provides one instance of this divergence. Relying on the established methodology, our study reaches different conclusions than those of the recent IMF study on social spending (Clements et al., 2013), thereby casting doubts to public assertions of the Fund that 'IMF loans encourage poor countries to raise their health spending' (Rice, 2011). Such findings – and their subsequent promotion in the media – could be seen as attempts to counter criticisms and allay concerns of different stakeholders. However, they may also breed complacency or impede evidence-based policy design.

Examining the relationship between IMF programs and public health spending can provide only partial accounts of how health outcomes are affected because different economic and structural adjustment policies can impact population health in various ways. Future academic inquiries may wish to examine these links by developing more targeted approaches. For example, recent work linked IMF-mandated labor market reforms to declines in wages (Rickard and Caraway, 2014); this can provide inspiration for similar approaches tracing the impact of different Fund-supported policies on specific health outcomes.

What is certain is that socioeconomic change will have many and complex effects on population health (Marmot, 2006). Closely documenting the effects of the international institutions tasked with managing and directing this change not only enhances their accountability but can also inform future policy prescriptions.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.socscimed.2014.12.027.

References

Babb, S.L., 2005. The social consequences of structural adjustment: recent evidence and current debates. Annu. Rev. Sociol. 31 (1), 199–222.
Baker, B.K., 2010. The impact of the International Monetary Fund's macroeconomic policies on the AIDS pandemic. Int. J. Health Serv. 40 (2), 347–363.
Baldacci, E., Clements, B., Gupta, S., Cui, Q., 2008. Social spending, human capital, and growth in developing countries. World Dev. 36 (8), 1317–1341.
Baqir, R., 2002. Social Sector Spending in a Panel of Countries. IMF Working Paper, (WP/02/35).
Bates, R.H., 1981. Markets and States in Tropical Africa: The Political Basis of Agricultural Policies. University of California Press, Berkeley.
Beck, N., Katz, J.N., 1995. What to do (and not to do) with time-series cross-section data. Am. Polit. Sci. Rev. 89 (3), 634–647.
Beck, N., Katz, J.N., 1996. Nuisance vs. substance: specifying and estimating time-series-cross-section models. Polit. Anal. 6 (1), 1–36.
Benson, J.S., 2001. The impact of privatization on access in Tanzania. Soc. Sci. Med. 52 (12), 1903–1916.
Bird, G., Rowlands, D., 2007. The IMF and the mobilisation of foreign aid. J. Dev. Stud. 43 (5), 856–870.
Brady, D., Lee, H.Y., 2014. The rise and fall of government spending in affluent democracies, 1971–2008. J. Eur. Soc. Policy 24 (1), 56–79.
Clements, B., Gupta, S., Nozaki, M., 2013. What happens to social spending in IMF-supported programmes? Appl. Econ. 45 (28), 4022–4033.
Dawson, T.C., 2003, February 5. The IMF did not Force Thailand to Cut Public Health

Spending. Retrieved January 22, 2014, from. http://www.imf.org/external/np/vc/2003/020503.htm.
De Boef, S., Keele, L., 2008. Taking time seriously. Am. J. Political Sci. 52 (1), 184–200.
de Renzio, P., 2005. Scaling up versus Absorptive Capacity: Challenges and Opportunities for Reaching the MDGs in Africa. ODI Briefing Paper, (May).
Deacon, B., 2013. The social protection floor and global social governance: towards policy synergy and cooperation between international organizations. Int. Soc. Secur. Rev. 66 (3–4), 45–67.
Gereffi, G., Fonda, S., 1992. Regional paths of development. Annu. Rev. Sociol. 18, 419–448.
Goldsborough, D., 2006. The Nature of the Debate between the IMF and its Critics. Center for Global Development Working Group on IMF Programs and Health Expenditures Background Paper, (September).
Goldsborough, D., 2007. Does the IMF Constrain Health Spending in Poor Countries? Evidence and an Agenda for Action. Center for Global Development, Washington DC.
Gould, E.R., 2003. Money talks: supplementary financiers and international monetary fund conditionality. Int. Organ. 57 (3), 551–586.
Gupta, S., Dicks-Mireaux, L., Khemani, R., McDonald, C., Verhoeven, M., 2000. Social issues in IMF-supported programs. IMF Occas. Pap. 191.
Huber, E., Mustillo, T., Stephens, J.D., 2008. Politics and social spending in Latin America. J. Polit. 70 (2), 420–436.
IEO, 2003. Fiscal Adjustment in IMF-supported Programs. IMF Independent Evaluation Office, Washington DC.
IMF, 2013a, October 1. Factsheet – the Multilateral Debt Relief Initiative. Retrieved January 29, 2014a, from. http://www.imf.org/external/np/exr/facts/mdri.htm.
IMF, 2013b, December 13. Heavily Indebted Poor Countries Initiative and Multilateral Debt Relief Initiative — Statistical Update. Retrieved January 23, 2014b, from. http://www.imf.org/external/np/pp/eng/2013/121913.pdf.
IMF, 2014, April 7. The IMF and the Millennium Development Goals. Retrieved September 5, 2014, from. https://www.imf.org/external/np/exr/facts/mdg.htm.
Iversen, T., Cusack, T.R., 2000. The causes of welfare state expansion: deindustrialization or globalization? World Polit. 52 (3), 313–349.
Kaufman, R.R., Segura-Ubiergo, A., 2001. Globalization, domestic politics, and social spending in Latin America: a time-series cross-section analysis, 1973–97. World Polit. 53 (4), 553–587.
Kentikelenis, A., Karanikolos, M., Papanicolas, I., Basu, S., McKee, M., Stuckler, D., 2011. Health effects of financial crisis: omens of a Greek tragedy. Lancet 378 (9801), 1457–1458.
Kentikelenis, A., Karanikolos, M., Reeves, A., McKee, M., Stuckler, D., 2014a. Greece's health crisis: from austerity to denialism. Lancet 383 (9918), 748–753.
Kentikelenis, A., King, L., McKee, M., Stuckler, D., 2014b. The International Monetary Fund and the Ebola Outbreak. The Lancet Glob. Health 1–2. http://dx.doi.org/10.1016/S2214-109X(14)70377-8.
Levitt, S.D., Snyder, J.M., 1995. Political parties and the distribution of federal outlays. Am. J. Polit. Sci. 39 (4), 958–980.
Loewenson, R., 1995. Structural adjustment and health policy in Africa. Int. J. Health Serv. 23 (4), 717–730.
Lu, C., Schneider, M.T., Gubbins, P., Leach-Kemon, K., Jamison, D., Murray, C.J., 2010. Public financing of health in developing countries: a cross-national systematic analysis. Lancet 375 (9723), 1375–1387.
Marmot, M., 2006. Health in an Unequal World. Royal College of Physicians, London.
Musgrove, P., 1987. The economic crisis and its impact on health and health care in Latin America and the Caribbean. Int. J. Health Serv. 17 (3), 411–441.
Nooruddin, I., Simmons, J.W., 2006. The politics of hard choices: IMF programs and government spending. Int. Organ. 60 (4), 1001–1033.
Nooruddin, I., Simmons, J.W., 2009. Openness, uncertainty, and social spending: implications for the globalization—welfare state debate. Int. Stud. Q. 53 (3), 841–866.
Ooms, G., Schrecker, T., 2005. Expenditure ceilings, multilateral financial institutions, and the health of poor populations. Lancet 365 (9473), 1821–1823.
Oxfam, 1995. The Oxfam Poverty Report. Oxfam, Oxford.
Pitt, M., 1993. Analyzing human resource effects: health. In: Demery, L., Ferroni, M.A., Grootaert, C. (Eds.), Analyzing the Effects of Policy Reforms. World Bank, Washington DC.
Reeves, A., Basu, S., McKee, M., Marmot, M., Stuckler, D., 2013. Austere or not? UK coalition government budgets and health inequalities. J. R. Soc. Med. 106 (11), 432–436.
Rice, G., 2011, February 1. IMF Loans Encourage Poor Countries to Raise Their Health Spending, not Cut it. The Guardian. Retrieved September 6, 2014, from. http://www.theguardian.com/commentisfree/2011/feb/01/imf-loans-poor-countries-health-spending.
Rickard, S.J., Caraway, T.L., 2014. The International Politics of Austerity: the Puzzling Case of Public Sector Reforms. Retrieved September 4, 2014, from. http://www.cidcm.umd.edu/workshop/papers/Rickard_and_Caraway.pdf.
Rowden, R., 2009. The Deadly Ideas of Neoliberalism: How the IMF Has Undermined Public Health and the Fight against AIDS. Zed Books, London.
Rudra, N., 2008. Globalization and the Race to the Bottom in Developing Countries: Who Really Gets Hurt? Cambridge University Press, Cambridge.
Sen, K., Koivusalo, M., 1998. Health care reforms and developing countries—a critical overview. Int. J. Health Plan. Manag. 13 (3), 199–215.
Shelton, C.A., 2007. The size and composition of government expenditure. J. Public Econ. 91 (11–12), 2230–2260.
Sridhar, D., Woods, N., 2010. Are there simple conclusions on how to channel health funding? Lancet 375 (9723), 1326–1328.
Stasavage, D., 2005. Democracy and Education spending in africa. Am. J. Political Sci. 49 (2), 343–358.
Stiglitz, J.E., 2002. Globalization and its Discontents. W. W. Norton & Company, New York.
Stuckler, D., Basu, S., 2009. The International Monetary Fund's effects on global health: before and after the 2008 financial crisis. Int. J. Health Serv. 39 (4), 771–781.
Stuckler, D., Basu, S., 2013. The Body Economic: Why Austerity Kills. Basic Books, New York.
Stuckler, D., Basu, S., McKee, M., 2010. International Monetary Fund and aid displacement. Int. J. Health Serv. 41 (1), 67–76.
Swidler, A., 2009. Responding to AIDS in Sub-Saharan Africa: culture, institutions, and health. In: Hall, P.A., Lamont, M. (Eds.), Successful Societies: How Institutions and Culture Affect Health. Cambridge University Press, Cambridge, pp. 128–150.
Summers, L., Pritchett, L.H., 1993. The structural-adjustment debate. Am. Econ. Rev. 83 (2), 383–389.
Jean K. Thiesen, 1994. A Study of the Effects of Structural Adjustment on Education and Health in Africa. In Economic Justice in Africa: Adjustment and Sustainable Development, eds. George W Sheperd and Karamo N M Sonko. Westport: Greenwood Press, 79-116.
Toye, J., 1994. Structural adjustment: context, assumptions, origin and diversity. In: van der Hoeven, Rolph, van der Kraaij, Fred (Eds.), Structural Adjustment and beyond in Sub-Saharan Africa: Research and Policy Issues. Heinemann, London, pp. 18–35.
Turshen, M., 1999. Privatizing Health Services in Africa. Rutgers University Press, New Brunswick.
United Nations, 1988. The Khartoum Declaration – International Conference of the Human Dimension of Africa's Economic Recovery and Development. United Nations, Addis Ababa.
United Nations, 2001, April 27. Abuja Declaration on HIV/AIDS, Tuberculosis and Other Related Infectious Diseases. Retrieved January 24, 2014, from. http://www.un.org/ga/aids/pdf/abuja_declaration.pdf.
Van der Gaag, J., Barham, T., 1998. Health and health expenditures in adjusting and non-adjusting countries. Soc. Sci. Med. 46 (8), 995–1009.
van der Hoeven, R., Stewart, F., 1993. Social development during periods of structural adjustment in Latin America. ILO Occas. Pap. 18, 1–32.
Vreeland, J.R., 2003. The IMF and Economic Development. Cambridge University Press, Cambridge.
Wagner, A., 1994. Three extracts on public finance. In: Musgrave, R.A., Peacock, A.T. (Eds.), Classics in the Theory of Public Finance. Palgrave Macmillan, London.
Woods, N., 2006. The Globalizers: the IMF, the World Bank, and Their Borrowers. Cornell University Press, Ithaca.
World Bank, 1989. Sub-saharan Africa: From Crisis to Sustainable Growth – a Long-term Perspective Study. World Bank, Washington DC.
World Bank, 1994. Adjustment in Africa: Reforms, Results, and the Road Ahead. World Bank, Washington DC.