

Women's Political Representation and Child Health in Developing Countries

Does Critical Mass Matter? Women's Political Representation and Child Health in Developing Countries*

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Studies on developed countries demonstrate that an increase in women legislators leads to a prioritization in health, an increase in social policy spending, and a decrease in poverty. Women representatives could therefore improve development trajectories in developing countries; yet, currently, no cross-national and longitudinal studies explore this possibility. Using random effects panel regression, we examine the influence of women's representation on child health (one development indicator) across 102 developing countries from 1980 to 2005. Compared to countries with no women in parliament, countries meeting a 20-percent threshold experience increased rates of measles immunizations (10 percentage points), DPT immunizations (12 percentage points), infant survival (0.7 percentage points) and child survival (1 percentage point). Incremental increases in women's representation show that child health improves most in socially and economically disadvantaged countries, and in countries less integrated in the world polity. Our findings reveal the importance of increased women's representation, particularly in less developed and less globally embedded countries.

Over the last three decades, women have been streaming into legislatures across developing countries, particularly those undergoing transitions to democracy. In 2012, women's legislative representation has increased to 37.4 percent in Argentina, 42.3 percent in South Africa, 39.2 percent in Mozambique and 36 percent in Tanzania. If the United Nations' (UN) claim that a "critical mass" of at least 30 percent women within legislative bodies should influence policy passage is true ([United Nations Equal Opportunities Commission 2003](#)), then this increase in women legislators could have profound effects on development outcomes.¹

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Previous studies both bolster and question the role of critical mass on policy (Childs and Krook 2009; Kittilson 2008; Lovenduski and Norris 2003; Paxton and Hughes 2007; Poggione 2004). Yet few cross-national and longitudinal studies, if any, examine the direct effects of women's national legislative representation on development indicators. Given that studies on *developed countries* demonstrate that an increase in women legislators leads to a prioritization in health (Kittilson 2008; Lovenduski and Norris 2003; Paxton and Hughes 2007), an increase in social policy spending and a decrease in poverty (Bolzendahl 2009; Bolzendahl and Brooks 2007; Brady 2009), women's representation in *developing countries* could vastly improve a country's development trajectory. *Using pooled time series analysis among 102 developing countries from 1980 to 2005, we test the UN claim of critical mass by examining whether an increase in women legislators leads to improvements in child health—one critical measure of development.*

Although economic indicators help to explain economic development, they do not account for widespread access to resources in the way child health indicators do (Sen 1999). For example, although *immunizations* have become more readily available through international aid, they are still not accessible to all, and poorer populations, usually those within rural areas, often do not have the time, money or knowledge needed to travel to locations where immunizations are available (Coninx et al. 1998; Levine 2007; Sen 1999). Similarly, *infant and child mortality* rates reflect access to resources, such as doctors and education, which help to alleviate illnesses (Lipton and Ravallion 1995; Sen 1999; Victoria et al. 2003). Because the above-mentioned measures capture levels of development, scholars often rely on them to determine how to improve economic and health situations. In existing studies, gross domestic product (GDP) per capita, girls' secondary enrollment, HIV/AIDS rates and debt dependence are often highlighted as improving child health (Boyle et al. 2006; Bradshaw et al. 1993; Roemer and Roemer 1990; Scanlan 2010; Subbarao and Raney 1995; Wimberly 1990). An increase in women's legislative representation, however, has yet to be tested.

Previous research on women's legislative representation focuses on what causal factors contribute to increases in representation (Fallon, Swiss and Viterna 2012; Inglehart and Norris 2003; Kenworthy and Malami 1999; Paxton 1997; Paxton and Kunovich 2003), and demonstrates that these increases lead to greater spending on social policies in welfare states (Bolzendahl 2009; Bolzendahl and Brooks 2007; Brady 2009), in addition to a greater passage of women friendly policies more broadly (Childs and Krook 2009; Kittilson 2008; Schwindt-Bayer 2006). Yet most studies focus only on developed countries (Bolzendahl and Brooks 2007; Brady 2009; Kittilson 2008; Meyer 2003), or developed and developing countries combined (Schwindt-Bayer and Mishler 2005). The limited research on developing countries tends to be case studies (Chattopadhyay and Duflo 2004; Franceschet and Piscopo 2008; Goetz 2002; Schwindt-Bayer 2006). We build on this literature by focusing on the effect of women's representation on development across countries and over time. Specifically, we examine the effect of women's parliamentary participation on child health, with particular attention given to immunization rates and infant/

child survival rates.² Additionally, as most studies do not focus on developing countries, the effects of social and economic development, democracy and the role of global integration on health via women's legislative representation are often overlooked. We, therefore, explore whether women legislators' effects on child health are moderated by a nation's economic development (GDP per capita) and social development (girls' secondary educational enrollment). Previous studies show that these indicators improve population health (Boyle et al. 2006; Roemer and Roemer 1990; Subbarao and Raney 1995). We further examine whether democracy and world polity influences contribute to women's legislative effect on child health, as research is split on whether they positively influence immunization and infant/child survival rates (Navia and Zweifel 2003; Levine 2007; Palmer et al. 2009; Ross 2006; Sadasivam 1999).

Women's Legislative Representation and Child Health

Critical Mass and Development

Kanter (1977) introduced the notion of critical mass when examining women's participation in U.S. corporate settings. According to Kanter, when women comprised less than 15 percent of the organization, they were often considered tokens and likely to avoid addressing gendered issues. However, once women reached 15 percent or more, possibilities to form alliances and address gendered concerns improved. Dahlerup (1988) expanded upon this notion by applying it to women's legislative behavior in Sweden. She demonstrated that women tokens were less likely to assimilate within the legislative context, but as numbers increased, resistance to women's presence decreased. Like Kanter, though, she argued women could participate in "critical acts" to change institutions and policies if they formed alliances and mobilized appropriate resources (Childs and Krook 2009; Dahlerup 1988; Kanter 1977). From these initial studies, a burgeoning literature emerged analyzing whether the number of women in legislatures (descriptive representation) would affect the types of policies they address (substantive representation).

Although most studies on women's substantive representation focus on women and children's rights in developed countries (for exceptions, see below), the findings provide theoretical guidelines for understanding developing contexts.³ For example, many scholars argue that male and female legislators vote differently according to their gendered interests (Swers 1998; Thomas 1991), even when controlling for political party and institutional factors (Kittilson 2008; Lovenduski and Norris 2003; Meyer 2003). They further indicate that an increase in women's legislative representation leads to greater initiation of women and children's rights bills (Kittilson 2008; Meyer 2003; Schwindt-Bayer 2006), and the passage of more women friendly policies (Celis 2007; Childs 2002). Indeed, in terms of state development, scholars demonstrate a link between an increase in women's representation and an increase in social policy spending, as well as a decrease in poverty (Bolzendahl 2009; Bolzendahl and Brooks 2007; Brady 2009).

Yet other scholars argue that an increase in women's representation alone does not affect legislative behavior. Rather, they contend that party dominance, affiliation, cleavages and loyalties (Caiazza 2004; Childs and Krook 2009; Grey 2002; Poggione 2004) along with institutional structures (Childs and Krook 2009) influence women's behaviors. Some further suggest that rather than critical mass, critical actors are key (Chaney 2006; Childs and Crook 2009), while others indicate that women's influence on policy implementation and outcomes is unclear (Grey 2002; Schwindt-Bayer and Mishler 2005; Schwindt-Bayer 2006). Literature in developed countries, thus, demonstrates a link between descriptive and substantive representation *within* the legislature, dependent on political parties, institutional structures, loyalties and critical actors. It also reveals that an increase in women's representatives improves social policy spending and decreases poverty. However, the link between descriptive and substantive representation in terms of policy implementation remains debatable.

Only a few studies analyze women's substantive representation in developing countries. Scholars examining nondemocratic states suggest that one party states, such as Rwanda and Uganda, and pseudo-democratic states, such as Morocco, constrain women's legislative behavior (Burnet 2008; Goetz 2002; Sater 2007). Women's influence in democratic countries, however, is not as clear. On the one hand, in India, Chattopadhyay and Duflo (2004) find that village councils that reserve one third of the seats for women invest more in infrastructural projects that affect women, such as access to drinking water. On the other hand, Schwindt-Bayer (2006) finds that although women have different substantive preferences for bill initiation than men, women's marginalization within legislative bodies prevents them from having their preferences translate into legislative action in Colombia, Argentina and Costa Rica. Franceschet and Piscopo (2008) similarly find that although women introduce more women friendly legislation in Argentina, institutional structures block them from instituting the legislation. These studies present a complex reality. Nondemocratic settings *appear* to confine women's abilities to transform legislation, while democratic settings *may* improve women's chances of influencing legislation.

The above literature provides insight into the role of women's critical mass within legislatures. However, the vast majority are case studies, and the limited cross-national studies focus on developed countries. The one exception examines 31 democracies in developed and developing countries at one time point (Schwindt-Bayer and Mishler 2005).⁴ Moreover, current studies in developing countries do not move beyond policy to examine whether an increase in women's representation may affect a country's development trajectory. Existing literature demonstrates that economic (GDP per capita) and social (girls' secondary enrollment) development consistently improves child health (Shen and Williamson 1997; Subbarao and Raney 1995; Wimberly 1990), but it does not examine how these development indicators may interact with an increase in women's legislative representation. We therefore account for a country's economic and social development in testing the effects of women's legislative representation on child health outcomes.

Democracy

Although no studies examine whether an increase in women's legislative representation combined with democracy leads to positive development outcomes, numerous studies do explore the influence of democracy on health. The findings are mixed. Some scholars find that democracy leads to an increase in life expectancy and immunizations, and a decrease in infant/child mortality and maternal mortality (Alvarez-Dardet and Franco-Giraldo 2006; Baum and Lake 2001; Navia and Zweifel 2003; Przeworski et al. 2000; Safaei 2006; Shandra et al. 2004). Others find that democracy has no effect or a negative effect on life expectancy, infant/child mortality and maternal mortality rates (Ross 2006; Wejnert 2008).

The majority of existing studies argue that democracy leads to positive health outcomes, yet most of these cross-sectional studies do not examine patterns for more than two time points. For example, Shandra, Shandra and London (2010) regress infant mortality in 2005 on independent variables from 1990 to demonstrate that nongovernmental organizations positively influence infant mortality when accounting for democratic status. Using the same method, Shandra et al. (2004) further show that penetration by multinational corporations (MNCs) increases child mortality in countries with lower levels of democracy. Additional studies using only one time point, demonstrate that democracy improves gender equality, which, in turn affects reproductive health—inclusive of infant and maternal mortality rates (Pillai and Gupta 2006; Wang 2004). Other cross-sectional studies indicate that democracy positively affects life expectancy, infant/child mortality and adult mortality (Alvarez-Dardet and Giraldo 2006; Safaei 2006).

Studies examining the effect of democracy on health indicators *over time* use samples that include both developed and developing countries, and the findings are divided. Navia and Zweifel (2003) find that immunizations are successful in democracies but not dictatorships and that foreign aid decreases child mortality in democracies but increases them in dictatorships. Besley and Kudamatsu (2006), along with Baum and Lake (2001), find that democracy leads to increased life expectancy. Baum and Lake (2001) also demonstrate that democracy is positively linked to spending on public services, which, in turn affects immunizations and infant mortality. Ross (2006), however, points out that most studies do not consider fixed effects and exclude nondemocratic countries that have good economic and social records, such as Cuba and Saudi Arabia. When the sample is broadened, he reveals that democracy does not lead to a decrease in child mortality and, thus, challenges previous studies linking democracy to positive health outcomes. He further calls on scholars to explore political factors beyond democracy that contribute to the health. Wejnert (2008) adds to this by arguing that when testing for democracy, developed and developing countries should be separated. Because both sets of countries have different histories and different development trajectories, different explanatory factors may contribute to outcomes (Matland 1998; Viterna, Fallon and Beckfield 2008).⁵ Wejnert (2008) tests the effects of democracy on women's reproductive health and finds that while reproductive health improves for women within developed countries, this is not the case within developing countries.

Using multiple time points and limiting our data to developing countries we test whether the effects of women's legislative representation on health is influenced by democratic status. We further take up [Ross' \(2006\)](#) call to explore what political factors beyond democracy contribute to health outcomes via women's legislative representation.

International Ties

Current research on the effects of international ties on health do not explore the role women's legislative representatives may play, despite the fact that integration into the larger world polity may influence legislative behavior. Instead, cross-national longitudinal studies examining health generally place emphasis on basic international measures, such as foreign aid and debt dependence ([Frey and Field 2000](#); [Shen and Williamson 2000](#); [Wimberley 1990](#)). Studies moving beyond this frame frequently turn to case studies to explore whether international protocols or specific country health programs, often supported or implemented by international nongovernmental organizations (INGOs), positively affect health outcomes ([Levine 2007](#); [Sadasivam 1999](#)). For example, a number of studies examine the effectiveness of the United Nations' International Conference on Population and Development (ICPD) Programme of Action developed in 1994 to address reproductive health issues. Results indicate both positive and negative outcomes ([Hardee et al. 1999](#); [Sadasivam 1999](#)), yet successful countries that committed to the Programme of Action were often those that initiated specific health programs within their countries ([Hardee et al. 1999](#)). In addition, studies focusing on specific in-country programs, with few exceptions ([Pfeiffer 2003](#); [Solomon et al. 2008](#)), demonstrate decreased infant, child and maternal mortality and increased immunization access ([Goodburn et al. 2001](#); [Valdez et al. 2005](#)). Though these case studies suggest that international protocols combined with INGO support lead to improvements in health, results are based on specific examples that include in-country factors. They do not consider the role of politics and, particularly, how women's legislative representation may interact with INGO support to contribute to results.

Although cross-national comparative literature on INGO influence does not focus on women's legislative representation, it does suggest that the presence of INGOs improves development, if not health. [Roberts \(2005\)](#), using lagged independent variables from 1980 among a sample of 65 developing countries, demonstrates that an increase in INGO sector ties leads to an increase in human development indicators in 2000. Similarly, [Bradshaw and Schafer \(2000\)](#) use a panel model with a lagged dependent variable to show that INGO expansion has a positive effect on economic growth and access to clean water. [Schafer \(1999\)](#) further reveals that increased INGO memberships lead to increased secondary enrollment rates. [Shandra, London and Williamson \(2003\)](#) confirm [Bradshaw and Schafer's](#) findings that INGOs improve development by demonstrating that increased INGO ties leads to decreased overurbanization in developing country contexts. These studies, all using lagged panel approaches, indicate that integration into the world polity via INGOs improves development and, thus, most likely, would have a positive effect on health outcomes.

One cross-national study, nonetheless, indicates that international ties through human rights treaties have no effect on population health. Palmer et al. (2009) examine whether human rights treaties impact infant, child and maternal health across 170 developed and developing countries and find human rights treaties have no effect on health. Building on this literature, we test whether increased women's representation combined with INGOs and human rights treaties improves child health.

Data and Methods

Random Effects Panel Regression

Our sample consists of 102 developing countries. To select and restrict the sample, we follow Brady et al. (2007) and include any country with a population of at least half a million people and define developing countries as those with less than \$5,000 USD GDP per capita in current 1980 dollars (\$12,000 USD in constant 2000 dollars).^{6, 7}

The dataset consists of an unbalanced panel with observations every 5 years between 1980 and 2005. This time period encompasses the democratic "third wave" in developing countries (Huntington 1991), allowing us to examine women's increased legislative representation over time, as well as whether democratic status impacts their effects on child health. Owing to missing data, not every country is included in each year. New countries enter the dataset in the first panel year following their independence or creation.

We use random effects panel regression models.⁸ The models include country measures that vary over time, and random effects specification also allows us to estimate coefficients for variables that do not vary over time, such as region. Our four health measures demonstrate AR(1) autoregressive disturbance over time, so we use a modified error term rather than including a lagged dependent variable.⁹ Autocorrelation coefficients (ρ) are reported for each model.¹⁰

Health Development Measures

Four measures of child health are included as dependent variables in our analysis. These variables are from the World Bank's World Development Indicators (WDI) 2010 database (World Bank 2010):

- The measles immunization rate is the percentage of children between 12 and 23 months of age that received at least one dose of measles vaccine, the requirement needed to be immunized.
- The DPT immunization rate is the percentage of children between 12 and 23 months of age that received three doses of the vaccine against diphtheria, pertussis and tetanus. A minimum of three doses of DPT are required for immunization.
- Infant survival: Rather than using *mortality* rate per 1,000 live births, we present our data as infant *survival* rates—the percentage of infants born to survive their first year of life. This permits easier comparison between infant survival and other health measures.

- Under-five survival: As with infant survival, we use under-five survival rates, calculated as the percentage of children in a country estimated to survive past their fifth birthday.

Decomposing the variance of our dependent variables reveals that all four vary between (cross-sectionally) *and* within (longitudinally) countries. Immunization rates demonstrate greater variance within countries over time. The within country share of variance for measles immunization is 76.5 percent, while for DPT it is 65 percent. In contrast, the child survival rates have a greater share of variance due to between country factors. Infant survival's between country variance is 83.7 percent, while for under-five survival it is 86.5 percent.

Women's Political Representation

Our measure of women's political representation is a 5-year lag of the percentage of seats held by women in the lower/single house of the national legislature at the end of each of our panel years (*Inter-Parliamentary Union 2011*). We chose a 5-year lag since the mean electoral term across our sample is 4.93 years. The mean level of women's representation for all 102 countries included in our largest model sample over the six panels is 7.1 percent. This varies from an average of 3.1 percent in the 1980 panel to 9.95 percent in 2005. We run models using both a categorical measure of women's representation (Table 1) and a continuous measure (Tables 2 and 3).¹¹ We use the categorical measure to test threshold levels of women's representation. We code countries into the following categories of representation: 0 percent, >0-9.99 percent, 10-19.99 percent, and 20 percent or greater.¹² Zero percent women's representation in parliament is used as the reference category.

Political Factors and Democracy¹³

Combined Democracy Index Measures

We combined both Polity IV and Freedom House by reversing the Freedom House aggregate average of civil and political rights for each country and recoding the Polity IV index into an index bounded from 0-20. We then standardized both variables into z-scores and added the two together, yielding a total combined democracy index ranging from -2.9 to 3.1, with more democratic states receiving higher scores. The mean score for the 102 countries included in our largest sample is -0.05. The mean score ranges from a low of -0.77 in 1980 to a high of 0.73 in 2005. By combining these measures we hope to bridge the sometimes discrepant results found in previous cross-national statistical tests of democracy that privilege one of these measures over the other.¹⁴

Count of Elections Since 1945

We include a measure of whether elections are relatively new, or whether a country holds a longer tradition of electing political representatives. The count of elections variable includes all lower/single house elections listed in the International Institute for Democracy and Electoral Assistance's (IDEA) Voter Turnout database, and includes all democratic and nondemocratic elections

where there is at least one opposition party on the ballot. Elections in one-party states are excluded.

Left Party in Power

We include a dummy variable that denotes whether a left party is the dominant or governing party in parliament. This data are from the World Bank's Database of Political Institutions (Beck et al. 2001).

Other Factors

Socioeconomic Factors

To account for varying levels of development, we include population density, GDP per capita (constant 2000 \$USD), birth rate, total debt service as percent of gross national income, and female gross enrollment ratio in secondary education.¹⁵ In addition, to account for differences between regions, we include a regional dummy variable with the following five categories: Sub-Saharan Africa, Middle East and North Africa, Asia-Pacific, Latin America, and the reference category of Central and Eastern Europe.^{16, 17}

International Factors

To capture relative integration into the world polity, we include the following three variables.

- **Foreign aid:** This is measured as total foreign aid per capita (constant 2000 \$USD). Countries in receipt of higher levels of aid should show improved development indicators in contrast to those who receive little or no aid. We use the natural log of this measure to account for skewness.¹⁸
- **INGO memberships:** We incorporate a count of national memberships in INGOs based on the Union of International Association data from 1980 to 2005. We use the natural log of this count to adjust for a skewed distribution.
- **Human Rights Treaty Ratification:** We include a yearly count of the six main UN human rights treaties a country has ratified.¹⁹ Several of the major UN human rights treaties discuss the protection of rights to health in society. For instance, Article 12 of the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) requires states to eliminate discrimination against women's access to health care, while the Convention on the Rights of the Child's (CRC) Article 24 explicitly specifies state parties' responsibility to protect the right of children to access to health services.

Results

Table 1 shows the effect of the categorical measure of a 5-year lag of women's representation on our four child health measures.²⁰ Models 1 and 2 show that higher levels of women's representation are associated with greater measles immu-

Table 1: Effects of a Categorical Measure of Women's Political Representation on Dependent Variables, 1980-2005

Variable	Measles		DPT Immunization		Infant Survival		Under-Five Survival	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Region (Central Eastern Europe)								
Sub-Saharan Africa	-33.63***	12.47	-34.18***	17.91*	-8.25***	-1.64	-14.15***	-3.66*
Middle East & North Africa	-18.45*	3.50	-13.37	11.11	-3.26**	-.65	-4.21*	-.32
Asia-Pacific	-28.04***	3.92	-25.92***	9.60	-4.33***	-.41	-6.18***	-.08
Latin America	-22.20**	-2.28	-25.47***	-1.82	-2.34*	-.84	-3.30	-.91
Women's Representation Categorical Variable (0%)								
>0-9.99%	11.49**	4.58	13.10***	6.40*	.84***	.06	1.31***	.11
10-19.99%	15.11***	3.98	18.25***	6.53	1.19***	-.11	1.85***	-.15
20% +	17.96**	10.44*	19.05***	11.92*	1.64***	.66*	2.69***	1.14*
Development Factors								
Population density, people per sq. km		-.00		.00		.00		.00
Logged GDP per capita		-.22		-.70		.54**		.89***
Logged birth rate		-27.02***		-27.88***		-2.37***		-3.37***
Total debt service		.07		.06		-.01		-.01
Logged female secondary gross enrollment ratio		7.55***		10.54***		1.31***		2.40***
Political Factors								
Combined Democracy Index		-1.68*		-1.01		.09		.12
Count of parliamentary elections, post-1945.		1.22**		1.03*		.11*		.14
Left party in power		1.18		-.32		-.14		-.31

International Factors					
Logged Aid per capita	2.95**	3.40***	.07	.15	
Logged national memberships in INGOs	1.83	2.58	.64***	.98***	
Human rights treaties ratifications	3.32***	2.83***	-.01	-.01	
Constant	81.82***	84.97**	79.96***	71.75*	97.28***
Observations	421	421	431	431	460
Number of countries	101	101	101	102	102
Autocorrelation coefficient	.53	.32	.57	.36	.73
R ² overall	.16	.46	.15	.50	.48
R ² between	.33	.49	.30	.52	.55
R ² within	.08	.49	.11	.52	.13

* p < .05 **p < .01 ***p < .001

Note: Reference category in parentheses.

nization rates, with the highest threshold category for women's representation showing the greatest difference from the reference category (nearly 18 percentage points higher in Model 1). In Model 2, this significant difference remains when development and political factors are controlled for supporting our hypothesis that a critical mass of women in parliament contributes to greater immunization rates.

Additionally, in Model 2, birth rate has a negative effect, while female secondary enrollment, aid per capita and human rights treaty ratification are positively related to measles immunization. Democratic factors show a contradictory pattern. Countries with higher scores on our combined democracy rate appear to have lower immunization rates,²¹ while countries with more experience of conducting elections have higher immunization rates.

Models 3 and 4 examine the relationship between our categorical measure of representation and DPT immunization rates. The results broadly echo those found with measles immunization. Model 4 shows that in contrast to a country with no women in parliament, a country with more than 20 percent women yields a nearly 12 percentage point increase in DPT immunization rate. In comparison, a country in the >0-9.99 percent category is expected to have only a 6.4 percentage point higher immunization rate.²²

Models 5 and 6 capture the effects of our categorical representation measure on infant

survival rates. The highest threshold category of representation is significantly different than the reference category in both models. However, in contrast to immunization rates, the magnitude of the effect is much smaller. In Model 6, for instance, a country in the highest category of representation would see only a 0.66 percentage point difference in infant survival compared with a country with no women in parliament, all else equal.

The socioeconomic factors again point to increased levels of development contributing to infant survival, and GDP per capita is associated with increased infant survival. Politically, only the elections count measure is significant and is positively related to infant survival. International influences show that INGO memberships count is associated with higher rates of survival, but that aid and human rights treaty ratification are not significant.

Finally, Models 7 and 8 show the results from testing the effect of the categorical representation measure on under-five survival rates. The results parallel infant survival except that the magnitude of the effect is slightly higher. For instance, in Model 8, a country with greater than 20 percent women's representation is expected to have a 1.14 percentage point difference in under-five survival rates from a country with no women in parliament.

Overall, Table 1 shows support for our hypothesis that countries with a critical mass of women's legislators above 20 percent will experience increases in child health. The UN's critical mass claims appear to be validated by empirical evidence.

We also modelled the relationship between women's representation and child health using a continuous measure of women's representation. In Tables 2 and 3, we interact this continuous measure of women's representation with three control variables (GDP, female secondary education and INGO memberships) to examine how the effect of women's representation might be moderated by other factors already shown to be positively linked to child health in our earlier models.²³

Table 2 tests the effects of a 5-year lag of women's representation on measles and DPT immunization rates. In all four models, we see that women's representation is statistically significant. In Model 1, for instance, an increase of one percentage point in women's representation leads to a 0.66 percentage point increase in measles immunization rates. Model 1 also reveals that a country with the mean level of women's representation (7.1% for the whole sample) would have a nearly 4.6 percentage points higher rate of measles immunization than a country with no women in parliament.

Model 2 incorporates the development, political and international factors. Similar to Table 1, female educational enrollment has a strong positive effect on measles immunization rates, while higher birth rates are associated with reduced rates of immunization. Both the combined democracy index and count of elections resemble the results from Table 1. As for international factors, both aid per capita and human rights treaty ratifications are positively correlated with measles immunization, with each additional treaty ratification associated with a 3.4 percentage point increase in children immunized.

Table 2: Effects of a Continuous Measure of Women's Political Representation on Immunization Rates, 1980-2005

Variable	Measles Immunization		DPT Immunization	
	(1)	(2)	(3)	(4)
Region (Central Eastern Europe)				
Sub-Saharan Africa	-33.50***	14.36	-33.75***	17.47*
Middle East and North Africa	-18.09*	4.79	-12.46	11.79
Asia-Pacific	-27.94***	6.20	-25.77***	9.71
Latin America	-22.61**	-.80	-25.52***	-1.78
Percentage of female legislators lower/single house	.66***	2.50*	.81***	.47**
Development Factors				
Population density, people per sq. km		-.00		.00
Logged GDP per capita		-.03		-1.01
Logged birth rate		-28.87***		-27.71***
Total debt service		.05		.05
Logged female secondary gross enrollment ratio		7.00**		10.44***
Political Factors				
Combined Democracy Index		-1.62*		-.95
Count of parliamentary elections, post-1945.		1.18*		.95
Left party in power		1.14		-.34
International Factors				
Aid per capita		3.29**		3.33**
Logged national memberships in INGOs		5.24*		3.07
Human rights treaty ratifications		3.35***		2.79***
Interaction Terms				
Women's representation x INGO memberships		-.37*		
Constant	88.52***	71.44*	86.95***	74.49**
Observations	421	421	431	431
Number of countries	101	101	101	101
Autocorrelation coefficient (rho)	.53	.31	.57	.36
R ² overall	.15	.47	.14	.50
R ² between	.32	.48	.29	.52
R ² within	.08	.50	.11	.52

* p < .05 **p < .01 *** p < .001

Model 2 also shows an interaction between women’s representation and the count of INGO memberships in a country. By interacting these variables, we see how women’s representation affects measles immunization rates in countries with differing degrees of connection to global civil society. The negative coefficient for the interaction term shows that as INGO memberships increase, the positive effects of women’s representation are moderated. Figure 1 captures this interaction by plotting the effects of INGO memberships at four different percentile levels (25th, 50th, 75th, 99th), while holding women’s representation at its mean (7.1%).

Figure 1 shows that an increase in INGO memberships diminishes the effect of women’s representation on measles immunization. At the lowest level of INGO memberships (25th percentile), we find the largest effect on measles immunization rates, with an increase of more than 3.4 percentage points. This combined effect decreases to 2 percentage points at median levels of INGO membership, and again to 0.7 points at the 75th percentile. This moderating effect of INGO membership in the final category is negative with a 2.2 percentage point decrease in immunization rate. The moderating effect of INGO memberships indicates that women’s representation has a greater effect on measles immunizations in countries with fewer ties to global civil society.

Models 3 and 4 in Table 2 reveal similar patterns for the effect of women’s representation on DPT immunization. Women’s representation has a statistically significant and positive relationship to DPT immunization rates. Using parameters from Model 3, a country at the mean level of women’s representation would be expected to have a DPT immunization rate 5.75 percentage points greater than a country with no women in parliament holding all else equal. In Model 4, the socioeconomic and international factors play similar roles with DPT immunization as they did with measles, but in the case of DPT none of the interaction terms were significant.

Table 3 presents the effects of women’s representation on both infant and under-five survival rates. The coefficient for women’s representation is significant in all six models. Similar to the categorical measure of women’s representation, the magnitude of the effect of women’s representation on infant survival

Figure 1. The Effects of Women’s Representation on Measles Immunization Rates at Varying Levels of INGO Membership

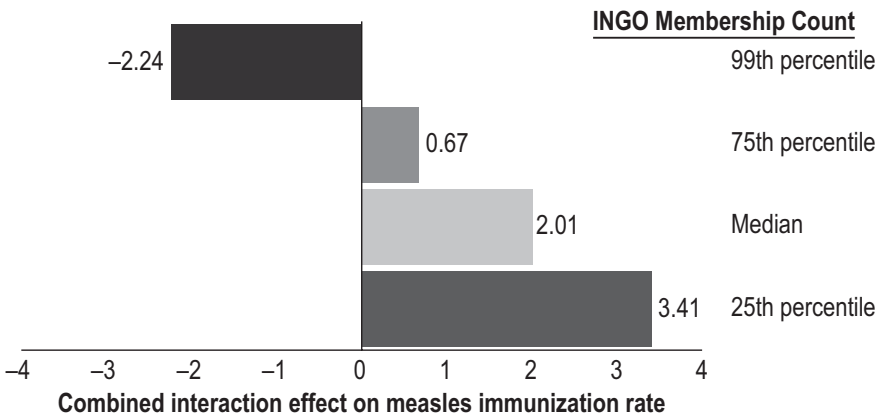


Table 3: Effects of a Continuous Measure of Women's Political Representation on Child Survival Rates, 1980-2005

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Region (Central Eastern Europe)						
Sub-Saharan Africa	-8.31***	-1.80*	-1.74*	-14.26***	-3.91**	-3.97**
Middle East and North Africa	-3.22**	-.84	-.75	-4.16*	-.64	-.60
Asia-Pacific	-4.35***	-.52	-.40	-6.22***	-.27	-.23
Latin America	-2.42*	-1.09	-1.00	-3.43	-1.34	-1.31
Percentage of female legislators lower/single house	.07***	.17**	.15*	.11***	.31**	.14*
Development Factors						
Population density, people per sq. km	.00	.00	.00	.00	.00	.00
Logged GDP per capita	.78***	.65**	.65**	1.33***	1.33***	1.05**
Logged birth rate	-2.38***	-2.38***	-2.33***	-3.42***	-3.42***	-3.24***
Total debt service	1.24***	1.23***	1.23***	2.26***	2.26***	2.52***
Logged female secondary gross enrollment ratio	-.01	-.01	-.01	-.01	-.01	-.01
Political Factors						
Combined Democracy Index	.09	.09	.10	.11	.11	.11
Count of parliamentary elections, post-1945.	.11*	.11*	.11*	.16*	.16*	.15
Left party in power	-.13	-.13	-.15	-.28	-.28	-.30
International Factors						
Aid per capita	.06	.06	.10	.13	.13	.11
Logged national memberships in INGOs	.60***	.60***	.78***	.91***	.91***	.86***
Human rights treaty ratifications	-.00	-.00	.01	.00	.00	.01

Continued

Table 3: Continued

Variable	Infant Survival Rate			Under-Five Survival Rate		
	(1)	(2)	(3)	(4)	(5)	(6)
Interaction Terms						
Women's representation x GDP per capita		-.02*			-.04**	
Women's representation x INGO Memberships			-.02*			
Women's representation x education						-.03*
Constant	97.68***	88.59***	88.21***	96.98***	80.02***	80.75***
Observations	460	460	460	460	460	460
Number of countries	102	102	102	102	102	102
Autocorrelation coefficient (rho)	.74	.59	.59	.75	.65	.65
R ² overall	.47	.79	.79	.52	.81	.81
R ² between	.55	.81	.81	.59	.83	.82
R ² within	.11	.62	.62	.11	.62	.61

* p < .05 ** p < .01 *** p < .001

is smaller than that seen with immunization rates. For instance, using the coefficient in Model 1, a country with the mean level of women's representation is predicted to experience a 0.5 point increase in infant survival when compared with an identical country with no women in parliament. Development factors follow similar patterns to those seen in Table 2. In addition, election counts and INGO memberships are both statistically significant and positively related to infant survival rates. The inclusion of interaction terms in Models 2 and 3 demonstrate how both GDP per capita and INGO memberships moderate the effects of women's representation on health.

Figures 2 and 3 plot the combined effects of women's representation interacted with GDP and INGO membership on infant survival for the same four levels used earlier in Figure 1. In both cases, the strongest positive effect of women's

Figure 2. The Effect of Women's Representation on Infant Survival Rate at Varying Levels GDP per Capita

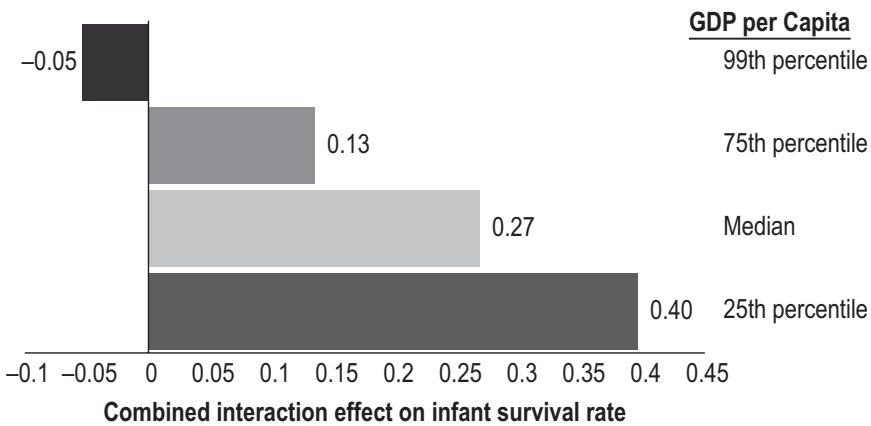
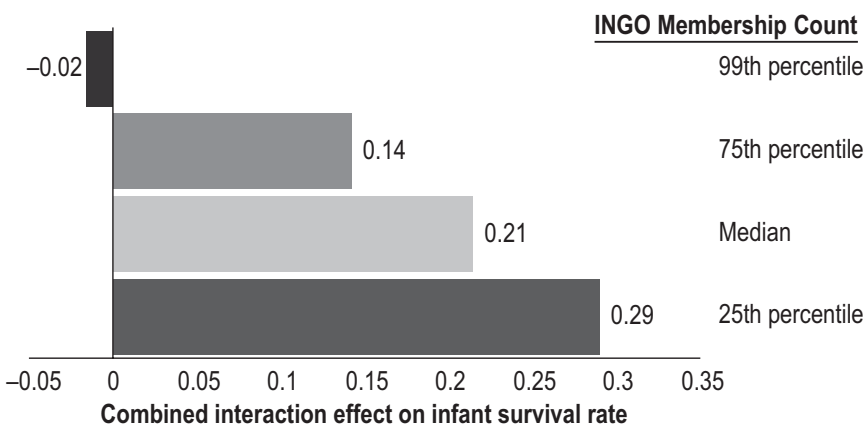


Figure 3. The Effect of Women's Representation on Infant Survival Rate at Varying Levels of INGO Membership



representation is found in countries with the lowest levels of GDP or INGOs. At the same time, countries with the highest levels of GDP and INGOs see the effect of women’s representation diminish to less than zero (-0.05 percentage points for GDP per capita and only -0.02 points for INGO membership).

Models 4 through 6 show the effect of women’s representation on under-five survival. In each model, the effect of women’s representation is statistically significant and positively correlated with child survival. We find that GDP per capita and education interact with the effects of women’s representation on health. Figures 4 and 5 plot the marginal effects of these interaction models and reveal similar moderating effects. Countries with the lowest levels of GDP per capita and female secondary enrollment benefit most from women’s presence in parliament. Likewise, countries with greater national incomes and education rates experience

Figure 4. The Effect of Women’s Representation on Under-Five Survival Rate at Varying Levels of GDP per Capita

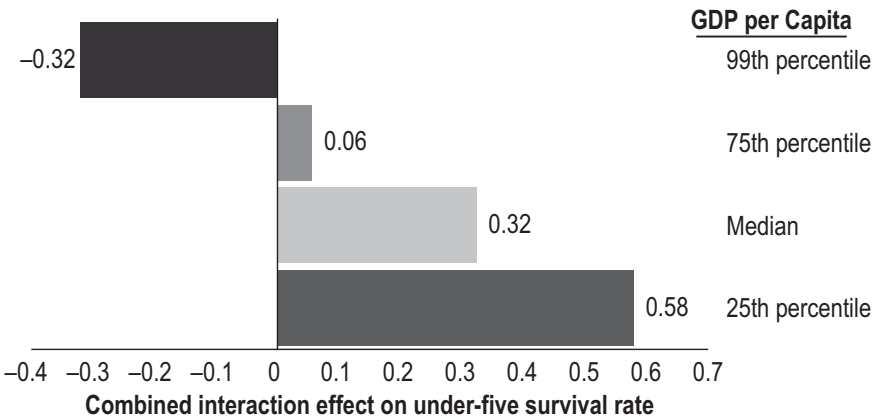
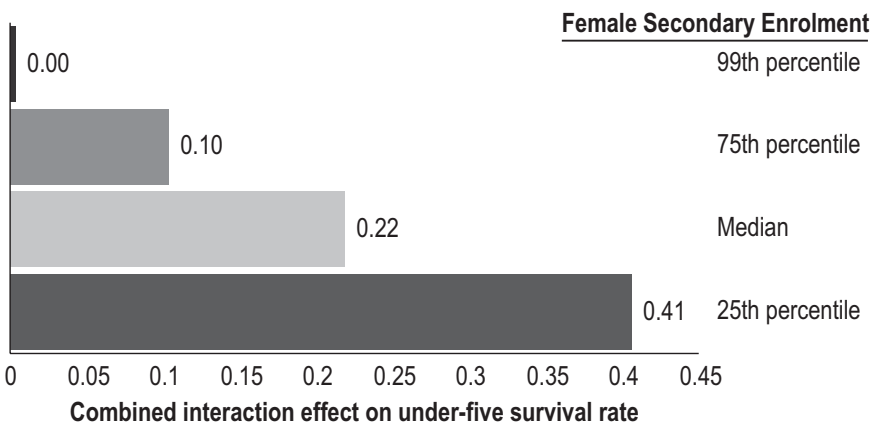


Figure 5. The Effect of Women’s Representation on Under-Five Survival Rate at Varying Levels of Female Secondary Enrollment



a decreased effect of women parliamentarians on child survival. These findings, along with findings from the previous tables, show support for the hypothesis that women's political representation contributes to positive health outcomes in developing societies.

Discussion

Previous global studies on women's legislative representation focus on causal factors contributing to representation, and existing literature examining the effects of increased representation on policy and social spending tends to be limited to developed countries or case studies. We add to this literature by exploring whether an increase in women's legislative representation improves child health outcomes, an indicator of development, across developing countries and over time. We find three broad patterns: 1) an increase in women's legislative representation contributes to improved child health, particularly in countries with low levels of economic and social development; 2) democratic status of a nation does not affect women's political influence on health; and 3) International ties, particularly in relation to INGOs, influence the effect of women's representation on measles immunization and infant mortality rates.

Critical Mass and Development

An increase in women's legislative representation improves child health. After 5 years, women's increased representation improves access to DPT and measles immunizations, whether categorical or continuous variables are used. For categorical measures, women's effectiveness is particularly apparent when the 20 percent threshold is met. Representation effects on immunization rates are further not dependent on economic and social development, unlike infant/child survival rates. Though women's representation improved survival rates once they reached a 20 percent threshold, their effects on survival were dependent on national income and girls' secondary enrollment when examining incremental increases in representation. When national income is lower, infant and child survival rates improve with increased representation, and when secondary enrollment is lower, child survival rates improve. Yet when income and enrollment increase, women's legislative effect decreases. These findings may suggest that immunizations are easier and faster to implement, since transforming survival rates requires change through health behavior, knowledge and infrastructure.

In sum, an increase in the percentage of women legislators has a significant and strong effect on child health, particularly in countries with lower social and economic development indicators. When national income and/or women's formal education is lacking, women's political power and presence becomes central to change.

Democracy

In contrast to women's political influence on health, we find no evidence to support the positive effect of democracy on child health. Although the effect of

democracy on measles immunization is negative in Model 2 of Tables 1 and 2, the significance of democracy disappears once Central and Eastern European countries are dropped from the equation. Moreover, democracy is not significant in any of the other models. Our general findings therefore support Ross (2006) and Wejnert (2008), who find that democracy does not influence health outcomes.²⁴ Despite these findings, we do not argue that democracy should be outright dismissed. Democracy among developing countries is still young and unstable, and as democracy becomes more stable and long lasting, results may change. Huber et al. (2006), for example, demonstrate that the longer a state has experienced democracy, the better it is in redistributing resources. Indeed, increased parliamentary elections appear to improve measles immunizations and infant survival rates. Currently, though, women legislators' effects on child health are not dependent on the democratic status of a nation. In the meantime, as Ross (2006) suggests, we must explore other political factors that contribute to improved health indicators. We do so by revealing the importance of increased women's representation generally, as well as in combination with national income and girls' secondary enrollment discussed above and in combination with international ties discussed below.

International Ties

Our findings both support and refute existing literature. Signing on to international human rights treaties does appear to contribute to increased rates of immunizations but not improved infant or child survival rates, whereas an increased presence of INGOs leads to better infant and child survival rates but not immunization rates in all instances. When examining the interaction of women's legislative representation with international ties, we find that international human rights treaties have no moderating effect on the influence of women's representation, while differing levels of INGOs do for measles immunization and infant survival rates. An increase in women legislators has the greatest effect in countries with a decreased INGO presence, and as the presence of INGOs increase, the influence of women legislators on measles immunization and infant survival rates decreases. INGO presence may suggest an increase in funding for specific projects targeting women and children's health. With an injection of funds, this effect overtakes the influence of women legislators. Yet when the presence of INGOs is small, women's increased legislative representation improves health indicators.

Conclusion

Broadly, our findings demonstrate that an increase in women's legislative representation contributes to improvements in child health across developing countries. In line with previous studies indicating the strong effect of national income and girls' secondary enrollment, we similarly find that income and girls' knowledge through education are some of the most important factors influencing health outcomes. Yet in countries where income and secondary enrollment are

low, women legislators then become particularly important players in improving infant and child survival rates. Women legislators have a similar influence on measles immunization and infant survival rates in countries that are not as well integrated into the larger world polity via INGOs. Our findings indicate that not only should the representation of women's legislators be advocated across the board in terms of increasing access to immunizations, but also specific attention should be given to countries with low levels of national income, girls' secondary enrolment and/or minimal presence of INGOs. These countries will benefit most from women's increased legislative representation.

Given that increased women's representation improves child health outcomes, recognizing the causal factors for greater legislative presence becomes particularly relevant. Previous global studies on women's legislative representation indicate that quotas, proportional representational systems, left-leaning parties in power, years since suffrage and Protestant-dominant countries tend to increase women's representation (Inglehart and Norris 2003; Kenworthy and Malami 1999; Paxton 1997; Paxton and Kunovich 2003). Across developing countries, studies additionally show that the democratization process, more so than proportional representational systems and Protestantism, contribute to increased representation (Fallon, Swiss and Viterna 2012; Viterna, Fallon and Beckfield 2008). These causal factors should help to inform future development policy on health through women's legislative representation.

This study demonstrates that women's access to and participation in national politics have profound implications for development trajectories. Nonetheless, more studies are needed to explore these concerns further. For example, although our findings are in line with literature demonstrating links between women's representation and a greater passage of women-friendly policies, they do not reveal the specific mechanisms that link increased women's legislative representation to improved child health. Future research should focus on women's legislative behavior across developing countries. Possible approaches include examining behavior in relation to social spending and the passage of legislation directly related to child health. Indeed, some scholars have begun this process through case studies (Burnet 2008; Chattopadhyay and Duflo 2004). Yet understanding broader trends of women's legislative behavior would provide greater insight into why increased women's legislators leads to improved child health. Beyond health, future studies could explore the effects women's legislators have on women's status and other development indicators, such as education, employment, maternity leave, domestic violence laws and sustained democratic states. Our study contributes to this process of understanding the role of women legislative representatives in developing countries, and we hope it inspires scholars to explore these issues further.

Notes

1. The United Nations claims a critical mass of women's representation emerges around 30 percent. However, because only two countries in our sample have lagged levels of

representation that meet or exceed 30 percent, we chose to make the highest threshold begin at 20 percent.

2. We present our data as survival rates as opposed to mortality rates (both capturing the same effect) to permit easier comparison between child survival and immunization rates.
3. These rights include, but are not limited to, maternity leave, child support, equal pay, affirmative action, reproductive rights, health policy innovation, violence against women and insurance coverage for mammographies.
4. This study finds that although women more readily address women's issues as numbers increase, policy outcomes remain uncertain.
5. Developed countries with long stable democracies combined with increased resources may capture positive health effects when placed in contrast to developing countries with limited resources and unstable political histories.
6. Small island nations and other microstates are excluded from the sample. These countries account for only a fraction of the world's population and have data availability problems (Bollen, Entwisle, and Alderson 1993).
7. We ran additional models selecting the sample of countries with GDP thresholds at lower levels. Results were broadly consistent with findings presented below.
8. We tested for the suitability of both fixed effects and random effects models (see Beckfield 2006), as well as the use of lagged dependent variables to control for serial autocorrelation (see Brady et al. 2007). Hausman tests revealed mixed support for the use of fixed effects models dependent upon the model specification. When we estimated fixed effects models, the direction of the relationship for the continuous measure of women's representation was consistent with the random effects specification for three of our four dependent variables, with measles being the exception. Because we were interested in accounting for interregional and international variation, we use random effects models, allowing us to include time-invariant features like region.
9. Achen (2000) identifies the negative effects associated with including a lagged dependent variable on the interpretation of other independent variables. To avoid this problem, we use Stata's *xtregar* to control for AR1 disturbance and manage unbalanced panels.
10. For each set of models, we examined data for outliers and influential observations by plotting leverage versus squared residuals for the sample observations and determined that outliers did not unduly affect our results.
11. We also modeled a possible curvilinear relationship between women's representation and our four dependent variables by including a squared women's representation term. Although this squared term was significant in a basic model that included region, it was not significant in the full model that included all other covariates. Therefore, we do not include a square term for women's representation.
12. See note 1.
13. Although the literature indicates that party affiliation, cleavages, institutional structures and critical actors may influence women's legislative behavior, we could not measure these variables due to data availability.
14. We also ran models with Polity IV and Freedom House separately with similar results.
15. These variables are from the World Bank's WDI dataset. We take the natural log of GDP per capita, birth rate and female gross enrollment to account for skewness.
16. We considered including controls for religion, but because of correlation between region and religion, we chose to exclude these controls.

17. We collected data on other health-related control measures: HIV/AIDS prevalence in the population aged 15-49 years; the estimated number of physicians per capita; and the percentage of population with access to improved water sources. Data availability over our panel periods was limited and including these measures drastically reduced our sample size. We interpolated and extrapolated missing data. The results were broadly consistent with what we present here. Yet because of lost observations and questions of data reliability, we chose not to present those models.
18. When transforming the aid per capita measure, we set four observations with negative values to zero, and then, to permit their inclusion in the analysis, added a constant of one to every aid per capita observation before calculating the natural logarithm.
19. We include the following treaties in this count: International Convention on the Elimination of All Forms of Racial Discrimination (ICERD); International Covenant on Civil and Political Rights (ICCPR); International Covenant on Economic, Social and Cultural Rights (ICESCR); Convention on the Elimination of all forms of Discrimination Against Women (CEDAW); Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT); and the Convention on the Rights of the Child (CRC).
20. Interpretation of a categorical interaction does not allow us to examine the moderating effect of GDP, education and INGOs. Please see Tables 2 and 3 for the continuous interactions.
21. When Central and Eastern European countries are dropped from the equation, the variable loses significance.
22. The different regional intercepts captured in Model 4 for DPT immunization make it appear as if Sub-Saharan Africa has significantly higher levels of DPT immunization than other regions. However, Sub-Saharan Africa in fact has the highest average birth rate of all regions. Taking into account these other factors explains why Sub-Saharan Africa has the lowest average rate of DPT immunization over time in our sample (60.8%), a far cry from levels in the Middle East (79.5%) or Central and Eastern Europe (95.4%).
23. We conducted all three interactions for each dependent variable. However, in the tables that follow, we present only the results that are statistically significant. We also interacted human rights treaties but found no significance.
24. We also interacted women's representation with democracy. Since there was no effect, we do not show the results here.

References

- Achen, Christopher H. 2000. *Why Lagged Dependent Variables can Suppress the Explanatory Power of Other Independent Variables*. Paper presented at the Annual Meeting of the Political Methodology Section of the American Political Science Association, UCLA.
- Alvarez-Dardet, Carlos, and Alvaro Franco-Giraldo. 2006. "Democratisation and Health After the Fall of the Wall." *Journal of Epidemiology and Community Health* 60(8):669-71.
- Baum, Matthew A., and David A. Lake. 2001. "The Invisible Hand of Democracy: Political Control and the Provision of Public Services." *Comparative Political Studies* 34(6):587-621.
- Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. "New Tools in Comparative Political Economy: The Database of Political Institutions." *The World Bank Economic Review* 15:165-76.
- Beckfield, Jason. 2006. "European Integration and Income Inequality." *American Sociological Review* 71:964-85.

- Besley, Timothy, and Masayuki Kudamatsu. 2006. "Health and Democracy." *The American Economic Review* 96(2):313-8.
- Bollen, Kenneth A., Barbara Entwisle, and Arthur S. Alderson. 1993. "Macrocomparative Research Methods." *Annual Review of Sociology* 19(1):321-51.
- Bolzendahl, Catherine. 2009. "Making the Implicit Explicit: Gender Influences on Social Spending in Twelve Industrialized Democracies, 1980-99." *Social Politics* 16(1): 40-81.
- Bolzendahl, Catherine, and Clem Brooks. 2007. "Women's Political Representation and Welfare State Spending in 12 Capitalist Democracies." *Social Forces* 85(4):1509-34.
- Boyle, Michael H., Yvonne Racine, Katholiki Georgiades, Dana Snelling, Sungjin Hong, Walter Omariba, Patricia Hurley, and Purnima Rao-Melacini. 2006. "The Influence of Economic Development Level, Household Wealth and Maternal Education on Child Health in the Developing World." *Social Science & Medicine* 63(8):2242-54.
- Bradshaw, York W., Rita Noonan, Laura Gash, and Claudia Buchmann Sershen. 1993. "Borrowing Against the Future: Children and Third World Indebtedness." *Social Forces* 71(3):629-56.
- Bradshaw, York W. and Mark J. Schafer. 2000. "Urbanization and Development: The Emergence of International Nongovernmental Organizations Amid Declining States." *Sociological Perspectives* 43(1):97-116.
- Brady, David. 2009. *Rich Democracies, Poor People: How Politics Explains Poverty*. New York, NY: Oxford University Press.
- Brady, David, Yunus Kaya, and Jason Beckfield. 2007. "Reassessing the Effect of Economic Growth on Well-Being in Less Developed Countries, 1980-2003." *Studies in Comparative International Development* 42(1-2):1-35.
- Burnet, Jennie E. 2008. "Gender Balance and the Meanings of Women in Governance in Post-Genocide Rwanda." *African Affairs* 107(428):361-86.
- Caiazza, Amy. 2004. "Does Women's Representation in Elected Office Lead to Women-Friendly Policy? Analysis of State-Level Data." *Women and Politics* 26(1):35-70.
- Celis, Karen. 2007. "Substantive Representation of Women: The Representation of Women's Interests and the Impact of Descriptive Representation in the Belgian Parliament (1900-1979)." *Journal of Women, Politics and Policy* 28(2):85-114.
- Chaney, Paul. 2006. "Critical Mass, Deliberation and the Substantive Representation of Women: Evidence from the UK's Devolution Programme." *Political Studies* 54(4):691-714.
- Chattopadhyay, Raghavendra, and Esther Duflo. 2004. "Women as Policymakers: Evidence from a Randomized Policy Experiment in India." *Econometrica* 72(5):1409-43.
- Childs, Sarah. 2002. *New Labour's Women MPs: Women Representing Women*. London, UK: Routledge.
- Childs, Sarah, and Mona Lena Krook. 2009. "Analysing Women's Substantive Representation: From Critical Mass to Critical Actors." *Government & Opposition* 44(2):125-45.
- Coninx, R., C. Dupuy, C. Hermann, G. Cruz Pires Ribeiro, M. Margot, and K. Lucic. 1998. "Vaccination of the Civilian Population in a Country at War: It Can Be Done; It Can Also Be Evaluated. The ICRC Experience in Mozambique." *Journal of Tropical Pediatrics* 44(3):186-8.
- Dahlerup, Drude. 1988. "From a Small to a Large Minority: Women in Scandinavian Politics." *Scandinavian Political Studies* 11(2):275-98.
- Fallon, Kathleen M., Liam Swiss, and Jocelyn Viterna. 2012. "Resolving the Democracy Paradox: How Democratization Affects Women's Legislative Representation in Developing Nations." *American Sociological Review* 77(3):380-408.
- Franceschet, Susan, and Jennifer M. Piscopo. 2008. "Gender Quotas and Women's Substantive Representation: Lessons from Argentina." *Politics & Gender* 4(3):393-425.
- Frey, R. Scott, and Carolyn Field. 2000. "The Determinants of Infant Mortality in the Less Developed Countries: A Cross-National Test of Five Theories." *Social Indicators Research* 52(3):215-34.

- Goetz, Anne Marie. 2002. "No Shortcuts to Power: Constraints on Women's Political Effectiveness in Uganda." *The Journal of Modern African Studies* 40(4):549-75.
- Goodburn, E. A., J. Hussein, H. Damisoni, and W. Graham. 2001. "Monitoring Obstetric Services: Putting the UN Guidelines into Practice in Malawi." *International Journal of Gynecology & Obstetrics* 74(2):105-17.
- Grey, Sandra. 2002. "Does Size Matter? Critical Mass and New Zealand's Women MPs." *Parliamentary Affairs* 55(1):19-29.
- Hardee, Karen, Kokila Agarwal, Nancy Luke, Ellen Wilson, Margaret Pendzich, Margueritte Farrell, and Harry Cross. 1999. "Reproductive Health Policies and Programs in Eight Countries: Progress Since Cairo." *International Family Planning Perspectives* 25(suppl): S2-9.
- Huber, Evelyne, Francois Nielsen, Jenny Pribble, John D. Stephens. 2006. "Politics and Inequality in Latin America and the Caribbean." *American Sociological Review* 71(6):943-63.
- Huntington, Samuel P. 1991. *The Third Wave: Democratization in the Late Twentieth Century*. University of Oklahoma Press.
- Inglehart, Ronald, and Norris Pippa. 2003. *Rising Tide: Gender Equality and Cultural Change around the World*. Cambridge and New York, NY: Cambridge University Press.
- Inter-Parliamentary Union. 2011. "Women in National Parliaments." Available at: <http://www.ipu.org/wmn-e/classif.htm>
- Kanter, Rosabeth M. 1977. "Some Effects of Proportion on Group Life: Skewed Sex Ratios and Response to Token Women." *American Journal of Sociology* 82(5):965-90.
- Kenworthy, Lane, and Melissa Malami. 1999. "Gender Inequality in Political Representation: A Worldwide Comparative Analysis." *Social Forces* 78:235-68.
- Kittilson, Miki Caul. 2008. "Representing Women: The Adoption of Family Leave in Comparative Perspective." *Journal of Public Economics* 70(2):323-34.
- Levine, Ruth. 2007. *Case Studies in Global Health: Millions Saved*. Sudbury, MA: Jones and Bartlett Publishers.
- Lipton, Michael, and Martin Ravallion. 1995. "Poverty and Policy." *Handbook of Development Economics* 3(2):2551-2657.
- Lovenduski, Joni, and Pippa Norris. 2003. "Westminster Women: The Politics of Presence." *Political Studies* 51(1):84-102.
- Matland, Richard E. 1998. "Women's Representation in National Legislatures: Developed and Developing Countries." *Legislative Studies Quarterly* 23(1):109-25.
- Meyer, Birgit. 2003. "Much Ado About Nothing? Political Representation Policies and the Influence of Women Parliamentarians in Germany." *The Review of Policy Research* 20(3):401-21.
- Navia, Patricio, and Thomas D. Zweifel. 2003. "Democracy, Dictatorship, and Infant Mortality Revisited." *Journal of Democracy* 14(3):90-103.
- Palmer, Alexis, Jocelyn Tomkinson, Charlene Phung, Nathan Ford, Michel Joffres, Kimberly A. Fernandes, Lellei Zeng, Viviane Lima, Julio S. G. Montaner, Gordon H. Guyatt, and Edward J. Mills. 2009. "Does Ratification of Human-Rights Treaties Have Effects on Population Health?" *The Lancet* 373(9679):1987-92.
- Paxton, Pamela. 1997. "Women in National Legislatures: A Cross-National Analysis." *Social Science Research* 26:442-64.
- Paxton, Pamela, and Melanie Hughes. 2007. *Women, Politics, and Power: A Global Perspective*. Thousand Oaks, CA: Sage Publications: Pine Forge Press.
- Paxton, Pamela, and Sheri Kunovich. 2003. "Women's Political Representation: The Importance of Ideology." *Social Forces* 82(1):87-114.
- Pfeiffer, James. 2003. "International NGOs and Primary Health Care in Mozambique: the Need for a New Model of Collaboration." *Social Science & Medicine* 56(4):725-38.

- Pillai, Vijayan K., and Rashmi Gupta. 2006. "Cross-National Analysis of a Model of Reproductive Health in Developing Countries." *Social Science Research* 35(1):210-27.
- Poggione, Sarah. 2004. "Exploring Gender Differences in State Legislators' Policy Preferences." *Political Research Quarterly* 57(2):305-14.
- Przeworski, Adam, Michael E. Alvarez, Jose Antonio Cheibub, and Fernando Limongi. 2000. *Democracy and Development: Political Institutions and Well-Being in the World, 1950–1990*. New York, NY: Cambridge University Press.
- Roberts, Wade T. 2005. "The Uneven Globalization of Civil Society Organizations and the Consequences for Cross-National Disparities in Human Development." *International Journal of Sociology and Social Policy* 25(1/2):118-142.
- Roemer, Milton I., and Ruth Roemer. 1990. "Global Health, National Development, and the Role of Government." *American Journal of Public Health* 80(10):1188-92.
- Ross, Michael. 2006. "Is Democracy Good for the Poor?" *American Journal of Political Science* 50(4):860-74.
- Sadasivam, Bharati. 1999. "Risks, Rights and Reforms: A 50 Country Survey Assessing Government Actions Five Years After the International Conference on Population and Development." *New York, Women's Environment and Development Organization*.
- Safaei, Jalil. 2006. "Is Democracy Good for Health?" *International Journal of Health Services* 36(4):767-86.
- Sater, James N. 2007. "Changing Politics from Below? Women Parliamentarians in Morocco." *Democratization* 14(4):723-42.
- Scanlan, Stephen J. 2010. "Gender, Development, and HIV/AIDS: Implications for Child Mortality in Less Industrialized Countries." *International Journal of Comparative Sociology* 51(3):211-32.
- Schwindt-Bayer, Leslie A. 2006. "Still Supermamas? Gender and the Policy Priorities of Latin American Legislators." *American Journal of Political Science* 50(3):570-85.
- Schwindt-Bayer, Leslie A., and William Mishler. 2005. "An Integrated Model of Women's Representation." *Journal of Politics* 67(2):407-28.
- Sen, Amartya. 1999. *Development as Freedom*. New York, NY: Alfred A. Knopf.
- Shandra, John M., Bruce London, and John B. Williamson. 2003. "Environmental Degradation, Environmental Sustainability, and Overurbanization in the Developing World: A Quantitative, Cross-National Analysis." *Sociological Perspectives* 46(3):309-29.
- Shandra, John M., Jenna Nobles, Bruce London, and John B. Williamson. 2004. "Dependency, Democracy, and Infant Mortality: a Quantitative, Cross-National Analysis of Less Developed Countries." *Social Science & Medicine* 59(2):321-33.
- Shandra, John M., Carrie L. Shandra, and Bruce London. 2010. "Debt, Structural Adjustment, And Non-Governmental Organizations: A Cross-National Analysis Of Maternal Mortality." *American Sociological Association* 16(2):217-45.
- Shen, Ce, and John Williamson. 2001. "Accounting for Cross-National Differences in Infant Mortality Decline (1965-1991) among less Developed Countries: Effects of Women's Status, Economic Dependency, and State Strength." *Social Indicators Research* 53(3):257-88.
- Solomon, Yodit, Bonnie Ballif-Spanvill, Carol Ward, Addie Fuhrman, and Kacey Widdison-Jones. 2008. "The Dynamics of Community and NGO Partnership: Primary Health Care Experiences in Rural Mali." *Promotion & Education* 15(4):32-7.
- Subbarao, Kalanidhi, and Laura Raney. 1995. "Social Gains from Female Education: a Cross-National Study." *Economic Development and Cultural Change* 44:105-28.
- Swers, Michele L. 1998. "Are Congresswomen More Likely to Vote for Women's Issue Bills Than Their Male Colleagues?" *Legislative Studies Quarterly* 23(3):435-48.
- Thomas, Sue. 1991. "The Impact of Women on State Legislative Policies." *Journal of Politics* 53(4):958-76.
- United Nations Equal Opportunities Commission. 2003. "United Nations Targets for Proportion of Women in Leadership and Decision-Making Positions." Information Paper.

- Valdez, Joseph Jerome, Jerald Hage, and William Vargas. 2005. "Understanding the Relationship of Maternal Health Behavior Change and Intervention Strategies in a Nicaraguan NGO Network." *Social Science & Medicine* 61(6):1356-68.
- Victoria, Cesar G., Adam Wagstaff, Joanna Armstrong Schellenberg, Davidson Gwatkin, Mariam Claeson, and Jean-Pierre Habicht. 2003. "Applying an Equity Lens to Child Health and Mortality: More of the Same Is Not Enough." *The Lancet* 362(9379):233-41
- Viterna, Jocelyn, Kathleen Fallon, and Jason Beckfield. 2008. "How Development Matters: A Research Note on the Relationship Between Development, Democracy and Women's Legislative Representation." *International Journal of Comparative Sociology* 49(6):455-76.
- Wang, Guang-Zhen. 2004. "Reproductive Health in the Context of Economic and Democratic Development." *Comparative Sociology* 3(2):135-62.
- Wejnert, Barbara. 2008. "Effects of Global Democracy on Women's Reproductive Health: 1970-2005, Cross-World Analysis." *Marriage & Family Review* 44(2-3):154-72.
- Wimberley, Dale W. 1990. "Investment Dependence and Alternative Explanations of Third World Mortality: A Cross-National Study." *American Sociological Review* 55(1):75-91.
- World Bank. 2010. World development indicators. Washington, DC: World Bank.

