Women in cabinet and public health spending: Evidence across countries

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Astghik Mavisakalyan[*†]

Abstract

This article studies the effect of women's cabinet representation on public health policy outcomes. Based on a large sample of countries in the year 2000, the analysis shows that an increase in the share of women in cabinet is associated with an increase in public health spending. There is also an indication of a decrease in the gender gap in life expectancies in places with higher cabinet representation of women. The endogeneity of women's cabinet representation is accounted for by using the share of daughters that a national leader parents as an instrument.

Keywords: female policy makers; public health spending; parenting daughters.
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1. INTRODUCTION

There appear to be gender differences in policy preferences. In particular, studies have shown that women prioritise health more than men do (e.g. Shapiro and Mahajan, 1986; Funk and Gathmann, 2008).[3] These differences in policy preferences of women and men may translate into changes in health policy if women's representation in public policy-making roles increases.[4] Due to their superior understanding of women's preferences, women policy-makers may contribute to an increase of policy responsiveness to women's preferences. In addition, female policy-makers' own preferences may affect policy decisions (e.g. Besley and Case, 2003; Chattopadhyay and Duflo, 2004). This intuition is supported by recent studies that document a positive relationship between women's representation in legislative power and allocation of public resources to health (Rehavi, 2007; Chen, 2010).[5]

While there is an extensive literature on women's representation in legislative power, comparative analysis of women in executive branches of governments is rather limited (Siaroff, 2000). Relatively little is known about the consequences for policy of women's representation in

[3] One explanation for women's higher prioritisation of health is their traditional role as primary caregivers, in which they directly feel "the pinch of tighter budgets and the pain of inadequate health care" (Carpini and Fuchs, 1993). A more recent explanation for women's continuing higher preference for social spending in general focuses on delayed marriages and increases in divorce rates that result in reduction of private transfers from men to women (Edlund and Pande, 2002; Edlund *et al.*, 2005).

[4] Increased representation of women in the electorate is another mechanism through which gender differences in preferences may translate into changes in policies. Indeed, there is evidence of increased public health spending in response to women's enfranchisement (e.g. Lott and Kenny, 1999; Aidt *et al.*, 2006; Miller, 2008).

[5] A closely related strand of literature identifies a positive relationship between female share of elected representatives and other dimensions of social policy, including introduction of bills and legislations advancing interests of women, children and families (e.g. Thomas, 1991; Berkman and O'Connor, 1993; Schwindt-Bayer and Mishler, 2005; Schwindt-Bayer, 2006; Svaleryd, 2009).

cabinets worldwide, even though they are among the most powerful political positions (Studlar and Moncrief, 1999). Public spending is ultimately a result of the cabinet's decision making in the budget process, which is approved by the legislature. Cabinets across countries therefore have a significant influence over health policy initiation and construction. Furthermore, since cabinet ministers, unlike parliamentarians, are normally appointed positions they may have weaker disincentives to act according to their own interests. As a result, the identity, including the gender, of cabinet members may potentially be of greater importance for policy than that of legislatures. To demonstrate the significant role of women in cabinet, Atchison and Down (2009) document their effect on female-friendly social policies across countries. This study contributes to this strand of literature by studying the effect of women's cabinet representation on public health spending.

Reliable estimation of the effect of women's representation in policy-making roles is challenging for a number of reasons. Policy environment, and public health spending in particular, may have broad effects on women's participation in socio-economic life. In addition to this reverse causality problem, countries that differ for various unobserved reasons may differ both with regards to women's political representation and policy outcomes. Some of the micro-level studies on female elected representatives have exploited electoral outcomes (e.g. Clots-Figueras, 2007; Rehavi, 2007) and reservation policies (e.g. Chattopadhyay and Duflo, 2004) to identify their effect on various policies. Macro-level studies examining the impact of women's political representation in a range of contexts across countries have often neglected the problem of endogeneity (e.g. Dollar *et al.*, 2001; Swamy *et al.*, 2001). In a study of the impact of women's representation in legislative power on policy outcomes including health spending, Chen (2010) used gender quotas on representation of female legislators as an instrument for the proportion of female legislators across countries. However, the exogeneity of gender quotas in parliaments is questionable given that their introduction is likely to be a consequence of the state of women's representation.

This paper utilises a novel identification strategy by instrumenting women's representation in cabinet with the share of daughters that a national leader parents.[6] First,

[6] National leader is the effective leader of a country, defined by Goemans *et al.* (2009) as the person de facto exercising power in a country.

national leaders have important mandates over the recruitment of cabinet members (e.g. Amorim Neto and Strom, 2006; Kang, 2009). Second, having daughters may make parents more sensitive to gender equity issues due to a resulting attitudinal shift (e.g. Warner, 1991; Warner and Steel, 1999) or through the realisation of their effect on their daughters' well-being (Doepke and Tertilt, 2009). In support of this intuition, it has been shown that parenting daughters increases legislators' propensity to vote liberally on women's issues bills (Washington, 2008). Based on these premises, it is hypothesized that national leaders who parent daughters may be more likely to appoint and work together with women in cabinet.

Using this instrumental variable approach, women's representation in cabinet is found to cause an increase in public health spending across a large sample of countries in the year 2000. The estimates imply that increasing women's representation in cabinet in a country like Venezuela where there are no women in cabinet, to the level of Sweden where women are a majority (55%), will lead to a 4.4% point increase in Venezuela's share of public health spending (the actual difference in the shares of health spending between the two countries is 3.5% point). Furthermore, the results suggest that women's representation in cabinet contributes to closing the gender gap in life expectancies.

The first stage results indicate that women's representation in cabinet is significantly higher in countries whose leaders parent a higher proportion of daughters. The exclusion restriction implied by the instrumental variable approach is that the share of daughters that a national leader parents has no effect on public health spending, other than through its effect on women's representation in cabinet. One concern with this exclusion restriction is that the instrumental variables estimates may be capturing the effect of parenting daughters on public health spending, however working through other channels than assumed. In particular, having more daughters may shape preferences of national leaders in a more general way, leading to alternative organisational features that would affect public spending. Oswald and Powdthavee (2010) demonstrate that having daughters leads people to be more sympathetic to left-wing parties. The national leader parenting daughters may then form more left-wing cabinets which in turn may increase public health spending. To address this concern, measures of political orientation of the national leader's party are included as controls. This does not overturn the results.

A further concern for exclusion restriction is that national leaders parenting daughters may directly affect public health spending, if it benefits women more. In this case, the instrumental variables estimates may be assigning the effect of parenting daughters to women in cabinet. However, this is unlikely to be the case. Agreement on budgetary parameters is normally reached through negotiations in the cabinet budgeting process (von Hagen and Harden, 1995; Hallerberg and von Hagen, 1999). Therefore, it is an outcome of combined preferences of cabinet members who need to agree on the parameters. That the effect of parenting daughters is likely to operate through the channel of women's cabinet representation is also supported by the results of an overidentification test.

The following section outlines the empirical approach. Section 3 presents the results, and Section 4 concludes.

2. EMPIRICAL APPROACH AND DATA

Public health expenditures and women's representation in cabinet do not often change much over short periods of time. Therefore, the empirical analysis employs a cross-section of countries in 2000 instead of a panel data set. This has the advantage of having a larger dataset of countries to work with. The dependent variable is the share of expenditures on public health in GDP. Women's cabinet representation is defined as the share of women in cabinet at the ministerial level.

It is difficult to identify the effect of women's cabinet representation on public health spending because of the problems of reverse causality and omitted variables mentioned in the introduction. As these possibilities might potentially lead to a bias in estimates, 2SLS is used as a base estimation strategy. The new instrumental variable proposed to deal with the endogeneity of women's cabinet representation is the share of daughters parented by the national leader (following Goemans *et al.* (2009), effective leaders of countries are considered[7]). Table 1 documents the data on leaders' children and women's cabinet representation. As shown in the bottom of the table, the share of national leader's daughters and women's representation in

[7] In parliamentary regimes, these are the prime ministers, in presidential systems - presidents. See Goemans *et al.* (2009) for the details on categorisation of effective leaders.

cabinet, are positively and highly significantly correlated.

The relationship between the public health expenditures share of GDP and women's cabinet representation is examined in a regression framework, which includes a set of important controls. To maximise the validity of the instrumental variable strategy, a range of other characteristics of leaders are controlled for. These include the gender and age of the national leader and the total number of children they have. It has been suggested that having daughters shifts parental preferences towards the left of the political spectrum (Oswald and Powdthavee, 2010). In that case, countries where national leaders have more daughters may spend more on public health without this being driven by the share of women in cabinet. To address this concern, measures of the political orientation of the national leader's party, dummies for right and centrist parties, are added as a control.[8]

Features of political systems are related to their redistribution policies (e.g. Persson and Tabellini, 1999; Mulligan *et al.*, 2004). Some also bear important implications for cabinet processes and composition, including women's representation. To minimise the possibility of an omitted variable bias, measures for systems of government and the degree of democratisation are included in the list of controls. "Parliamentary system" is a dummy taking 1 if a country has a parliamentary system and 0 if the system of government is presidential. "Democracy" is defined based on polity scores of 0 (least democratic) to 10 (most democratic) (Marshall and Jaggers, 2009). To express historical differences across countries that could potentially affect gender composition of cabinets as well as their preferences for redistribution, controls for both

[8] Parties that are defined as conservative, Christian democratic, or right-wing are categorised as right in our data source (Beck *et al.*, 2001). Centrist parties are those defined as centrist or when party position can best be described as centrist (e.g. party advocates strengthening private enterprise in a social-liberal context). Omitted category includes parties that are defined as communist, socialist, social democratic, or left-wing as well as all those cases which do not fit into the mentioned categories (i.e. party's platform does not focus on economic issues, or there are competing wings).

countries' democratic traditions (as captured by the age of democracy[9]) and their former British and French colonial status are included.

I further isolate the relationship between women's cabinet representation and public health spending by accounting for socio-economic heterogeneity across countries. Richer countries can afford to devote more resources to health. Therefore, public health expenditures are expected to depend on income differences, captured by the logarithm of GDP per capita. Exposure to external risk may have broad impacts on demand and the size of government (Rodrik, 1998). Accordingly, the openness of a country, measured as the sum of exports and imports in GDP, is included in the list of controls. Furthermore, I control for countries whose revenues derive primarily from oil exports (following Fearon and Laitin (2003) I distinguish across countries whose fuel exports exceed one-third of export revenues and others).

A measure of size (logarithm of population) is included to represent the effective demand and the costs of supporting health systems. Furthermore, urban and migrant shares of population are controlled for. Protestant, Catholic, Muslim and Hindu shares of the population are included as controls to further capture the heterogeneity of preferences in the population. Finally, five regional dummy variables (for Eastern Europe and the Former Soviet Union, Asia, North Africa and the Middle East, Sub-Saharan Africa, Latin America and the Caribbean) are added (Western democracies are the omitted category).

As the second column of Table 2 shows, most variables come from standard sources widely used in macro-level empirical studies. In some cases, datasets compiled by other researchers based on standard sources and used in published papers, are used. In the case of some variables, the data are collected based on multiple sources. In particular, given the multiple missing values for women's cabinet representation as of 2000, I had to rely on information as of 1998 from the same source to fill those values (around 20% of observations in the sample). Since the remaining of variables, including those on leaders' characteristics were measured as of 2000, I made sure that the missing data on women's cabinet representation were filled with 1998 values only for countries which had the same leaders as of 1998. In the robustness checks, I

[9] This measure comes from Enikolopov and Zhuravskaya (2007) who take the number of years since the democratic regime has been established for the last time as reported in Polity IV data base as a proxy for the age of democracy.

demonstrate that the results are insensitive to removing the observations with the 1998 data on women's cabinet representation from the sample. Information on the children of national leaders is collected based on multiple publicly available biographical sources (e.g. websites of national leaders, Encyclopedia of the Nations (2011), etc.).[10]

The assembled dataset covers up to 80 countries in 2000 in the base specification. Table 2 contains summary statistics for the main variables. The average public expenditures on health constitute around 3.63 percent of country's GDP, ranging from 0.6 percent (Indonesia) to 8.1 percent (Israel). Women's representation in cabinet across countries ranges from zero (Armenia, Brazil, Jordan, Moldova, Mozambique and Venezuela) to 55 percent (Sweden) with the average representation of women in cabinet being around 15.03 percent. Finally, slightly more than half of average national leader's children are daughters.

3. RESULTS

3.1. OLS regressions of public health spending

Table 3 reports OLS regressions of the share of public health spending in GDP on the share of women in cabinet with different sets of other controls. Column (1) demonstrates that in the sample of 125 countries there is a strong positive correlation between women's cabinet representation and public health spending. Column (2) shows that this effect, while smaller in size, is preserved after region dummies are controlled for. Columns (3)-(6) report regressions with various groups of controls. These include leaders' characteristics as well as sets of variables capturing political, economic and demographic characteristics of countries. In the final column, all of these controls are jointly included in the regression. The coefficient on women's cabinet representation preserves its significance throughout these models.

Next, I report OLS regressions in a variety of samples. The positive significant partial correlation between women's cabinet representation and public health spending also holds for our base sample (which is arrived at through further constraining observations to those with non-missing values on national leaders' daughters), as the results reported in column (1) of Table 4

[10] Countries which experienced a leadership change in 2000 are excluded from the sample.

demonstrate. The estimates further indicate a negative effect of centrist parties in power on public health spending. Countries whose revenues derive primarily from oil exports spend lower share of their GDP on health. In contrast, the higher immigrant share of population is associated with significantly higher public health spending. The coefficients on the remaining controls are not significantly different from zero.

Two countries in the sample, Bangladesh and Sri Lanka, had female national leaders in 2000. Column (2) demonstrates that the results are robust to exclusion of these countries from the sample. In columns (3) and (4) I check the sensitivity of results to the presence of formally detected influential observations. According to Donald and Maddala (1993), examination of studentised residuals is the most appropriate method to identify influential observations, even when assessing the influence of observations on individual estimated coefficients. On the basis of studentised residuals, 6 countries are identified as being potentially influential observations. When the model is re-estimated with these countries omitted, the coefficient on women's cabinet representation preserves its significance (column (3)). DFbeta is a more specific measure of influence that assesses how each coefficient is changed by dropping the observation. I apply it to exclude influential observations in estimation in Column (4). The significance of the results remains robust to this change in the sample.

Data on women's cabinet representation for some of the countries is from the year 1998, as there were missing values in the year 2000. Column (5) of Table 4 reports the results based on the dataset restricted to year 2000 observations on women's cabinet representation. The results are similar to those in the base sample.

In summary, the data provide evidence that places with higher representation of women in cabinet spend more on public health spending. Next, I provide estimations that take into account the concerns over endogeneity of women's cabinet representation.

3.2. IV regressions of public health spending

This paper applies a novel identification strategy to deal with the endogeneity of women's cabinet representation. I hypothesize that the share of daughters parented by the national leader affects women's cabinet representation, and through it, public health spending. In the second and third columns of Table 5 I demonstrate that this may indeed be how these relationships operate.

The second column reports the results of regression of the share of daughters parented by national leader on public health spending which excludes women's cabinet representation. The coefficient on the share of daughters is significant albeit marginally. However, it turns insignificant once women's cabinet representation is controlled for in the third column, suggesting that the later may be the mechanism linking the share of daughters parented by national leader and public health expenditures.

Next, I exploit the share of daughters parented by the national leader to identify the effect of women's cabinet representation on public health spending using 2SLS regression. The fourth column of Table 3 shows that the coefficient on women's representation in cabinet is statistically significant and larger in magnitude as compared to OLS estimates. It indicates that a 10 percentage point increase in women's representation in cabinet, leads to 0.8 percentage point increase in public health expenditures. This estimate implies, for example, that increasing women's representation in cabinet in Venezuela (0%) to the level of Sweden (55%), will lead to around 4.4% point increase in Venezuela's share of public health spending (the actual difference is 3.5% point). As in the OLS regressions, having centrist parties in power, reliance on oil exports and higher share of immigrant population are significantly associated with public health spending.

The results of the first-stage regressions reported in the last column of Table 5 show a strong positive relationship between the share of daughters that a national leader parents and women's representation in cabinet. A 1 percentage point increase in the share of the daughters that a national leader parents is associated with a 0.11 percentage point increase in the representation of women in cabinet. This association is highly statistically significant. The first-stage estimates also indicate that less democratic countries have more women in cabinet. This result, however, is driven by outliers. Indeed, removing Belarus, Colombia and Zimbabwe from the sample (identified based on DFbetas) turns the coefficient on democracy positive but insignificant. Countries with longer history of democracy have higher representation of women in cabinet. Conversely, the coefficient on oil dummy is negative. This is consistent with previous findings on the negative effect of oil production on women's labour force participation (Ross, 2008). Literature has documented a positive effect of protestant religion on labor force participation of women (e.g. Feldmann, 2007). Similarly, I find that places with higher protestant share of population also have higher representation of women in cabinet. Coefficients on the

remaining controls are insignificant.

An important criterion for an instrument is also for it to affect the dependent variable only through its effect on the treated endogenous variable. While I argued in the introduction that the instrument used in this study appears to satisfy this condition, I consider additional controls that could plausibly be correlated with both the leader's share of daughters and public health spending and check whether their inclusion affects the estimates. Parenting daughters may have broad effects on the ideology of the leader. As Oswald and Powdthavee (2010) demonstrate, having daughters leads people to be more sympathetic to left-wing parties. Then, it may be that parenting daughters leads to increase in public health spending through channels other than gender composition of the cabinet. To address this issue, I controlled for the right and centrist political orientations of leader's party in the regressions. In Table 6 I additionally include dummies for nationalist and regional parties (sourced from Beck *et al.*, 2001). This leaves the results unaffected. Previous studies have demonstrated a positive relationship between women's representation in legislative power and public health spending (Rehavi, 2007; Chen, 2010). Given the linkages between different spheres of government, it is worthwhile considering the effect of controlling for women's parliamentary representation on the results. As the fourth column of Table 6 shows, women's share of parliament is significantly positively associated with public health spending. The size of this effect is smaller than that of the women's share of cabinet, which remains significant. However, this result should be treated with caution, given the endogeneity of women's parliamentary representation which I do not address.

In the last two columns of Table 6 I further investigate the validity of the identification strategy using an overidentification test. To be able to do that, I augment the model with an additional instrument, the presence of a state religion in a country (sourced from Barro, 2007). Religion can influence women's employment given that some religions may discourage egalitarianism (e.g., Bainbridge and Hatch, 1982; Lehrer, 1995). Places with state religion may experience a stronger influence and involvement of religious institutions on government affairs. As a result, an adverse effect of state religions on women's representation in government can be expected. In the first-stage, while the share of daughters preserves its significant positive effect on the share of women in cabinet, the presence of state religion, as hypothesized, has a negative effect on it. The coefficients are jointly significant at the 1% level. The results of the overidentification test are reported in the last row of Table 6. They show no evidence for a direct

effect of the share of daughters that a national leader parents on public health spending.

In summary, after addressing the endogeneity concerns, I confirm that an increase in women's representation in cabinet leads to an increase in expenditures on public health. The instrument used to deal with the endogeneity of women's cabinet representation appears to be valid.

3.3. IV regressions with different dependent variables

In Table 7 I address additional questions related to the identified link between women's cabinet representation and public health spending. First, do places with higher representation of women in cabinet also have larger governments? Column (1) reports the results of regressions where the dependent variable is the government share of GDP. The coefficient on the share of women in cabinet is insignificant (while the coefficient on male national leader dummy is negative and significant). Public health spending may also increase as a result of redistribution of resources between different spending categories. In unreported results, the effect of women's cabinet representation on the shares of education and military spending was considered. However, in both cases the coefficients on the share of women in cabinet were insignificant. While we can plausibly suggest the possibility that in places with higher representation of women in cabinet public health spending increases at the cost of decreased spending in other directions, we are not able to identify what those directions are.

Differences across countries in resources devoted to public health were captured by the share of expenditures on health in GDP. Of further interest is to consider whether women's cabinet representation actually affects the quality of public health system. Column (2) reports regressions where the dependent variable is health expenditure per capita in PPP measured in 100 (constant 2005 international) dollars (World Bank, 2012). According to the results, a 10 percentage point increase in women's representation in cabinet increases health expenditure per capita by 208 dollars. In the context of the previously used example, this result implies that increasing women's representation in cabinet in Venezuela (0%) to the level of Sweden (55%) will result in an increase in public health expenditures per capita of 1145 dollars (the actual difference is around 1812).

Another interesting question in the context of women's cabinet representation and public

health quality is whether the changes associated with women's cabinet representation are more favourable to women. The only gender-disaggregated measure available in this study is life expectancy. In column (3) of Table 7, I consider the 2000-2001 growth rate of gender gap in life expectancies (measured as the ratio of female to male life expectancies). In an average country in the sample women have a higher life expectancy than men (the gender gap measure if above 1). Therefore, the significant negative coefficient on women's share of cabinet in column (3) indicates the absence of female bias in health policy effects of women cabinet members.

4. SUMMARY

Using a dataset of 80 countries in the year 2000, this study quantified the implications of women's cabinet representation for public health policy outcomes. The key finding is that a higher share of women in cabinet is associated with higher public health spending. The results also suggest that a higher share of women in cabinet leads to lowering the gender gap in life expectancies. A novel identification strategy to study the causal effect of women in cabinet was proposed to deal with the concern of endogeneity. The share of daughters parented by a country's national leader appeared to be an important determinant of women's cabinet representation.

Admittedly, more work needs to be done in order to get deeper insights, but these results ultimately suggest that manipulation of the gender identity of cabinet members could have important effects on health policy and outcomes. Quotas to increase women's representation in political life have been increasingly introduced in different parts of the world. The results of this study suggest that they may also have implications for health outcomes in those places.

Tables

Table 1 Data on national leaders' children and women's cabinet representation

Country	National leader	Num child	Sh daughters	Sh women in cab
Angola	José Eduardodos Santos	7	42.86	14.7
Argentina	Fernando De La Rúa	3	33.33	7.3
Armenia	Robert Kocharian	3	33.33	0
Australia	John Winston Howard	3	33.33	19.5
Azerbaijan	Heydar Aliyev	2	50	2.6
Bangladesh	Hasina Wazed	2	50	9.5
Belarus	Alexander Lukashenko	2	0	25.7
Belgium	Guy Verhofstadt	2	50	18.5
Bolivia	Banzer Suarez	5	60	6
Botswana	Festus Mogae	3	100	26.7
Brazil	Fernando Henrique Cardoso	3	66.67	0
Bulgaria	Ivan Kostov	2	100	18.8
Burkina Faso	Blaise Compaoré	1	100	8.6
Cambodia	Hun Sen	6	50	7.1
Cameroon	Paul Biya	3	33.33	5.8
Canada	Jean Chretien	3	33.33	24.3
China	Jiang Zemin	2	0	5.1
Colombia	Andrés Pastrana Arango	3	66.67	47.4
CostaRica	Miguel Rodríguez Echeverría	3	33.33	28.6
Croatia	Stjepan Mesic	2	100	16.2
Cuba	Fidel Castro	9	22.22	10.7
Czech Rep	Milos Zeman	2	50	17
Denmark	Nyrup Rasmussen	3	100	45
Egypt	Hosni Mubarak	2	0	6.1
El Salvador	Francisco Flores	2	50	15.4
Eritrea	Isaias Afwerki	3	33.33	11.8
Estonia	Mart Laar	2	50	14.3

Ethiopia	Meles Zenawi	3	66.67	22.2
France	Jacques Chirac	2	100	37.9
Gambia	Yahya Jammeh	1	100	30.8
Georgia	Eduard Shevardnadze	2	50	9.7
Germany	Gerhard Schroder	1	100	35.7
Ghana	Jerry Rawlings	4	75	8.6
Greece	Costas Simitis	2	100	7.1
Haiti	Rene Preval	2	100	18.2
Honduras	Flores Facusse	2	50	33.3
Hungary	Viktor Orban	5	80	35.9
Indonesia	Abdurrahman Wahid	4	100	5.9
Iran	Mohammad Khatami	3	66.67	9.4
Ireland	Bertie Ahern	2	100	18.8
Israel	Ehud Barak	3	100	6.1
Jordan	Abdullah II Bin Al-Hussein	3	66.67	0
Kazakhstan	Nursultan Nazarbayev	3	100	17.5
Kenya	Daniel Arap Moi	8	37.5	1.4
Kyrgyzstan	Askar Akayev	4	50	4
Lao PDR	Khamtay Siphandone	5	60	10.2
Libya	Muammar Qaddafi	10	20	12.5
Macedonia FYR	Ljubco Georgievski	1	0	10.9
Malaysia	Mahathir Bin Mohammad	7	42.86	16
Mauritius	Anerood Jugnauth	2	50	9.1
Moldova	Petru Lucinschi	2	0	0
Mongolia	Natsagiin Bagabandi	2	50	10
Mozambique	Joaquim Chissano	4	50	0
Namibia	Sam Nujoma	4	25	16.3
Nepal	Girija Prasad Koirala	1	100	14.8
Nicaragua	Arnoldo Aleman	4	50	23.1
Philippines	Joseph Estrada	8	25	10
Poland	Aleksander Kwasniewski	1	100	18.7

Portugal	Jorge Sampaio	2	50	9.7
Rep of Korea	Kim Dae Jung	3	0	6.5
Senegal	Abdoulaye Wade	2	50	15.6
Sierra Leone	AhmadTejan Kabbah	5	40	8.1
Slovakia	Mikulas Dzurinda	2	100	19
Spain	Jose Maria Aznar	3	33.33	17.6
Sri Lanka	Chandrika Kumaratunga	2	50	13
Sweden	Goran Persson	2	100	55
Tajikistan	Emomali Rakhmonov	9	77.78	6
Tanzania	Benjamin Mkapa	2	0	13
Thailand	Chuan Leekpai	1	0	5.7
Trinidad&Tobago	Basdeo Panday	4	100	8.7
Tunisia	Zine El Abidine Ben Ali	6	83.33	10
Turkmenistan	Saparmurat Niyazov	2	50	4
Uganda	Yoweri Museveni	4	75	27.1
Ukraine	Leonid Kuchma	1	100	5
United Kingdom	Tony Blair	4	25	33.3
United States	Bill Clinton	1	100	31.8
Uzbekistan	Islam Karimov	3	66.67	4.4
Venezuela	Hugo Chavez	4	75	0
Zambia	Frederick Chiluba	11	45.45	6.2
Zimbabwe	Robert Mugabe	3	66.67	36

Correlations (N=80)	
	Sh women in cab
Sh daughters	0.31***

*** denotes significance at 1 percent level.

Table 2 Summary statistics (N=80)

Variable	Source	Mean	Std. dev.	Min	Max
Health spending sh	UNDP (2003)	3.63	1.88	0.6	8.1
Sh women in cab	United Nations (2000); UNDP (2002)	15.03	11.86	0	55
Sh daughters	Various bio sources	58.07	31.87	0	100
Num child	Various bio sources	3.3	2.15	1	11
Male leader	Goemans *et al.* (2009)	0.98	0.16	0	1
Age leader	Goemans *et al.* (2009)	58.11	10.90	34	77
Right party	Beck *et al.* (2001)	0.21	0.41	0	1
Center party	Beck *et al.* (2001)	0.08	0.27	0	1
Parliamentary syst	Beck *et al.* (2001)	0.33	0.47	0	1
Democracy	Marshall and Jaggers (2009)	5.59	3.86	0	10
Democracy age	Enikolopov and Zhuravskaya (2007)	12.6	28.01	0	169
British colony	CIA (2010)	0.26	0.44	0	1
French colony	CIA (2010)	0.09	0.28	0	1
GDP per capita	Heston *et al.* (2006)	8.51	1.10	6.24	10.44
Openness	World Bank (2004)	85.10	42.42	22.4	228.88
Oil	Fearon and Laitin (2003)	0.11	0.32	0	1
Population	Heston *et al.* (2006)	16.41	1.35	13.93	20.96
Urban sh	UNESCO (2007); United Nations (2007a)	54.37	22.34	12	97.1
Migrant sh	United Nations (2007b)	5.97	7.27	0	39.1
Protestant sh	Barro (2007)	9.965	15.94	0	87.8
Catholic sh	Barro (2007)	28.15	33.82	0	94.3
Muslim sh	Barro (2007)	21.33	31.82	0	98.9
Hindu sh	Barro (2007)	2.32	10.22	0	76.7

Table 3 OLS regressions of public health spending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sh women in cab	0.07***	0.04***	0.03**	0.03**	0.02**	0.03***	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Num child			-0.03				0.01
			(0.06)				(0.05)
Male leader			0.30				-0.12
			(0.80)				(0.80)
Age leader			-0.00				0.01
			(0.01)				(0.01)
Right party			0.69**				0.12
			(0.33)				(0.34)
Center party			-0.55				-0.93*
			(0.51)				(0.47)
Parliamentary syst				-0.22			0.15
				(0.32)			(0.38)
Democracy				0.11***			0.04
				(0.04)			(0.05)
Democracy age				0.00			-0.00
				(0.01)			(0.01)
British colony				-0.30			-0.48
				(0.29)			(0.36)
French colony				-0.35			-0.25
				(0.37)			(0.41)
GDP per capita					0.52***		0.26
					(0.16)		(0.27)
Openness					0.00		-0.00
					(0.00)		(0.00)
Oil					-1.23***		-1.07**
					(0.36)		(0.42)
Population						-0.14*	-0.08

						(0.08)	(0.12)
Urban sh						0.01	0.01
						(0.01)	(0.01)
Migrant sh						-0.00	0.06**
						(0.01)	(0.02)
Protestant sh						-0.00	-0.01
						(0.01)	(0.01)
Catholic sh						0.00	0.01
						(0.01)	(0.01)
Muslim sh						-0.01***	-0.01
						(0.00)	(0.01)
Hindu sh						-0.01	-0.02
						(0.01)	(0.01)
Constant	2.36***	5.05***	4.98***	4.37***	-0.19	6.72***	1.95
	(0.21)	(0.45)	(1.14)	(0.60)	(1.58)	(1.62)	(3.12)
Region effects	No	Yes	Yes	Yes	Yes	Yes	Yes
No of obs	125	125	106	121	117	123	97
R-sq	0.23	0.54	0.56	0.61	0.63	0.62	0.74

* denotes significance at 10 percent level; ** at 5 percent level; *** at 1 percent level.

Table 4 OLS regressions of public health spending on different samples

	(1)	(2)	(3)	(4)	(5)
Sh women in cab	0.03*	0.03*	0.04***	0.03**	0.03*
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Num child	-0.02	-0.02	0.03	0.05	0.06
	(0.08)	(0.08)	(0.07)	(0.07)	(0.10)
Male leader	-0.54		-0.79	-1.29	-0.83
	(1.06)		(0.81)	(0.88)	(1.52)
Age leader	0.01	0.01	0.01	0.00	0.01
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Right party	-0.16	-0.18	0.09	-0.18	-0.35
	(0.39)	(0.39)	(0.29)	(0.33)	(0.43)
Center party	-1.28**	-1.30**	-0.53	-1.20***	-1.25**
	(0.54)	(0.55)	(0.44)	(0.44)	(0.59)
Parliamentary syst	0.14	0.09	0.46	0.28	-0.08
	(0.43)	(0.46)	(0.32)	(0.35)	(0.52)
Democracy	0.02	0.01	0.04	0.00	0.05
	(0.06)	(0.07)	(0.05)	(0.06)	(0.07)
Democracy age	-0.00	-0.00	-0.00	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
British colony	-0.67	-0.67	-0.72**	-0.91**	-0.67
	(0.42)	(0.42)	(0.32)	(0.36)	(0.45)
French colony	-0.38	-0.37	-0.59	-0.29	-0.39
	(0.54)	(0.55)	(0.44)	(0.48)	(0.55)
GDP per capita	0.44	0.45	0.32	0.43	0.27
	(0.33)	(0.33)	(0.27)	(0.30)	(0.38)
Openness	-0.00	-0.00	-0.01*	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Oil	-1.33***	-1.32***	-1.09***	-1.51***	-1.80***
	(0.49)	(0.49)	(0.39)	(0.42)	(0.54)
Population	-0.19	-0.19	-0.15	-0.27**	-0.12

	(0.14)	(0.14)	(0.12)	(0.12)	(0.16)
Urban sh	0.01	0.01	0.01	0.03**	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Migrant sh	0.07**	0.07**	0.09***	0.09***	0.08***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Protestant sh	-0.01	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Catholic sh	0.01	0.01	0.01**	0.01*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Muslim sh	-0.00	-0.00	-0.01	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Hindu sh	-0.02	-0.02	-0.02	-0.04	-0.02
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
Constant	2.39	1.93	2.43	3.82	1.94
	(3.59)	(3.53)	(2.99)	(3.02)	(4.51)
Region effects	Yes	Yes	Yes	Yes	Yes
No of obs	80	78	74	74	66
R-sq	0.76	0.75	0.87	0.85	0.81

(1) base sample defined based on the availability of data on all measures of interest, including the instrument; (2) removes countries with female leaders; (3) removes influential observations based on studentised residuals; (4) removes influential observations based on DFBETAs; (5) removes observations based on 1998 data on women's cabinet representation; *denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

Table 5 Addressing endogeneity of women's cabinet representation in public health spending regressions

	OLS	OLS	2SLS	1st stage
Sh women in cab		0.02	0.08**	
		(0.02)	(0.04)	
Sh daughters	0.01*	0.01		0.11***
	(0.00)	(0.01)		(0.04)
Num child	-0.05	-0.03	0.03	-0.98
	(0.08)	(0.08)	(0.08)	(0.59)
Male leader	-0.55	-0.59	-0.72	2.14
	(1.06)	(1.06)	(0.94)	(8.24)
Age leader	0.01	0.01	0.02	-0.17
	(0.02)	(0.02)	(0.02)	(0.12)
Right party	-0.13	-0.16	-0.23	1.34
	(0.39)	(0.39)	(0.35)	(3.01)
Center party	-1.37**	-1.35**	-1.28***	-1.14
	(0.54)	(0.54)	(0.48)	(4.22)
Parliamentary syst	0.32	0.20	-0.11	5.37
	(0.42)	(0.43)	(0.42)	(3.26)
Democracy	-0.05	-0.01	0.08	-1.57***
	(0.06)	(0.07)	(0.07)	(0.49)
Democracy age	0.00	-0.00	-0.01	0.15***
	(0.01)	(0.01)	(0.01)	(0.05)
British colony	-0.83*	-0.76*	-0.58	-3.13
	(0.42)	(0.42)	(0.37)	(3.26)
French colony	-0.78	-0.63	-0.24	-6.78
	(0.57)	(0.58)	(0.49)	(4.41)
GDP per capita	0.47	0.44	0.34	1.64
	(0.33)	(0.33)	(0.30)	(2.53)
Openness	-0.00	-0.00	-0.00	0.00

	(0.00)	(0.00)	(0.00)	(0.04)
Oil	-1.68***	-1.52***	-1.09**	-7.51*
	(0.49)	(0.51)	(0.47)	(3.85)
Population	-0.21	-0.20	-0.17	-0.55
	(0.14)	(0.14)	(0.12)	(1.09)
Urban sh	0.02	0.02	0.01	0.07
	(0.01)	(0.01)	(0.01)	(0.11)
Migrant sh	0.06**	0.07**	0.08***	-0.26
	(0.03)	(0.03)	(0.02)	(0.21)
Protestant sh	0.00	-0.01	-0.03	0.33***
	(0.01)	(0.01)	(0.02)	(0.09)
Catholic sh	0.01	0.01	0.01	0.05
	(0.01)	(0.01)	(0.01)	(0.05)
Muslim sh	-0.00	-0.00	-0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.05)
Hindu sh	-0.02	-0.02	-0.02	-0.04
	(0.02)	(0.02)	(0.01)	(0.13)
Constant	2.88	2.47	1.34	19.46
	(3.57)	(3.57)	(3.25)	(27.77)
Region effects	Yes	Yes	Yes	Yes
No of obs	80	80	80	80
R-sq	0.76	0.77	0.72	0.64

*denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

Table 6 2SLS regressions of public health spending with additional controls

		1st stage		1st stage		1st stage
Sh women in cab	0.08*		0.07**		0.07**	
	(0.04)		(0.03)		(0.03)	
Sh women in parl^			0.04**	0.13		
			(0.02)	(0.17)		
Sh daughters		0.10***		0.11***		0.10**
		(0.04)		(0.04)		(0.04)
State religion^						-4.92*
						(2.88)
Num child	0.03	-0.97	0.11	-1.31**	0.02	-0.98*
	(0.08)	(0.60)	(0.07)	(0.62)	(0.07)	(0.58)
Male leader	-0.76	1.55	-0.72	3.64	-0.69	-0.38
	(0.94)	(8.39)	(0.83)	(8.17)	(0.92)	(8.23)
Age leader	0.02	-0.18	0.01	-0.15	0.02	-0.16
	(0.02)	(0.13)	(0.01)	(0.13)	(0.02)	(0.12)
Right party	-0.24	1.15	-0.18	1.09	-0.22	2.14
	(0.34)	(3.07)	(0.30)	(2.97)	(0.34)	(3.00)
Center party	-1.30***	-1.36	-1.10***	-1.38	-1.28***	-0.50
	(0.47)	(4.26)	(0.41)	(4.18)	(0.47)	(4.16)
Nationalist party^	0.00	0.01				
	(0.00)	(0.01)				
Regional party^	-0.36	-4.08				
	(0.69)	(5.96)				
Parliamentary syst	-0.07	5.52	0.01	5.01	-0.07	5.87*
	(0.43)	(3.34)	(0.35)	(3.22)	(0.40)	(3.22)
Democracy	0.07	-1.56***	0.06	-1.42***	0.07	-1.63***
	(0.07)	(0.50)	(0.06)	(0.50)	(0.07)	(0.49)
Democracy age	-0.01	0.15***	-0.01	0.15***	-0.01	0.17***
	(0.01)	(0.05)	(0.01)	(0.05)	(0.01)	(0.05)
British colony	-0.66	-3.88	-0.60*	-1.33	-0.59	-3.92

	(0.41)	(3.53)	(0.34)	(3.42)	(0.37)	(3.24)
French colony	-0.30	-7.21	-0.33	-5.77	-0.26	-7.04
	(0.50)	(4.51)	(0.42)	(4.39)	(0.47)	(4.33)
GDP per capita	0.34	1.56	0.43*	1.01	0.36	1.01
	(0.29)	(2.56)	(0.25)	(2.52)	(0.29)	(2.51)
Openness	-0.00	0.00	-0.01	0.02	-0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.04)	(0.00)	(0.04)
Oil	-1.12**	-7.62*	-0.98**	-8.85**	-1.12**	-7.77**
	(0.47)	(3.88)	(0.42)	(3.86)	(0.45)	(3.78)
Population	-0.18	-0.64	-0.24**	0.05	-0.17	-0.65
	(0.13)	(1.12)	(0.11)	(1.12)	(0.12)	(1.07)
Urban sh	0.01	0.07	0.01	0.05	0.01	0.05
	(0.01)	(0.11)	(0.01)	(0.11)	(0.01)	(0.11)
Migrant sh	0.08***	-0.24	0.07***	-0.26	0.08***	-0.26
	(0.02)	(0.22)	(0.02)	(0.21)	(0.02)	(0.21)
Protestant sh	-0.02	0.33***	-0.03**	0.32***	-0.02	0.33***
	(0.02)	(0.09)	(0.01)	(0.09)	(0.02)	(0.09)
Catholic sh	0.01	0.05	0.01	0.05	0.01	0.05
	(0.01)	(0.05)	(0.01)	(0.05)	(0.01)	(0.05)
Muslim sh	-0.01	0.01	-0.00	0.01	-0.00	0.02
	(0.01)	(0.05)	(0.01)	(0.05)	(0.01)	(0.05)
Hindu sh	-0.02	-0.04	-0.02	-0.05	-0.02	-0.01
	(0.01)	(0.13)	(0.01)	(0.12)	(0.01)	(0.12)
Constant	1.71	23.67	1.97	10.10	1.49	34.56
	(3.36)	(28.66)	(2.80)	(27.91)	(3.17)	(28.67)
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
No of obs	80	80	79	79	80	80
R-sq	0.73	0.65	0.79	0.66	0.73	0.66
F test of excluded instruments						5.86
Overidentification test (p from χ-sq test)						0.72

*denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

Table 7 Table 6 2SLS regressions with different dependent variables

	(1)	(2)	(3)
Sh women in cab	0.05	0.21*	-0.02**
	(0.28)	(0.11)	(0.01)
Num child	-0.80	0.14	-0.03*
	(0.55)	(0.23)	(0.02)
Male leader	-11.15*	2.88	-0.06
	(6.71)	(2.75)	(0.23)
Age leader	0.14	-0.02	-0.01***
	(0.12)	(0.05)	(0.00)
Right party	0.21	-0.91	-0.06
	(2.46)	(1.01)	(0.08)
Center party	-3.60	-2.49*	-0.03
	(3.39)	(1.39)	(0.12)
Parliamentary syst	-1.54	-3.29***	-0.18*
	(2.98)	(1.22)	(0.10)
Democracy	-0.81	0.60***	-0.03*
	(0.51)	(0.21)	(0.02)
Democracy age	0.01	-0.04*	0.00
	(0.06)	(0.02)	(0.00)
British colony	-10.23***	3.65***	-0.18**
	(2.66)	(1.09)	(0.09)
French colony	-12.14***	3.49**	-0.08
	(3.46)	(1.42)	(0.12)
GDP per capita	-4.36**	2.24***	0.01
	(2.10)	(0.86)	(0.07)
Openness	0.05*	-0.01	0.00***
	(0.03)	(0.01)	(0.00)
Oil	-1.17	1.13	-0.20*
	(3.31)	(1.36)	(0.11)
Population	-0.35	0.80**	0.01

	(0.88)	(0.36)	(0.03)
Urban sh	-0.01	0.01	0.00
	(0.09)	(0.04)	(0.00)
Migrant sh	0.40**	0.11	-0.00
	(0.18)	(0.07)	(0.01)
Protestant sh	0.07	-0.07	0.01
	(0.12)	(0.05)	(0.00)
Catholic sh	0.00	-0.03*	-0.00
	(0.04)	(0.02)	(0.00)
Muslim sh	-0.03	-0.02	0.00
	(0.04)	(0.02)	(0.00)
Hindu sh	-0.02	0.01	0.01**
	(0.10)	(0.04)	(0.00)
Constant	74.71***	-23.23**	1.25
	(23.15)	(9.49)	(0.79)
Region effects	Yes	Yes	Yes
No of obs	80	80	80
R-sq	0.51	0.89	0.32

(1) dependent variable is government size; (2) dependent variable is health expenditure per capita; (3) dependent variable is growth rate of gender gap in life expectancies; *denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

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