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Globalization and health equity: The impact of structural adjustment programs on developing countries

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ABSTRACT

Among the many drivers of health inequities, this article focuses on important, yet insufficiently understood, international-level determinants: economic globalization and the organizations that spread market-oriented policies to the developing world. One such organization is the International Monetary Fund (IMF), which provides financial assistance to countries in economic trouble in exchange for policy reforms. Through its 'structural adjustment programs,' countries around the world have liberalized and deregulated their economies. We examine how policy reforms prescribed in structural adjustment programs explain variation in health equity between nations—approximated by health system access and neonatal mortality. Our empirical analysis uses an original dataset of IMF-mandated policy reforms for a panel of up to 137 developing countries between 1980 and 2014. We employ regression analysis to evaluate the relationship between these reforms and health equity, taking into account the non-random selection and design of IMF programs. We find that structural adjustment reforms lower health system access and increase neonatal mortality. Additional analyses show that labor market reforms drive these deleterious effects. Overall, our evidence suggests that structural adjustment programs endanger the attainment of Sustainable Development Goals in developing countries.

1. Introduction

The Sustainable Development Goals (SDGs) represent a policy agenda for enabling universal health coverage and improving population health. At their core is a drive to reduce global health inequities (Marmot and Bell, 2018), the 'systematic differences in health, between and within countries, that are avoidable by reasonable action' (Ruckert and Labonté, 2012, p.267). In developing countries, these inequities are most visible on child health, itself a reflection of countries' efforts (or lack thereof) to address the social determinants of health (CSDH, 2008, p.50–51). Notwithstanding improvements over the last thirty years (UNICEF, 2017), in 2014, 43.2 per 1000 children in developing countries died before the age of five—almost six times as many as in high-income countries (WDI, 2016). Within the developing world, there is wide variation, too. For instance, infant mortality rates in both Uzbekistan and Lesotho were slightly above 90 per 1000 children in 1980. Over the subsequent 35 years, this figure declined by 56.8 to 35.0 in Uzbekistan, whereas infant mortality in Lesotho decreased by less than one-third to 70.5 (WDI, 2016).

What accounts for uneven progress in improving health equity between countries? A large body of scholarship investigates the social determinants of health—the conditions 'in which people are born, grow, live, work, and age' (Marmot and Bell, 2012, p.S4). Such studies focus on the impact of income and public policies on health equity (Bambra et al., 2009; Clark, 2011; CSDH, 2008; Karanikolos and Kentikelenis, 2016; O'Hare et al., 2013; Pickett and Wilkinson, 2015; Ruckert and Labonté, 2012), often through case studies. Yet, policies are rarely the sole products of national-level decisions. The organizational apparatus of globalization—layers of state, intergovernmental, or non-governmental organizations involved in the design and provision of health services—has had a key role in shaping the capacity of countries to address health equity (Labonté and Schrecker, 2007; Tichenor and Sridhar, 2017). This article therefore emphasizes the political-economic determinants of health, including the role of

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international organizations, in explaining differences in health equity between countries (Beckfield and Krieger, 2009; Forster et al., 2018; Ruckert and Labonté, 2017; Schrecker and Bambra, 2015; Shandra et al., 2011).

To examine these issues, we focus on one particularly controversial dimension of globalization: structural adjustment programs administered by the International Monetary Fund (IMF). This organization provides countries with loans in exchange for wide-ranging reforms (known as 'conditionality'), which—in turn—shape the political-economic, fiscal, and administrative parameters within which policies are developed (Babb and Kentikelenis, 2018; Kentikelenis and Babb, 2019; Kentikelenis and Seabrooke, 2017). Structural adjustment programs have been ubiquitous: between 1980 and 2014, 109 out of 137 developing countries entered at least one program, and low-income developing countries—the poorest nations in terms of GDP per capita—have on average been under IMF tutelage almost every second year. While the precise content of these reforms varies by country, the overall orientation of IMF programs is towards increasing the scope of the market; for example, by removing labor market regulations (Stiglitz, 2002). This set of market-oriented policies has long been argued to impact health (e.g., Kentikelenis, 2017; Pfeiffer and Chapman, 2010; Stubbs and Kentikelenis, 2017; Stubbs and Kentikelenis, 2018a; Thomson et al., 2017). However, cross-national empirical investigations on how these reforms impact health equity in developing countries remain limited (for exceptions, see Beckfield et al., 2013; Daoud and Reinsberg, 2019); our study takes on this task.

We examine two health equity measures that are available over time, enabling inferences based on cross-national panel data analysis: health system access, a key determinant of equitable health outcomes (Bishaia et al., 2003); and average neonatal mortality rates, as the neonatal period is highly responsive to interventions in health care access and quality (Nolte et al., 2000; UNICEF, 2014). Together, these indicators approximate health equity in the developing world, reflecting differential exposure and vulnerability to health risks (Diderichsen et al., 2001, p.14). Our analyses also use newly available data on IMF programs for the period 1980 until 2014 (Kentikelenis et al., 2016). We employ regression analysis that corrects for non-random selection into IMF programs and conditions on a panel of up to 137 developing countries to evaluate the relationship between IMF-mandated policies and health equity. Further, we innovate by isolating structural adjustment reforms from other components of IMF programs, such as financial resources and technical assistance.

We find that market-oriented policies mandated by the IMF worsen health system access and increase neonatal mortality in borrowing countries. Subsequent analyses indicate that labor market reforms partly explain these deleterious effects on health equity. These findings are a far cry from the purported commitment of the IMF—broadcast in high-level speeches and factsheets (IMF 2017)—to aiding developing countries' progress towards achieving the SDGs.

2. Structural adjustment, health equity, and the IMF

2.1. The scope of structural adjustment

The term 'structural adjustment' refers to policy reforms mandated by international financial institutions—the IMF, the World Bank, and regional development banks—in exchange for financial resources. These reforms typically concentrate on four broad prescriptions: stabilization, liberalization, deregulation, and privatization of the economy (Babb and Kentikelenis, 2018; Kentikelenis and Babb, 2019). Yet, despite homogeneity in orientation, structural adjustment programs have been heterogeneous in their exact policy prescriptions. Box 1 discusses the evolution of IMF conditionality.

Structural adjustment has several implications for health equity. First, stabilization entails fiscal, monetary, and exchange rate policies that aim to restore balance-of-payments, promote currency stability, and control inflation. However, currency devaluation following exchange rate liberalization can increase the costs of imported foods to levels unaffordable for the poorest households, thereby deteriorating child health and nutrition (Handa and King, 2003). Alternatively, fiscal consolidation—or 'austerity'—can result in the removal of food subsidies and lower social spending, which challenges poor households to meet basic consumption needs and thereby endangers health (Ortiz et al., 2011). Austerity has also been linked to higher income inequality due to cuts in public wages (Agnello and Tavares, 2014; Ball et al., 2013; Forster et al., 2019), resulting in health problems linked to amplifying social gradients (Pickett and Wilkinson, 2015).

Second, trade liberalization entails reductions in tariffs and non-tariff barriers to trade in order to facilitate integration into the global economy. Although such measures potentially improve health equity through poverty reduction if they stimulate economic growth (Dollar et al., 2016; Dollar and Kraay, 2002), gains from trade liberalization are typically distributed asymmetrically to skilled labor rather than poor households (e.g., Attanasio et al., 2004). Recent research also finds no universal relationship between trade liberalization and child mortality in developing countries (Barlow, 2018), but associations between increased economic openness and both higher economic insecurity and unhealthier diets (Barlow et al., 2017; McNamara, 2017; Mendez Lopez et al., 2017).

Third, deregulation involves allowing market forces to operate with fewer regulatory requirements set by state bodies. Its proponents argue that the market, rather than the public sector, is best equipped to allocate resources efficiently (Cottarelli, 2010). Yet, economic deregulation typically favors the interests of large corporations—e.g., through changes in the tax code—neglecting the needs of small-scale companies and the labor force (Hilson and Potter, 2005; Pacheco, 2006). Reforms related to the deregulation of labor markets are discussed separately below.

Fourth, privatization of government resources and services is anticipated to improve economic performance and raise public revenues in the near-term. However, the sale of state-owned enterprises reduces long-term capacity for governments to generate income, potentially hampering investments in social services (Shandra et al., 2010). In addition, privatization of health services has been linked to reduced quality and efficiency of health services (Baru, 2003; Homedes and Ugalde, 2005).

These reforms differentially impact strata of the population, leading to gendered or ethnic consequences (Kentikelenis, 2017). Evidence is growing that structural adjustment disproportionately affects women and children (Coburn et al., 2015a, 2015b; Pandolfelli et al., 2013; Shandra et al., 2011; Sommer et al., 2015; Thomson et al., 2017). In the absence of protective policies by the government, the most vulnerable are likely to face adverse health consequences of structural adjustment. Thus, we expect IMF-mandated reforms to undermine health equity. Apart from these direct pathways linking structural adjustment to health equity, IMF programs can indirectly affect health equity between developing countries. For instance, state capacity moderates the relationship between IMF reforms and health equity because it influences the effectiveness of borrowing governments to implement health policies (Reinsberg et al., 2018, 2019a). In this article, we only focus on direct pathways linking IMF programs to health equity.

2.2. Structural adjustment and labor

IMF lending arrangements have frequently sought to reform employment and working conditions, a key social determinant of health (Bambra, 2011; Marmot and Wilkinson, 2006; Schrecker, 2009). Examples of these labor market reforms include wage and employment limits, restructuring of pensions and social security, and deregulation of labor markets. Accordingly, a range of adverse labor market outcomes are linked to IMF programs (Caraway et al., 2012; Reinsberg et al., 2019b; Rickard and Caraway, 2018; Stubbs et al., 2017a; Vreeland,

Box 1
The Evolution of IMF Conditionality

In 1944, the IMF was established with a mandate to maintain global financial stability and, towards this end, would provide financial support to countries facing balance-of-payments crises. Initially, lending programs included only quantifiable macroeconomic targets (e.g., ceilings on government expenditure). Against a background of debt crises, the IMF expanded its original mandate in the 1980s to incorporate detailed and far-reaching reforms that aimed to transform the underlying structure of borrowing economies (Babb and Kentikelenis, 2018; Kentikelenis and Babb, 2019; Pfeiffer and Chapman, 2010). These 'structural adjustment programs' achieved notoriety for requiring low- and middle-income countries to implement free-market policies (Babb and Kentikelenis, 2018). Following extensive criticism after its handling of the late 1990s Asian financial crisis, the IMF claimed to have transformed its lending operations to incorporate 'flexible' policy design, 'streamlined' conditionality, 'pro-poor' orientation, and borrowing-country 'ownership' (IMF, 2009). However, recent studies question the degree to which the IMF's advertised changes to conditionality have been put into practice (Kentikelenis et al., 2016; Nunn and White, 2016), and highlight the continuing application of conditionality and its free-market orientation across time and space (Babb and Carruthers, 2008; Kentikelenis et al., 2016; Labonté and Stuckler, 2016; Pfeiffer and Chapman, 2010; Ruckert and Labonté, 2012).

2003). In Table 1, we describe the main pathways through which labor market conditionality may impact health equity. The table is not exhaustive but indicative and based on these pathways, we expect greater health inequities in countries with higher labor market conditionality.

In addition, components of IMF lending outside of labor market conditionality may influence labor market-related outcomes. For instance, privatization is often associated with higher unemployment (Nellis, 2007). Alternatively, trade liberalization exposes domestic industries to international competition, potentially undermining labor rights in developing countries (Mosley and Uno, 2007). Thus, the IMF's impact on employment and working conditions remains manifold, possibly with complex, unintended consequences.

3. Research design

3.1. Variables

We investigate the effects of IMF intervention on health equity over the period 1980 to 2014 for 137 low- and middle-income countries (World Bank country-classification). Web Appendix A lists countries included in the study. In the absence of internationally comparable data on health equity (Beckfield et al., 2013; Grimm, 2011), we use a set of indirect measures. First, we consider health system access, which is associated with more equitable health outcomes (Bishaia et al., 2003). Our health system access variable is from the 2017 Global Burden of Disease Study. It was derived from estimates of antenatal care coverage, DTP3 immunization, measles immunization, hospital beds, in-facility delivery coverage, and skilled birth attendance coverage. These estimates were log-transformed and normalized to have mean zero and standard deviation of one The resultant vectors were then processed using principal component analysis to generate a single summary vector (Global Burden of Disease Study, 2018)—discussed in detail in Web Appendix B. We rescale the measure to range from 0 to 10, with a higher number indicating better health system access. The mean for our sample is 5.34 with a standard deviation of 1.72.

Second, following earlier studies on the socio-political determinants of health (Beckfield and Krieger, 2009), we examine cross-national variation in average neonatal mortality rates (WDI, 2016). A neonatal death is defined as death during the first 28 days of life. Neonatal mortality is highly responsive to health care access and quality, and also determined by the socio-economic characteristics of the mother (Nolte et al., 2000; UNICEF, 2014). The minimum and maximum number of neonatal deaths per 1000 live births in our sample is 1.9 and 73.1, respectively, with mean 24.85 and standard deviation 14.06. In robustness checks, we also consider infant, child, and maternal mortality rates. Taken together, these variables capture important dimensions of health equity.

In order to measure structural adjustment in general, and labor market conditionality in particular, we use newly available data on IMF programs (Kentikelenis et al., 2016). Based on coding of original loan documents between the IMF and borrowing countries, we employ two measures of IMF exposure simultaneously. First, our models include a binary IMF indicator, which is equal to 1 if there has been an IMF program in effect for at least five months in a given year, and 0 otherwise (Dreher, 2006). This threshold ensures that only those arrangements are covered that were in effect over a substantive period of the year in question (the average length of an IMF program in our sample is 25.6 months). In robustness checks, we relax the threshold to include programs active at any point in the year; we also employ a stricter threshold of 12 months. Second, we approximate the intrusiveness and stringency of conditionality by the number of conditions specified in an IMF program (Stubbs et al., 2018). In robustness checks, we discount IMF conditions for any interruption period of a program review to account for situations where countries may fail to carry out the prescribed reforms. The inclusion of both IMF measures allows us to isolate the effect of structural adjustment. While the binary variable represents aspects of an IMF program beyond conditionality—such as financial resources, technical assistance, and any catalytic role on foreign aid (Stubbs et al., 2016)—the number of conditions captures variation in policy reforms across countries and time.

Health inequities in a cross-national context are also a function of differences in national income, education, gender, and ethnicity (Beckfield et al., 2013). Our baseline control variables thus include a measure of education based on average years of schooling. Schooling empowers individuals, so countries with better levels of education should have higher health equity. In addition, we control for the proportion of women in the population and ethnic fractionalization—combining ethnic and linguistic characteristics of the population (Quality of Governance Database 2016)—to capture demographic features that are sources of gender and racial inequities (Beckfield et al., 2013). Finally, we include explanatory variables for the political context of health (Navarro and Shi, 2001), namely the orientation of the leading government party (Cruz et al., 2016) and an indicator of the level of democracy (Quality of Governance Database, 2016). Following scholarship on these topics, we expect that left governments in power and democracies—both indicated by higher values—take concerns of health equity more seriously.

In robustness checks, we include additional control variables. First, we control for the Gini coefficient of disposable income (Solt, 2016), as income inequality has been widely discussed as a contributor to health inequity (Beckfield, 2004; Pickett and Wilkinson, 2015). Second, we add the natural logarithm of GDP per capita (Clark, 2011; O'Hare et al., 2013) as an indicator of the level of development—and by extension—the likely stage in the epidemiological transition. We omit this variable in the baseline model due to its high correlation with education. Third, we account for trade—imports and exports as a percentage of GDP—and the Chinn-Ito Index of financial openness (Chinn and Hiro, 2006), both reflecting key elements of economic globalization (Labonté and Schrecker, 2007). Further, to control for domestic fiscal policy, we include public health expenditure as a share of total health expenditure (Daoud and Reinsberg, 2019). Finally, we account for HIV prevalence because the AIDS epidemic predicts changes in mortality between

Table 1
Labor market conditionality and health equity.

Labor Market Conditionality	Expected Direct Consequence	Potential Impact on Health Equity
Limits or cuts to wages Examples from IMF programs: ● Cambodia in 1995: '[a]void increase[s] in civil service wage rates' (IMF, 1995, p.55) ● Panama in 1996: '[s]ubmit draft legislation (…) that replaces the special labor laws, which grant automatic wage increases to 53 percent of civil servants' (IMF, 1996a, p.36).	Stagnant or lower incomes	Inability to pay for private health, which exacerbates health inequities since health expenditure of low-income households is most responsive to changes in wages. Psychosocial hazards can deteriorate mental health among individuals in vulnerable situations because of their reliance on wages as main source of income.
Reduction in the workforce Examples from IMF programs: ● Honduras in 1994: '[r]eduction of employment in the public sector by 500, 1500, and 2000' in March, June, and December 1995, respectively (IMF, 1994, p.19) ● Moldova in 2008: '[r]educe public employment by 3000 people' (IMF, 2008, p.72)	Unemployment	Inability to pay for private health, which exacerbates health inequities since health expenditure of low-income households is most responsive to changes in wages. Decline in self-esteem and status loss cause psychological distress and deteriorate health. Inequities widen when dismissals disproportionately affect unskilled labor. Isolation and weakening of social ties deteriorate psychological well-being. Inequities widen when dismissals disproportionately affect unskilled labor.
Pension and social security systems Examples from IMF programs: ● Georgia in 1996: '[r]aise the retirement age for persons not yet retired [by five years] to 65 years for men and 60 years for women' (IMF, 1996b, p.15) ● Kyrgyz Republic in 2000: '[r]educe early retirement privileges and special pensions' (IMF, 2000, p.80)	Increased uncertainty pertaining to retirement and social security	Financial insecurity disproportionately affects individuals in vulnerable situations because they rely the most on public social security. Increasingly, older people in developing countries are exposed to health risks without caregivers, e.g., due to rural-urban migration. Limited pension schemes amplify vulnerability and thus health inequities.
Workplace regulations Examples from IMF programs: ● Niger in 1986: 'redefined the legal status of employees of public enterprises, separating them from the civil service' (IMF, 1986, p.36) ● Bulgaria in 2006: '[a]greement with social partners to increase work time flexibility by raising the legal limits on maximum working hours, (…) and expanding the reasons for work outside regular hours' (IMF, 2006, p.86).	Greater insecurity due to reforms to working conditions	Decline in autonomy causes psychosocial distress due to reduced self-esteem and status loss. Such job strain has been linked to cardiovascular diseases in men, thereby affecting gendered inequities. Psychosocial hazards lead to poor physical and mental health due to insecure work, which is most prevalent in occupations of lower socio-economic status, as well as among women and older workers.

Source: Authors, drawing on CSDH 2008; EMCONET 2007; Forster et al., (2018); Green (2009); Marmot (2004); Marmot and Wilkinson (2006); Parker and Wong (1997); Ruckert and Labonté (2012); Virtanen et al., (2013).

countries (Austin and McKinney, 2012; Clark, 2011). The inclusion of the additional variables corresponds to a more stringent test of the impact of IMF programs, as they close certain pathways that link structural adjustment to health equity. Web Appendices C, D, and E provide definitions and sources, summary statistics, and a correlation matrix of the variables, respectively.

3.2. Estimation techniques

In methodological terms, we consider an IMF program as a 'treatment,' applied over a certain number of years. However, the allocation and design of this treatment is not random: countries that select into IMF programs differ from those that do not, along economic and political parameters like levels of foreign reserves or debt (Vreeland, 2003). Further, lending programs with borrowing countries that have democratic institutions tend to involve less conditionality (Stone, 2008). These forces are observable and can be included as control variables. By contrast, other determinants of IMF programs—e.g., political will (Vreeland 2003; Stone 2008)—are unobservable. Failure to account for such factors that are correlated with our health equity measures causes regression analysis to be biased. In particular, the assumption that the error term—reflecting, *inter alia*, the unobserved variable—is distributed independently of the regressors is violated.

To address this concern of endogeneity, we employ an instrumental variables approach. A valid instrument predicts IMF participation and the number of conditions, respectively ('relevance' criterion), but must not be correlated with health equity except through the IMF variable of interest ('exclusion' criterion). We construct compound instruments as the interaction of the number of countries with an IMF program in a given year—approximating the Fund's budget constraint (Vreeland 2003)—and the country-specific mean of IMF program participation or number of conditions over the sample period, respectively (Lang, 2016; Stubbs et al., 2018). Web Appendix F offers detailed discussion of this instrumentation strategy.

We argue this instrument is valid. The relevance criterion is satisfied because in times of scarce resources the IMF signs fewer loan agreements (Vreeland, 2003), and assigns a higher number of conditions to borrowing countries (Dreher and Vaubel, 2004; Lang, 2016; Stubbs et al., 2018). The exclusion criterion likely holds because the Fund's budget constraint—determined independently of a given country—affects health equity only through the IMF measure of interest, conditional on a country's mean exposure to IMF programs, the controls, and year and country fixed effects.

We implement this identification strategy using maximum likelihood estimation over a system of three equations (Stubbs et al., 2018):

$$\hat{IMF}_{it} = \alpha_0 + \alpha_1(\overline{IMF_i} \times Budget_t)_{t-1} + \alpha_2{'}X_{it-1} + \gamma'Z_{it-1} + \rho_i + \nu_t \quad (1)$$

$$\hat{Cond}_{it} = \pi_0 + \pi_1(\overline{Cond_i} \times Budget_t)_{t-1} + \pi_2{'}X_{it-1} + \mu_i + \nu_t \quad (2)$$

$$Y_{it} = \beta_0 + \beta_1\hat{IMF}_{it-1} + \beta_2\hat{Cond}_{it-1} + \beta_3{'}X_{it-1} + \mu_i + \nu_t + \varepsilon_{it} \quad (3)$$

where i denotes a country and t a year. Equation (3) is the outcome equation, where we regress our dependent variables on the predicted values for IMF program participation and conditionality, alongside the control variables, X. The model includes country fixed effects, μ, which control for time-invariant characteristics of a given country such as colonial legacy or initial institutional endowments. In addition, year fixed effects, υ, absorb external shocks that affect health equity across all nations, such as the recent global financial crisis. Any effect of IMF arrangements and the controls on health equity are unlikely to materialize instantaneously. To allow for a delayed effect, we lag the explanatory variables by one period. We cluster standard errors at the country level.

Equation (1) is a probit model explaining IMF program participation as a function of the lagged compound instrument, $\overline{IMF} \times Budget$, the vector of controls from the outcome equation, X, and a vector of lagged explanatory variables specific to selection into IMF programs, Z. Economic controls are GDP per capita, GDP growth, reserves, and current account balance (Steinwand and Stone, 2008). Further, we include a variable for past IMF participation, as countries previously under an IMF program are more likely to sign agreements in the future (Bird et al., 2004). Finally, we include political variables for executive and legislative elections since these influence IMF programs as well (Rickard and Caraway, 2014). We further include regional fixed effects, ρ, and year fixed effects, υ.

Equation (2) instruments for the number of conditions using the compound instrument, $\overline{Cond} \times Budget$, and includes the vector of lagged explanatory variables from Equation (3), X, country fixed effects, μ, and year fixed effects, υ. Initially, we include the total number of conditions to reflect all structural adjustment reforms mandated by the IMF. Then, we focus on labor market conditionality, where we instrument for both labor market reforms and the number of remaining conditions separately. Failure to account for all reforms incorporated in IMF programs causes omitted variable bias, since labor market conditionality would pick up the effects of other conditions due to collinearity.

Table 2
Structural adjustment and health equity.

Dependent Variable	Health system access	Mortality rate, neonatal
Specification	1	2
L. IMF program (binary)	−0.0072 [0.0594]	0.2635 [0.5614]
L. Total conditions	−0.0146** [0.0058]	0.0641** [0.0327]
L. Education	0.9086* [0.4711]	−0.7643 [3.9194]
L. Female population	0.1257 [0.0923]	0.8433 [0.7731]
L. Ethnic fractionalization	0.7194*** [0.2392]	11.8290*** [2.6681]
L. Government orientation	−0.0075 [0.0262]	0.0843 [0.2137]
L. Democracy	0.0165 [0.0173]	−0.3268* [0.1802]
N	2238	2183
Country fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
F-statistic IMF program	146.25	160.18
F-statistic total conditions	30.50	35.33

Notes: F-tests are Kleibergen-Paap Wald statistics for compound instruments. Cluster robust standard errors in brackets. *p < 0.10, **p < 0.05, ***p < 0.01.

4. Results

Our baseline analyses in Table 2 indicate that across both outcome variables, the effect of the binary IMF variable—which incorporates financial resources, technical assistance, and any catalytic role on foreign aid flows—is insignificant. Yet, structural adjustment impacts the two health equity measures. Each additional policy reform mandated by the IMF lowers health system access, on average, by 0.0146 (Model 1). At the mean number of conditions, 32.17, this translates into a decrease of 0.47, all else constant. This effect corresponds to a decline of 2.16 at the maximum number of conditions of 148. In more concrete terms, Comoros—a country near the average of our sample's health system access indicator in 2010—would witness a decline in health system access to its 2002 level if it participates in an average IMF program. At the maximum number of conditions, the development would bring health system access in Comoros considerably below its 1980 level, *ceteris paribus*.

Further, we find that each additional condition increases the neonatal mortality rate, on average, by 0.0641 (Model 2). This amounts to 2.06 additional deaths per 1000 living births for an average IMF program, and corresponds to an increase of 9.49 at the maximum number of conditions, all else equal.

The majority of the control variables are insignificant. This is not surprising because of small year-to-year variation in these

macroeconomic indicators, inclusion of time and country fixed effects, and reporting of more stringent country-clustered standard errors. As expected, countries with higher levels of education tend to have better access to health services and lower neonatal mortality rates, although we cannot reject the null hypothesis of no relationship at standard thresholds of statistical significance. Further, the implications of the demographic composition of countries for health equity allow for multiple interpretations. The proportion of women in the population and ethnic fractionalization are positively related to both health system access and neonatal mortality, although only the coefficient on ethnic fractionalization is statistically significant. The former is consistent with accounts that racial or ethnic diversity may be a source of health inequity (e.g., Beckfield et al., 2013; Kawachi et al., 2005). By contrast, the latter could reflect that some states support inclusive public policies to accommodate multiple ethnic identities (Kymlicka and Banting, 2006). Alternatively, ethnic fractionalization may simply pick up the effect of income due to collinearity—the coefficient turns negative in certain robustness analyses with GDP per capita as an additional control. Finally, the estimate of the coefficients on the political controls—government orientation and democracy—are close to zero, except that neonatal mortality is lower in more democratic countries, which is consistent with previous analyses. Overall, the explanatory variables capture important cross-national variation in health equity. Thus, we consider the model specifications to be appropriate. In addition, diagnostic statistics indicate our compound instruments are strong, as suggested by Kleibergen-Paap F-statistics (Staiger and Stock, 1997). The results of the first stage of our baseline analyses—reported in Web Appendix G—are consistent with previous work (Kentikelenis et al., 2015; Vreeland, 2003).

Next, we investigate labor market reforms to test the pathways outlined. Graph 1 depicts the evolution of these reforms. Of all IMF programs during the period considered, 34 percent include at least one condition on labor markets. At their peak, more than 60 percent of IMF programs each year entailed such conditionality. Yet, even in 2014, almost one in five IMF programs includes at least one labor market reform.

The estimates in Table 3 show that labor market reforms lower health system access by 0.1955 for each additional condition (Model 3), *ceteris paribus*. The mean number of labor conditions for IMF programs is 1.11, and the mandated reforms range from 0 to 13, thus translating into a mean decrease of 0.22 and a maximum reduction of 2.54. Graph 2 depicts the marginal plot with the predicted values of this outcome variable and the 95 percent confidence interval.

In the absence of an IMF program, our models predict a value of 5.71 for health system access (slightly above the mean). For countries with IMF programs, the estimated value is 5.69, which subsequently decreases to 3.15 as the number of labor market reforms increases. The difference of 2.54 is greater than one standard deviation in the health system measure (1.725). However, the estimate of the marginal effect becomes less precise as the number of conditions increases.

Table 3
Labor market reforms and health equity.

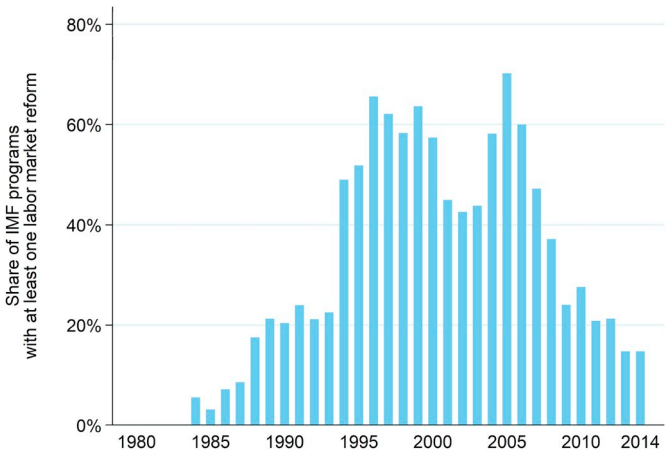
Dependent Variable	Health system access	Mortality rate, neonatal
Specification	3	4
L. IMF program (binary)	−0.0220 [0.0593]	0.3493 [0.5452]
L. Labor conditions	−0.1955** [0.0982]	0.6509** [0.2938]
L. Other conditions^{O}	0.0032 [0.0136]	0.0161 [0.0401]
L. Education	1.1320*** [0.4363]	−1.3218 [3.8932]
L. Female population	0.1404 [0.0962]	0.7701 [0.7800]
L. Ethnic fractionalization	0.5039* [0.2957]	12.5415*** [2.7502]
L. Government orientation	−0.0100 [0.0263]	0.0888 [0.2159]
L. Democracy	0.0088 [0.0207]	−0.3047* [0.1738]
N	2238	2183
Country fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
F-statistic IMF program	136.17	147.44
F-statistic labor conditions	46.86	68.68
F-statistic other conditions	35.76	40.63

Notes: F-tests are Kleibergen-Paap Wald statistics for compound instruments. Cluster robust standard errors in brackets. ^{O}This variable corresponds to the total number of conditions minus the number of labor market reforms. *p < 0.10, **p < 0.05, ***p < 0.01.

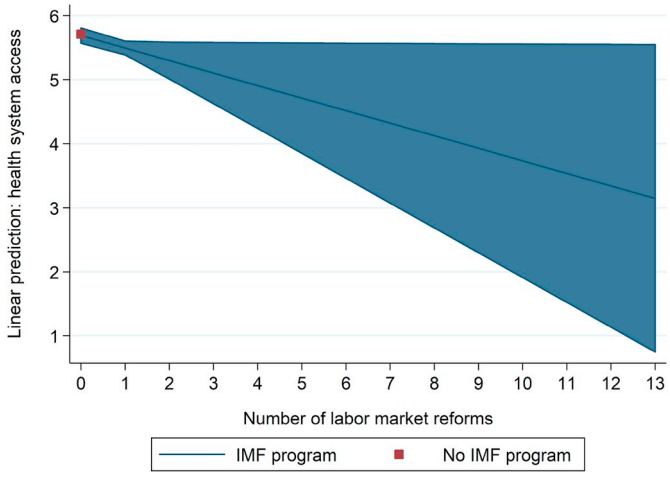
According to Model 4, each labor market reform increases neonatal mortality rates by 0.6509, holding all other variables constant. At the maximum, the marginal effect of labor conditions results in 8.46 additional deaths per 1000 live births. The latter is equivalent to Brazil relapsing from its 2000 level to 1990, when its neonatal mortality rate was 24.3, close to the sample's average.

5. Additional analyses

To test for robustness of results, we examined our models in additional ways—as discussed in detail in Web Appendix H. We first account for the implementation of policy reforms (Appendix H1), as IMF programs are often not fully implemented. The coefficient on all IMF-mandated reforms is slightly smaller for predicting health system access and neonatal mortality, with the latter no longer statistically significant at conventional threshold due to inflated standard errors. For labor conditionality, accounting for implementation exacerbates the detrimental impact on both health system access and neonatal mortality rates, and therefore remains consistent with our argument. Second, we



Graph 1. Labor market reforms in IMF programs, 1980–2014.



Graph 2. Marginal effect of labor market reforms on health system access.

recode the binary IMF program indicator as equal to one if a program was active at any time or over 12 months in a calendar year, respectively (Appendix H2). The results remain substantively the same. Third, we augment our models with additional explanatory variables (Appendix H3). The inclusion of income inequality, trade, and financial openness does not affect any of our analyses. In contrast, some specifications are sensitive to controlling for GDP per capita—likely due to post-treatment bias. Further, we observe that public health expenditure affects some of our IMF measures; further analyses suggest this is because of the smaller sample size. HIV prevalence is not observed before 1990, thereby decreasing the number of observations in our models by more than one third and yielding less precise estimates. Nonetheless, our results remain substantively the same, except the specification explaining health system access by the total number of conditions. Fourth, we perform the analyses on three additional outcome variables that extend our conceptualization of health equity: infant, child, and maternal mortality (Appendix H4). We find that the total number of conditions lowers child mortality only, whereas labor market reforms significantly increase all additional mortality rates.

6. Discussion and conclusion

This study has shown that structural adjustment policies account for differences in health equity between developing countries. IMF-mandated reforms, especially conditions mandating labor market deregulation, are associated with adverse consequences on health system access and neonatal mortality. In so doing, this article contributes to the growing literature on the unintended consequences of lending programs by international financial institutions on health outcomes (e.g., Coburn et al., 2015a, 2015b; Daoud et al., 2017; Daoud and Reinsberg, 2019; Kentikelenis, 2017; Kentikelenis et al., 2015; Noy, 2015, 2017, 2018; Pandolfelli et al., 2013; Shandra et al., 2011; Sommer et al., 2015; Stubbs et al., 2017a, 2017b; Thomson et al., 2017).

We note three limitations. First, there is substantial variation in health inequities around the globe (Beckfield et al., 2013). Our aggregate population statistics capture these only imperfectly. Yet, in view of the scarce data available for cross-national panel studies, this research offers an alternative way to examine health equity. Second, by investigating changes in national-level data on health system access and neonatal mortality, our analyses fail to examine within-country variation of these measures—another source of health inequities. Third, structural adjustment entails a broad set of policy reforms implying multiple pathways that link to the social determinants of health and health equity. Due to the limited scope of this article, we focus on direct pathways and explicate detailed mechanisms only for labor market reforms. Future research should carefully consider the role of moderating variables such as state capacity—which are themselves affected by IMF programs (Reinsberg et al., 2018, 2019a).

Our analyses offer two key lessons. First, our findings elaborate on how international-level determinants of socio-economic and political context create health inequities. These can be coercive processes like conditionality—as discussed in this article—or soft-and-subtle processes like technical assistance and policy learning from international actors (e.g., Broome and Seabrooke, 2015). Researchers and policymakers need to scrutinize pathways that link such aspects of globalization to health equity. In doing so, and building on scholarship on globalization and health (Labonté and Schrecker, 2007; Labonté et al., 2009), we advocate for a broad research agenda that disaggregates these determinants—as this study has done in unpacking the policy component of structural adjustment.

Second, international financial institutions must ensure that equity considerations are an essential part of all new lending arrangements. Our results suggest that the IMF has failed to do so. Similarly, the World Bank continues to prioritize efficiency over equity (even though its health sector reforms in Latin America were associated with less adverse health consequences; see Noy, 2015, 2017, 2018). Nonetheless, the latest edition of the Bank's flagship *World Development Report* promotes labor market deregulation (World Bank 2019)—with potentially adverse effects on health equity, as our study shows.

Our findings relate to broader debates about international financial institutions and development. The IMF and the World Bank favor 'targeting' as a strategy to address social challenges, rather than promote universal coverage (Noy, 2018; Stubbs and Kentikelenis, 2018b). Targeted programs undermine solidarity and increase stigma, which ultimately might work against the interests of the very groups targeted in these interventions (Noy, 2018). Further, while the IMF claims to bolster human rights through its activities, a recent report demonstrates that the Fund's perspective on development challenges countries' ability to achieve women's rights and gender equality (Bretton Woods Project, 2017). Likewise, questions remain as to the IMF's consideration of distributional consequences in its policy advice (Forster et al., 2019; Mariotti et al., 2017; Nunn and White, 2016). If the Sustainable Development Goals are to be reached, international financial institutions need to translate their official narrative into practice.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2019.112496.

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