Gender in the time of COVID-19: Evaluating national leadership and COVID-19 fatalities

Leah C. Windsor
Research Assistant Professor, Institute for Intelligent Systems
Faculty Affiliate, Department of Political Science
The University of Memphis

Gina Yannitell Reinhardt
Reader, Department of Government
University of Essex

Alistair J. Windsor
Associate Professor, Department of Mathematical Sciences
Director, Institute for Intelligent Systems
The University of Memphis

Courtney Burns
Assistant Professor, Department of Political Science
Bucknell University

Jarod Giger
Associate Professor, College of Social Work
University of Kentucky

Robert Ostergard
Associate Professor, Department of Political Science
University of Nevada, Reno

Susan Allen
Associate Professor, Department of Political Science
The University of Mississippi

Reed Wood
Reader, Department of Government
University of Essex

Abstract

In this paper we explore whether countries led by women have fared better during the COVID-19 pandemic than those led by men. Media and public health officials have lauded the gender-related influence on policies and strategies for reducing the deleterious effects of the pandemic. We examine this proposition by analyzing COVID-related deaths globally across countries led by men and women. While we find some limited support for lower reported fatality rates in countries led by women, they are not statistically significant. More women represented in the legislature is

associated with more reported fatalities. We offer several potential explanations for the pervasive perception that countries led by women have fared better during the pandemic, including data selection bias and Western media bias that amplified the successes of women leaders in OECD countries.

Key terms: COVID-19; gender; leadership; policy; bias

Introduction

In recent months, many have suggested that countries led by women have fared better during the Covid-19 pandemic than those led by men. This popular narrative has appeared in the *New York Times, Forbes, Vox, the Harvard Business Review, Stanford Medicine,* and *NBC News* (Anderson, 2020; Chamorro-Premuzic & Wittenberg-Cox, 2020; NBC, 2020; Taub, 2020; White, 2020). It suggests that women world leaders have excelled during the pandemic because they could demonstrate both masculine and feminine leadership traits, because they are good listeners and seek input and counsel, because they provide a big-picture overview of the situation and because they manage risk differently from their male counterparts (Anderson, 2020).

Worldwide, countries have varied in their pandemic policy responses and leadership styles, from early border closures (Vietnam) to comprehensive, randomized testing (Iceland), to decentralized responses that vary by states and localities (United States). The array of approaches, against the backdrop of the exemplary women leaders narrative, provides an ideal opportunity to investigate the question: How do gendered leadership traits characterize our expectations and perceptions of success against the realities of pandemic outcomes? Contrary to other analyses that suggest countries led by women have six times fewer deaths than those led by men (Coscieme et al., 2020), our analysis shows no statistically significant differences between Covid-19 fatality rates in countries run by women versus men. However, we identify qualitative, descriptive differences that do distinguish pandemic outcomes in countries led by women.

We consider the palliative effects of women chief executives and gender parity in the legislature, both of which may help mitigate against the risks posed by a global pandemic. Our results are surprising: first, the effect of having women leaders in office on the reported number of Covid-19-related deaths is not significant; and second, counterintuitively, increased women's representation has a positive and significant effect on reported Covid-19-related deaths – meaning that countries with more women legislators have a higher number of deaths. These results complement recent findings on the effects of state capacity, political responsiveness, political priorities, and social structures (Bosancianu et al., 2020). Bosancianu et al., find no significant differences between men-led and women-led countries in Covid-19 fatalities. Importantly, they also find that previous pandemic exposure has negligible benefit, that liberal democracies have higher fatality rates, and that women world leaders have higher – but not statistically significant– fatality rates than men world leaders.

We consider our null findings in the context of several factors. First, current analyses that suggest women-led countries are faring better may suffer from selection bias. We challenge the prevailing narratives by examining a global sample of leaders, rather than a limited OECD-only analysis. For example, New Zealand's Prime Minister Jacinda Ardern's success in "flattening the curve" attracted initial attention and speculation about the role of leader gender in mitigating the deleterious effects of the pandemic. Iceland has garnered similar praise. By analyzing only this economically advanced subset of cases, other researchers and news outlets amplify a message that does not resonate with the reality of global data. While it is the case that some women-led countries are experiencing better social outcomes than some men-led countries, we show that the trend is far from universally true.

Second, Iceland and New Zealand differ in substantive and important ways from many other countries. They are remote, largely inaccessible and mostly rural island countries with a strong history of providing public goods. Analyses focusing only on the 37 OECD countries cannot account for such factors. By focusing on a larger sample of countries, we are able to analyze these types of contextual factors alongside gender.

Third, public attention has focused on female chief executives, rather than women's representation more broadly. Based on gender-based theoretical frameworks, we suggest that leader gender does matter, but not in the ways highlighted by the current discussion. Rather, we note that women-led countries are positioned to excel in many ways beyond the pandemic because of their gendered policymaking constraints, and incentives. As yet, important related questions regarding how women-led countries might fare better in the long term have not been asked and studied.

Below we explore the theoretical foundations for public perception for why women-led countries have outpaced their male counterparts in the pandemic policy arena. We test our expectations using data from several sources, providing robustness checks with several methodological approaches. We conclude with a discussion of the big-picture implications of our findings in the context of the current pandemic and beyond.

Gendered Perceptions of Pandemic Success

Leadership styles of women chief executives

Female leaders are positioned to thrive in their capacity as leaders during a pandemic because of the dual expectations of leadership they face. Past research shows that women leaders face a political double bind (C. Burns & Kattelman, 2017; C. Burns & Murdie, 2018). They must be both masculine (i.e., act like a leader) and feminine (i.e., act like a woman). In other words, women leaders are beholden to gender stereotypes and scrutiny that men in power escape. If women leaders violate stereotypes, their constituents are more likely to punish them than when men do the same (Heilman & Okimoto, 2007; Ridgeway, 2001).

The double bind reinforces the prevailing narrative that women leaders are handling the Covid-19 pandemic better. Many women in government tend to focus on health, human security, education, and capacity-building (T. Barnes, 2012) and women are expected to fulfill feminine gendered norms of behavior such as being caring and nurturing. Men, meanwhile, tend to prefer intervention-based policies (Post & Sen, 2020), and are expected to behave in traditionally masculine ways, such as displaying strength and decisiveness with respect to crime or defense (Diekman, 2007). Pandemics offer women leaders an opportunity to be assertive about health and human security, and thereby to demonstrate both feminine and masculine leadership traits in a combination that should translate to fewer deaths.

The media narrative has lauded women's pandemic leadership performance on three fronts: their strict and clear pandemic policies; their capacity to swiftly flatten the curve (Kristof, 2020; North, 2020; Taub, 2020); and their compassionate, relatable communication styles. As Windsor et al. (2020) theorize, the significant policy speeches given by women world leaders in mid-March 2020 – specifically Jacinda Ardern of New Zealand and Angela Merkel of Germany – shortly after the World Health Organization declared Covid-19 a pandemic, shaped global perception that women chief executives were controlling the spread of the virus better than men (Windsor et al., 2020).

These leaders have utilized familiar, prosocial, feminine frames in their speeches that align with the political double bind, resonating with their own citizens and throughout the world (Johnson & Williams, undefined/ed). Such frames include increased references to social and community themes and fewer references to work and achievements. As Windsor et al., note, women leaders have also given more cohesive and narrative speeches than have male leaders (Windsor et al., 2020). Their leadership successes have contributed to a blanket generalization that all women-led countries have thrived during the pandemic.

Challenging the Current Narrative

We challenge the prevailing narrative on multiple grounds. The first is selection bias. Figure 1 shows how the Economist Intelligence Unit recently ranked OECD countries by the quality of their Covid-19 responses (The Economist, 2020). While it is true that women-led countries are over-represented among those with the highest scores, this figure does not capture the full picture of women-led countries in the world, but rather reinforces Western biases and perception of gender and leadership responses to the pandemic, ignoring the responses of non-OECD women-led countries. As Geddes wrote about selection bias, the cases you choose affect the outcomes you get (Geddes, 1990).

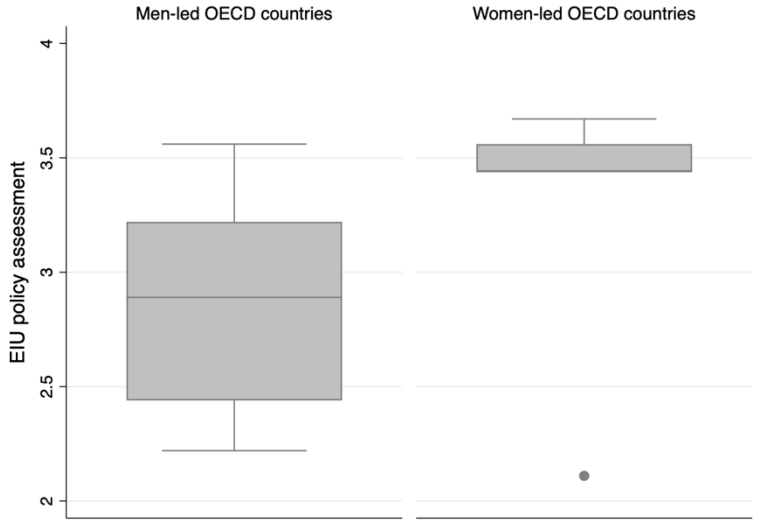

Figure 1. Economist Intelligence Unit assessment of OECD countries

This selection bias hinders our ability to consider important contextual variables. We can see the effect of this exclusion qualitatively if we expand to consider countries outside the OECD. For example, in the case of New Zealand, Ardern's swift policy action and relatable public outreach helped to limit the spread of the virus, as did New Zealand's remote location that facilitated a comprehensive border closure (Johnson & Williams, undefined/ed; Windsor et al., 2020). Yet other countries that have limited the damage from this pandemic have received comparatively less attention. Vietnam, a man-led non-OECD non-democratic country, has no reported Covid-19 deaths, and only 300 cases in a country of 97 million that shares a land border with China (Jones, 2020).

This comparison highlights another source of bias when focusing only on OECD countries, which is the inability to consider pandemic management in authoritarian regimes. While democracies and highly developed countries tend to over-provide public goods, dictatorships may have an "authoritarian advantage" in implementing comprehensive pandemic policies that limit the social, political, medical, and economic impacts of the virus. Combined with lower levels of economic development, the authoritarian advantage becomes particularly beneficial pandemic-wise in agrarian societies where people already live farther apart than they would in an urban/industrial context. (Kavanagh, 2020; Schwartz, 2012).

Gendered Leadership and Disaster Outcomes

Extant scholarship on leadership and gender suggests that countries led by women should have better social outcomes during the Covid-19 pandemic because they are better at anticipatory

policymaking that increases social buffers (Eagly et al., 2003). Women leaders also engender more trust in government and decrease perceptions of corruption (T. D. Barnes & Beaulieu, 2014, 2019). These two factors make disasters like pandemics easier to manage because citizens are more willing to follow the advice of leaders they trust (Reinhardt, 2015).

It is important to note that disaster outcomes are not merely dependent on leadership now, but also on preparation that took place previously. In fact, strong disaster preparation systems would have protocols in place for confronting threats such as a pandemic that today's leaders need only activate, adapt, and implement. Figure 2 shows standardized average disaster preparedness scores according to leader gender (*Hyogo Framework for Action*, 2020). Women-led countries have higher average preparedness ratings. The trends in these figures may be due in part to female leaders' incentives to focus on more traditionally feminine, prevention-oriented policies while in office, such as health, welfare, and education, that would benefit the public good.

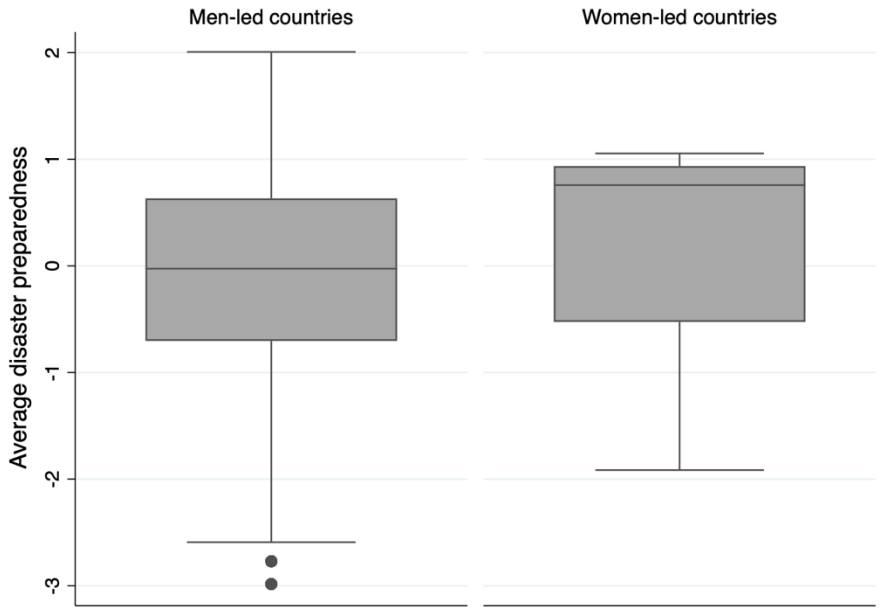

Figure 2. Disaster preparedness in men- and women-led countries

Women in Parliament

A fundamental consideration of this examination of women leaders is the rarity of *women chief executives*, which we define as women who have military control. Our sample for Figure 2 is 92% men and 8% women. Yet many more women are represented in national legislatures than in their country's highest office. To expand our abilities to draw inferences based on our analyses below, we open the discussion to the potential of women in national legislatures to affect pandemic outcomes.

In studies of legislatures, the different leadership priorities between women and men in government point toward distinct policy preferences and leadership characteristics. Women's priorities are communal and grounded in preventive measures, while men's tend to be agentic and reactive (Rosette & Tost, 2010) (Abele, 2003). Women's leadership is seen as transformational (i.e., capacity-building and focused on improving the status-quo), and men's as transactional (i.e., providing rewards for individual behavior, and waiting for problems to

innovate solutions) (J. M. Burns, 1978; Eagly et al., 2003). Yet female leaders are expected to be more communal on some issues and more agentic on others (C. Burns & Murdie, 2018; Ridgeway, 2001), making the complexities of a global pandemic ideal for highlighting women's leadership and policymaking assets.

Additionally, we consider the possibility that women chief executives' effectiveness may be amplified by more women's representation in the legislature. Women-led countries have on average more women in parliament than do men-led countries, even controlling for the type of governance (Jalalzai & Krook, 2010). As shown in Figure 3, women-led countries generally have more women in the legislature, with the exception of countries designated as "Not Free" (Freedom House, 2020). More women in legislatures transforms parties and diversifies political agendas (T. D. Barnes & Holman, 2020).

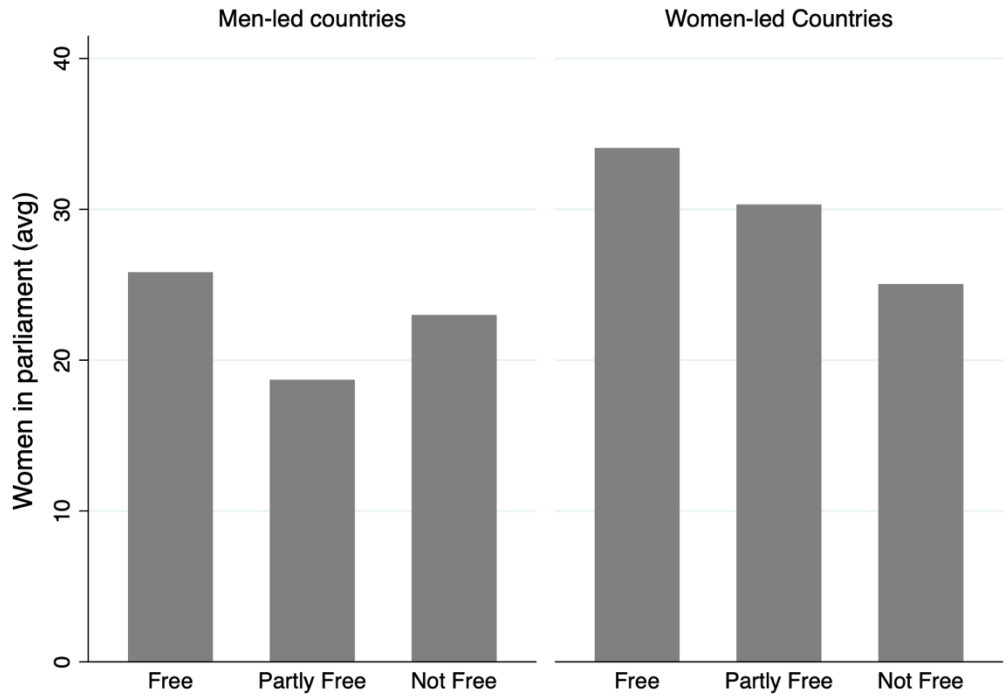

Figure 3. Average number of women in parliament for men-led and women-led countries, by Freedom House status

The policies on which women focus are seen as key to generating resilience (Kutzin & Sparkes, 2016), including resilience to unplanned shocks such as pandemics. Social benefits should deepen with greater gender parity in the legislature (Swers, 2001), and in democracies given their incentive to provide public goods (Deacon, 2009). Gender parity in the legislature also elevates "women's issues" (T. D. Barnes & Burchard, 2013; Schwindt-Bayer & Mishler, 2005; Taylor-Robinson & Heath, 2003). Countries with more women in parliament have better parental leave policies, spend more on public health, and are involved in less conflict internationally (Clayton & Zetterberg, 2018; Kittilson, 2008; Regan & Paskeviciute, 2003; Schwindt-Bayer, 2006; Schwindt-Bayer & Mishler, 2005).

From a theoretical perspective, people in countries with women chief executives and greater women's representation in the legislature may have better social and physical outcomes –

fewer deaths – during a pandemic both because of the emphasis on baseline preparation as a function of their caregiver role expectations, and also because they can demonstrate masculine leadership by acting decisively to close borders and implement other emergency executive measures unilaterally. In other words, women can both react compassionately by asking their constituents to behave for the common good, and aggressively by closing down borders. These actions fulfill both gendered traits, and work in the favor of women leaders.

Cross-nationally, countries with more women in parliament do pass categorically different policies than men. Yet some research problematizes the relationship between women representatives and these policies (T. D. Barnes & Holman, 2020). Women's representation is highly related to gender quotas (Baldez, 2006; T. Barnes, 2012; Krook, 2007), which many countries, especially in the developing world, have adopted after ratifying CEDAW (Liebowitz & Zwingel, 2014). Often this ratification takes place because it helps with international legitimacy, which creates a complicated relationship between policy and representation. More women in parliament can offer more diverse legislation, but the variation in routes to achieving greater women's representation may not offer protection against problems like global pandemics.

Feminine social cultural norms

Another avenue of interest is the intersection of a country's culture (Inglehart et al., 2005), with its likelihood of electing women leaders. No research has explicitly found why some countries elect women and others do not. However, we do have insights into potential determinants of Covid-19 survival. Erman and Medeiros examine cultural dimensions that could influence responses to the pandemic, including individualism vs. collectivism, uncertainty avoidance, indulgence vs. restraint, long-term vs. short-term normative orientation, masculinity vs. femininity, and power distance index (Erman & Medeiros, 2020; Hofstede, 2011). They find that more individualistic cultures, and those that trend toward uncertainty avoidance and long-term orientation were associated with higher fatalities, both in terms of case fatality and mortality rates.

We posit that these cultural factors could play a role in a country's election of women, as well. The cultural factor most relevant to our inquiry is masculine versus feminine (Geertz, 1973). In more feminine societies, women should be rewarded for preventive and interventive policies that should do three things: elevate their country's baseline resilience from pandemics; limit the immediate pandemic-related damage; and mitigate against long-term negative consequences. Countries that elevate feminine traits prioritize having minimal role differentiation between genders, encourage sympathy for the weak, and elect women to multiple political positions (Hofstede, 2011; Inglehart et al., 2005). Countries that prioritize feminine cultural norms should also have less to reconcile with regards to the political double bind (Hofstede, 1998). To that end, if a woman currently leads a country that props up feminine cultural norms, then by definition there is society-wide support for policies that would benefit the public good. In turn, the woman leader should have more flexibility in the policies she can enact, which becomes especially relevant in managing a pandemic.

In Figure 4 we see that people in countries led by women place lower value on power distance, masculine traits, and uncertainty avoidance, and higher value on individualism, long-term goal orientation, and indulgence. On the other hand, countries led by men have greater power distance, more masculine traits, and more discomfort with uncertainty. They also have less individualism, less long-term goal orientation, and less indulgence.

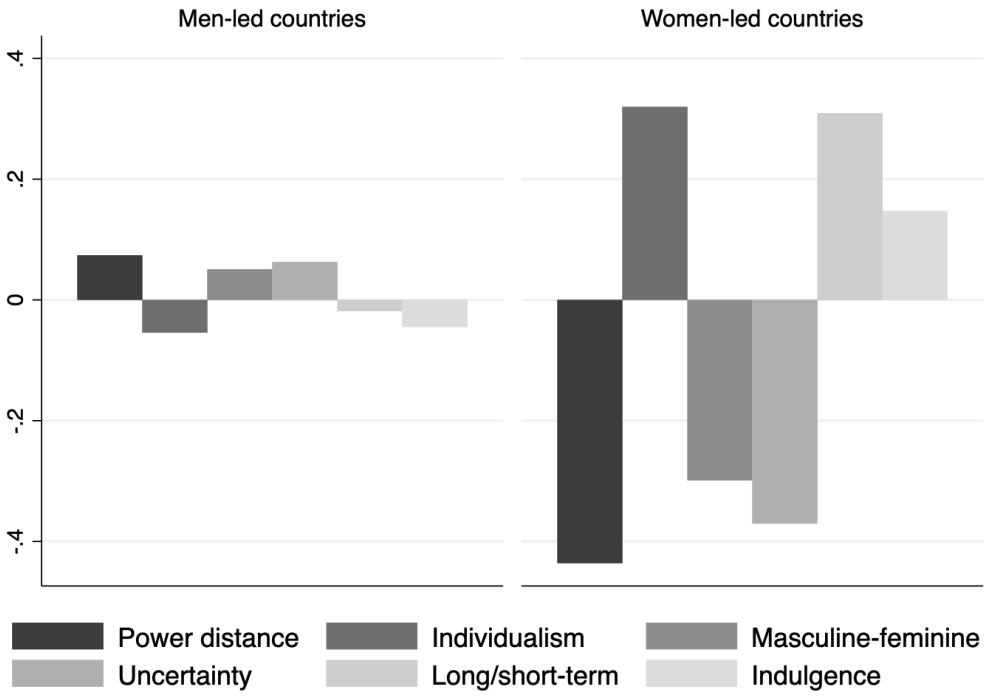

Figure 4. Differences in cultural dimensions between countries led by men and women

We also note that culture can overlap with government type. From the theoretical standpoint of the political double bind, having a woman chief executive and having more women represented in parliament should provide more opportunities and incentives for policymaking that would increase the provision of public goods. During a national or global crisis, having more women in office, both as chief executive and in parliament, should increase social resiliency and reduce physical harm in society (Bosancianu et al., 2020). As we see in Figure 4, Free and Partly Free women-led countries have more women represented in the legislature (Freedom House, 2020; Paldam, 2007). Having a woman chief executive, more women in the legislature, and living in a democratic country should then offer the most protections against the ills of a global pandemic.

From this discussion we generate three hypotheses:
H1: Countries led by women will have fewer Covid-19-related deaths.
H2: Countries with greater numbers of women in government will have fewer Covid-19-related deaths.
H3: Countries with stronger feminine culture (or weaker masculine culture) will have fewer Covid-19-related fatalities.

Data

Data for this analysis comes from Our World in Data (Ritchie, 2020), the World Bank (World Bank, 2020), Freedom House (Freedom House, 2020), and the World Health Organization (WHO, 2020). We include female leaders in our sample (n=16) if they hold executive authority (in that they command a military), regardless of whether they are head of state or head of

government. The italicized names are the women chief executives we include in our model, shown in Table 1. Summary statistics for variables are provided in the Appendix.

Table 1. Women leaders included in analysis

	Country	Head of State	Head of Government	Gender quota
1	Aruba	Alfonso Boekhoudt	*Evelyn Wever-Croes*	No
2	Bangladesh	Abdul Hamid	*Sheikh Hasina*	Yes
3	Barbados	Elizabeth II	*Mia Mottley*	No
4	Belgium	Philippe	*Sophie Wilmès*	Yes
5	Bolivia	*Jeanine Áñez*		Yes
6	Denmark	Margrethe II	*Mette Frederiksen*	No
7	Finland	Sauli Niinistö	*Sanna Marin*	No
8	Germany	Frank-Walter Steinmeier	*Angela Merkel*	No
9	Hong Kong		*Carrie Lam*	No
10	Iceland	Guni Th. Jóhannesson	*Katrín Jakobsdóttir*	No
11	Myanmar	Win Myint	*Aung San Suu Kyi*	No
12	New Zealand	Elizabeth II	*Jacinda Ardern*	No
13	Norway	Harald V	*Erna Solberg*	No
14	Serbia	Aleksandar Vučić	*Ana Brnabić*	Yes
15	Taiwan		*Tsai Ing-wen*	Yes
16	Turks and Caicos		*Sharlene Cartwright-Robinson*	Yes

We account for the phased onset of the epidemic across different countries when operationalizing the notion of deaths. We generate six different measures of deaths by using two different baselines and three different time horizons. Our two baselines variables are date of first reported Covid-19 case per country, and date of first reported Covid-19 fatality per country. We consider these baselines in case the date of the first reported Covid-19 case is more sensitive to the quality and extent of the countries' testing regime than the date of the first confirmed Covid-19 fatality. We consider reported Covid-19 deaths at 30, 60, and 90 days after the baseline. Countries without reported Covid-19 deaths are included in the analysis of days since first reported case, but excluded from analysis of days since first reported death, because they have no deaths from which to begin the analysis.

Methods

Model 1 is a t-test of the reported Covid-19 deaths per capita by sex of the leader, and a t-test of the reported Covid-19 deaths per capita by world cultures. Model 2 is a Generalized Linear Model using the binomial family and the logit link function with robust standard errors. The dependent variable is reported deaths per capita. The two main explanatory variables are a binary measure of whether the chief executive is a woman, and the proportion of women represented in the country's national legislature. We also control for governance (Freedom House, 2020), percent of the population over age 65, GDP per capita, the size of the country (land area), life expectancy, and the size of land borders. Model 3 uses nearest neighbor matching to estimate the

average treatment effects and average treatment effects on the treated to determine differences in fatalities between male-led and female-led countries (Abadie et al., 2004; Abadie & Imbens, 2011).

Results

Basic differences: t-tests

As Table 2 shows, we find no statistically significant differences between countries led by men versus women for either reported Covid-19 fatalities, or for Hofstede's cultural dimensions. While there are no significant differences for culture, we do observe patterns that indicate countries led by women have different cultural practices than those led by men that align with those found by Erman and Medeiros (Erman & Medeiros, 2020). While their study has an N=49, this sample is twice that (N=100).

Table 2. t-test results for number of reported deaths from first case and first death at 30, 60, and 90 days, and for Hofstede cultural dimensions

	Variables	**Coeff.**	**t**
Covid-19 related deaths	Cases 30 days	0.000005	-0.48
	Cases 60 days	0.000007	-0.28
	Cases 90 days	-0.000004	-0.12
	Deaths 30 days	-0.000005	-0.28
	Deaths 60 days	-0.000008	-0.24
	Deaths 90 days	0.000005	-0.11
	N=167	167	
Hofstede cultural dimensions	Power distance	11.15	-1.50
	Individualism	-8.98	.-1.09
	Masculine vs. feminine	6.93	-1.02
	Uncertainty	10.27	-1.27
	Long-term	-7.89	.-1.04
	Indulgence	-4.29	.-0.61
	N=100		

Generalized Linear Model

Table 3 shows the results for the Generalized Linear Model for reported deaths following the first Covid-19 case (Model 2). Here, female-led countries do not have significantly lower reported numbers of deaths three months after the first reported case. Although non-significant, the coefficient sign for reported deaths at one, two, and three months is negative. These findings suggest modest, albeit statistically insignificant, support for Hypothesis 1. In this model we introduce the variable of the number of women in parliament. At one month from the first reported case, having more women in parliament has a negative and non-significant effect on deaths. At two months, the sign changes to positive, but still not significant. At three months,

more women in parliament has a positive and statistically significant effect on the number of reported deaths. We explore these findings in the discussion section.

Overall, contrary to Hypothesis 2, having more women in parliament is associated with *higher* numbers of reported deaths. Additionally, democracies ("Free" in the Gastil Index ratings) and countries with large GDP per capita incomes have more reported cases, and more reported deaths (Freedom House, 2020). Having an older population, and a higher GDP per capita, are both associated with increased reported deaths.

Table 5 reports the results of reported fatalities at 30, 60, and 90 days after each country's first reported death. The same patterns emerge for women leaders: the coefficient signs are negative, and statistically not significant. However, for women in parliament, the coefficients are all positive and all statistically significant. The results from Tables 4 and 5 are summarized in Table 6. We have plotted the marginal effects for women and men leaders in Figure 3, and marginal effects for the number of women in parliament in Figure 4.

Table 3. Generalized Linear Model for number of reported deaths from the first reported cases at 30, 60, and 90 days

	Case 30 days		**Case 60 days**		**Case 90 days**	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Woman chief executive	-0.069	0.580	-0.423	0.460	-0.325	0.577
Women in parliament	-0.024	0.016	0.016	0.013	.038***	0.010
Free	1.412**	0.447	0.585	0.402	0.152	0.367
Not Free	0.148	0.514	-0.177	0.518	-0.629	0.457
GDP per capita	0.000	0.000	.000**	0.000	0.000	0.000
Percent over 65 years	-0.044	0.034	0.020	0.032	0.024	0.031
Land area	0.000	0.000	-.000**	0.000	0.000	0.000
Land borders	-0.011	0.080	0.040	0.062	0.075	0.049
Life expectancy	0.066	0.039	.100**	0.036	.133***	0.039
Constant	-17.91***	2.658	-20.22***	2.523	-22.38***	2.670
N. of cases	165		166		162	
*** p<0.05, ** p<0.01, *** p<0.001**						

Table 4. Generalized Linear Model for number of reported deaths from the first reported deaths at 30, 60, and 90 days

	Death 30 days		**Death 60 days**		**Death 90 days**	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Woman chief executive	0.043	0.569	-0.305	0.588	-0.305	0.588
Women in parliament	.031**	0.012	.043***	0.010	.043***	0.010
Free	.817*	0.361	0.378	0.346	0.378	0.346
Not Free	-0.111	0.341	-0.336	0.392	-0.336	0.392
GDP per capita	.000*	0.000	.000*	0.000	.000*	0.000
Percent over 65 years	0.034	0.028	0.044	0.028	0.044	0.028

Land area	-.000**	0.000	0.000	0.000	0.000	0.000
Land borders	-0.007	0.050	0.025	0.047	0.025	0.047
Life expectancy	0.055	0.040	.077*	0.038	.077*	0.038
Constant	-17.63***	3.002	-18.64***	2.699	-18.64***	2.699
N. of cases	152		147		147	
*** p<0.05, ** p<0.01, *** p<0.001**						

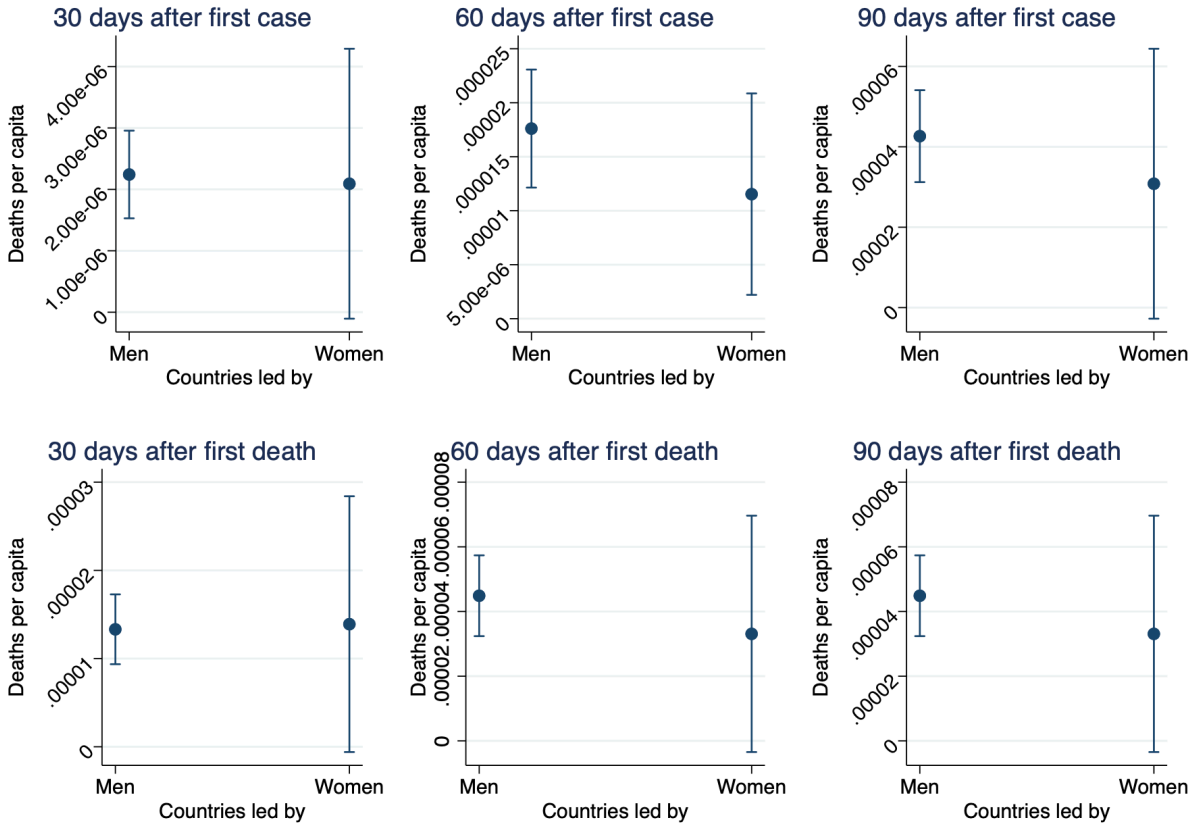

Figure 5. Deaths per population, men- and women-led countries

Because there are so few women leaders in the sample, the confidence intervals in Figure 5 are much wider for women-led countries than for men-led countries. We note that the confidence intervals overlap, indicating that the coefficient for women leaders is not statistically significant. Figure 5 tells an important descriptive story about women's executive leadership, which we elaborate on in the discussion. In Figure 4, we see that having more women in parliament offers social protection from increased fatalities only in the thirty days after the country's first diagnosed Covid-19 case.

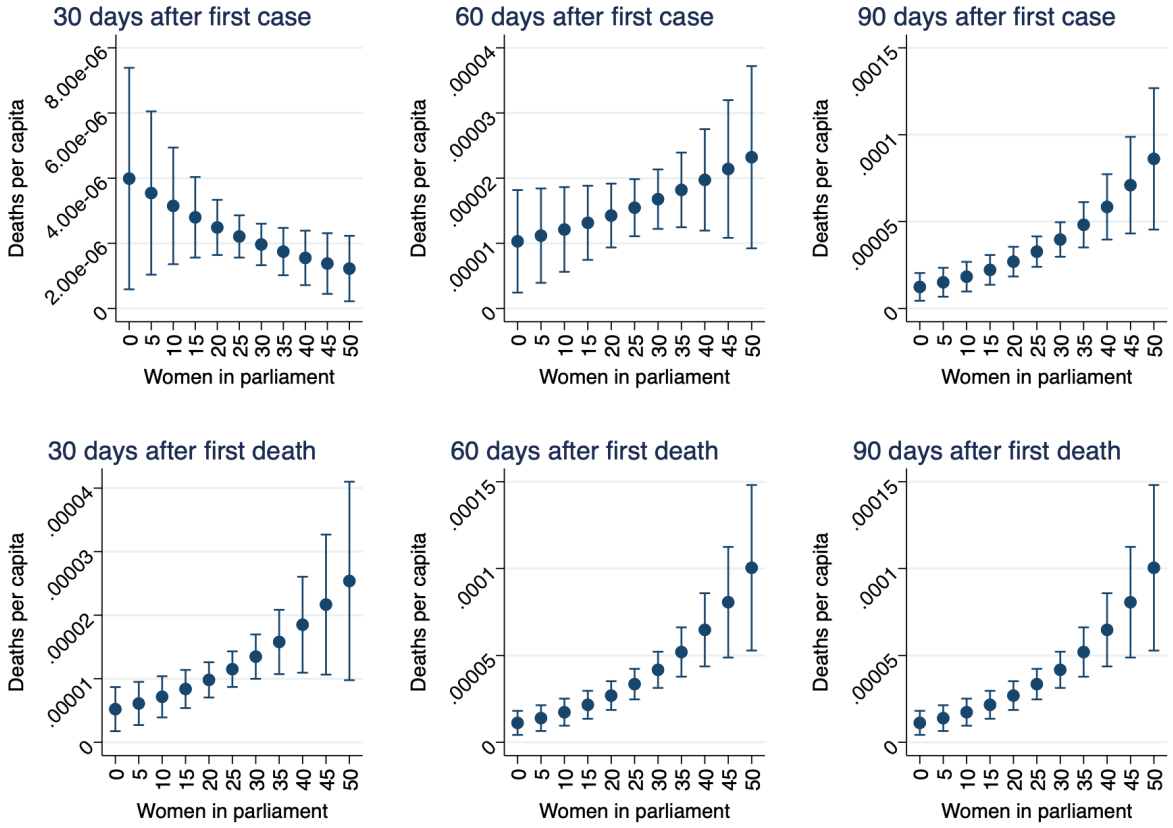

Figure 6. Deaths per population, women in parliament

Table 6 provides a summary of the direction and significance of the coefficients in the GLM regression models for 30, 60, and 90 days from first reported cases and deaths for the number of women in parliament. Having more women in parliament offers protection against more pandemic fatalities only in the first month after the first case. From the differences between the findings for women chief executives and women in parliament, it appears that these may represent distinct political processes.

Table 5. Summary of outcomes from GLM regression (see appendix for full table)

First Reported:	**Indicator:**	**30 Days from first reported:**	**60 Days from first reported:**	**90 Days from first reported:**
Cases	Female leader	Negative, NS	Negative, NS	Negative, NS
	Women in parliament	Negative, NS	Positive, NS	*Positive, S*
Deaths	Female leader	Positive, NS	Negative, NS	Negative, NS
	Women in parliament	*Positive, S*	*Positive, S*	*Positive, S*

Nearest neighbor matching

In Model 3 we use nearest neighbor matching (NNM) for the average treatment effect on the treated [ATET] (Abadie et al., 2004; Abadie & Imbens, 2011). We implement NNM for the ATET to estimate the effect of having a woman leader on the reported fatality rate per 100,000. There are no significant differences between men and women leaders at 30, 60, or 90 days post first reported case or first reported death . Additionally, some countries drop out of the sample at 90 days post first reported death because the later onset of Covid-19, so the availability of quality matches decreases substantially. The list of matched countries is included in the Appendix.

Because there are so few women countries available overall, and especially at longer time intervals to match in the sample, we explore only the average treatment effect on the treated. To address this aspect, we examine the change in reported fatality rate per 100,000 if women-led countries were instead led by men (Rubin, 1973; Terza, 1998). Table 6 shows the difference between each woman-led country and a similar male-led country, subtracting the fatality rate of the male-led country from the fatality rate of the woman-led country, and averaging over the sixteen woman-led countries. None of the differences between men and women leaders using the ATET model is statistically significant using this approach either. However, all the coefficient signs are negative, indicating that the directionality of fatalities is negative for countries led by women.

We also use inverse probability weighting since it makes use of the entire spectrum of male countries (Graham et al., 2011). We see negligible differences between the coefficients using both the nearest neighbor and inverse probability weighting approaches. Further, coefficient signs are all negative, echoing the findings in both Models 1 and 2.

Table 6. Average Treatment Effect on the Treated by Nearest Neighbor Matching and Inverse Probability Weighting

Method	Time	30 Days	60 Days	90 Days
Average Treatment Effect on the Treated by Inverse Probability Reweighting	Post First Case	-0.000001	-0.000018	-0.000043
	Post First Death	-0.000001	-0.000039	-0.000063
Average Treatment Effect on the Treated by Nearest Neighbor Matching	Post First Case	-0.000002	-0.000017	-0.000070
	Post First Death	-0.000004	-0.000079	-0.000130

Discussion

The key findings from our analysis are as follows: first, across multiple methodological approaches we find no statistically significant difference between the reported Covid-19 fatality rates in countries led by men or women. The role that women in parliament plays is somewhat surprising: more women in the legislature is associated with increased reported Covid-19 fatalities, which we will discuss further below. Free countries tend to have higher reported fatality rates in the month after the first case, but as time progresses the differences between Free, Partly Free, and Not Free become less stark. Wealthier countries, and those with older populations, have more reported fatalities. The length of land borders has no effect on reported Covid-19 fatalities, and land area matters at some points in time, but not others.

Yet countries led by women are qualitatively different from those led by men, as the double bind and cultural differences theories would predict. In Figure 5 we see that in the second

and third months of the pandemic, women-led countries have lower reported fatality rates than those led by men. While not statistically significant, they are still substantively meaningful differences. From a theoretical perspective, female leaders' should be ideally positioned to govern better than male leaders through a global pandemic crisis. Female leaders' focus on communal policies should bolster their countries' baseline preparedness, while also fulfilling the more masculine agentic frame in their ability to intervene decisively in times of crisis, such as closing borders and mandating quarantine.

The most puzzling findings relate to women's representation in national legislatures. Countries with more women in the legislature have fared worse during the pandemic, and had more reported deaths. These findings run contrary to our theoretical expectations and require additional research to disentangle. Descriptive representation at the chief executive level and in the legislature should matter to the diversity of agendas and issues that would render countries more or less vulnerable to events like global pandemics. Women representatives and leaders tend to promote women's issues that may offer more social protection.

One possible explanation is that gender quotas, which lead to higher proportions of women in the legislature, may have counterintuitive effects, especially in Partly Free or Not Free countries (Tripp & Kang, 2008). Tripp and Kang (2008) suggest that gender quotas may be symbolic, used strategically to obtain women's votes, or create new patronage networks. The adoption of gender quota legislation by countries may also be a part of a post-conflict peace settlement, or may be used by a country to strategically signal their commitment to democracy. Similar to Collier's argument about the deleterious effects of rapid democratization – elections without checks and balances (Collier, 2007) – it is likely that rapid or exogenously-influenced adoption of gender quotas may not offer deep social protections in the way that countries with endogenous growth of women in political leadership might have.

More women in parliament is correlated with increased GDP per capita, with an older population, and with democratic governance; these features do not necessarily offer more social protection from pandemics. On the contrary, they are associated with increased reported fatalities. In the long term, countries with greater women's representation may offer more protection through robust public health measures, such as increased funding for research and development related to vaccines and therapies, and increased support for using the vaccines to benefit the public good.

Women chief executives have gendered incentives related to the political double bind to attend to both masculine and feminine leadership traits. Women leaders can both care for the national family during a pandemic crisis, while also leading with decisive actions such as closing borders, issuing executive orders, and addressing security-related pandemic concerns. Based on our results, we suggest that public opinion coalesced around the idea that women-led countries were managing the pandemic better following their notable public policy speeches given in mid-March, specifically by the leaders of Germany and New Zealand.

We note several caveats that also likely impact our findings. First, countries led by men far outnumber countries led by women, biasing the sample. We corrected for this using nearest neighbor matching. Second, testing and reporting policies have changed repeatedly within countries in our sample during the reporting time: some countries suffer from well-known under-reporting biases (Atkins et al., 2015), and some countries like Belgium may be over-reporting (Schultz, 2020).

Third, women chief executives tend to govern smaller countries, both in terms of geographic and population sizes (Jalalzai, 2013). While Jacinda Ardern's leadership has

engendered massive public support domestically and abroad for Covid-19 policies related to lockdowns and quarantining, it is comparatively easier to close the borders of a remote island nation than in countries that share multiple, lengthy borders and major international transportation hubs. However, as our land borders variable was not statistically significant, this is clearly not the case everywhere.

Fourth, perceptions of women's successful leadership may also be a product of Western news bias. Researchers studying the phenomenon of pandemic in outcomes in countries led by men or women have amplified this bias by selecting a subset of cases that demonstrate the expected outcomes (Geddes, 1990). Few news outlets have covered Vietnam's successes, notably zero Covid-19 fatalities as a result of swift, comprehensive action (Jones, 2020). It could be that countries with previous epidemic or pandemic experience, like Vietnam, are in a better position to anticipate and respond to the current pandemic. Yet as Bosancianu et al., find, exposure to SARS, MERS, or Ebola does not offer more social protection (Bosancianu et al., 2020).

Finally, the fatality rate is not the only metric by which a leader or country should be judged. The overall pandemic management strategy, including policies implemented to alleviate suffering and mitigate risk, should be comprehensively evaluated to assess how well a leader or country is faring. While sex or gender may not offer immediate protections against the deadliness of Covid-19, these traits may offer important buffers against downstream problems that could emanate from the effects of the global pandemic, such as social destabilization or contentious political behavior. Women-led countries may fare better in the long run in part due to the strength of institutions, increased trust in government, and decreases in corruption that female leadership engenders.

Conclusions

This study is the first to comprehensively address the roles of women leaders and women legislators in mitigating the effect of the Covid-19 pandemic. Similar to Bosancianu et al., we find that there are no differences in reported fatalities between women-led and men-led countries. (Bosancianu et al., 2020). The theory of the political double bind helps explain why women leaders in New Zealand, Iceland, Germany, and Taiwan have garnered ubiquitous praise for their leadership, as they are excelling at deploying both masculine and feminine leadership traits during the pandemic. However, it may be that we researchers are asking the wrong questions. Women chief executives pursue different policies from their male counterparts, and women in legislatures are less corrupt and more trustworthy, at least optically for constituents (Esarey & Chirillo, 2013; Esarey & Schwindt-Bayer, 2014). Given this information, perhaps we should be asking about the long-term effects of having a woman chief executive. Will countries that have women chief executives and/or higher rates of women in parliament fare better in the long term while dealing with the aftermath of Covid-19? Will these countries have lower unemployment numbers, better re-opening plans, and less economic damage?

While some women chief executives have shown impressive governance during the Covid-19 crisis, this has not translated to significant differences in decreasing the number of cases or deaths in their countries. The number of women in parliament did not provide protections either. These results need further disentangling, and suggest that we need to rethink our metrics about what success in the pandemic means, and which exemplars we should be following. Perhaps the economic effect of a pandemic on GDP or other social measures are areas of future research. Too, perhaps the traits of our sample need further analysis. Quiet success

stories like Vietnam should be amplified, and we should also continue to investigate the extent to which Covid-19-related interventions have a gendered component. We reiterate that there are only twelve women chief executives from which to draw conclusions. Evaluating gendered policymaking requires a larger sample of women chief executives. Our results may seem puzzling, but do reflect the reality that building resilience is a preparative process, and therefore that pandemic outcomes today depend on policymaking choices made far in advance.

Works Cited

Abadie, A., Drukker, D., Herr, J. L., & Imbens, G. W. (2004). Implementing matching estimators for average treatment effects in Stata. *The Stata Journal*, *4*(3), 290–311.

Abadie, A., & Imbens, G. W. (2011). Bias-corrected matching estimators for average treatment effects. *Journal of Business & Economic Statistics*, *29*(1), 1–11.

Abele, A. E. (2003). The dynamics of masculine-agentic and feminine-communal traits: Findings from a prospective study. *Journal of Personality and Social Psychology*, *85*(4), 768.

Anderson, C. (2020, April 19). *Why Do Women Make Such Good Leaders During Covid-19?* https://www.forbes.com/sites/camianderson1/2020/04/19/why-do-women-make-such-good-leaders-during-covid-19/#5ce8392342fc

Atkins, K. E., Wenzel, N. S., Ndeffo-Mbah, M., Altice, F. L., Townsend, J. P., & Galvani, A. P. (2015). Under-reporting and case fatality estimates for emerging epidemics. *BMJ*, *350*. https://doi.org/10.1136/bmj.h1115

Baldez, L. (2006). The pros and cons of gender quota laws: What happens when you kick men out and let women in? *Politics & Gender*, *2*(1), 102.

Barnes, T. (2012). *Gender Quotas and The Representation of Women: Empowerment, Decision-making, and Public Policy* [Thesis]. https://scholarship.rice.edu/handle/1911/64632

Barnes, T. D., & Beaulieu, E. (2014). Gender Stereotypes and Corruption: How Candidates Affect Perceptions of Election Fraud. *Politics & Gender*, *10*(3), 365–391. https://doi.org/10.1017/S1743923X14000221

Barnes, T. D., & Beaulieu, E. (2019). Women Politicians, Institutions, and Perceptions of Corruption. *Comparative Political Studies*, *52*(1), 134–167. https://doi.org/10.1177/0010414018774355

Barnes, T. D., & Burchard, S. M. (2013). "Engendering" Politics: The Impact of Descriptive Representation on Women's Political Engagement in Sub-Saharan Africa. *Comparative Political Studies*, *46*(7), 767–790. https://doi.org/10.1177/0010414012463884

Barnes, T. D., & Holman, M. R. (2020). Gender Quotas, Women's Representation, and Legislative Diversity. *The Journal of Politics*, 000–000. https://doi.org/10.1086/708336

Bosancianu, C. M., Dionne, K. Y., & Hilbig, H. (2020). Political and Social Correlates of Covid-19 Mortality. *Working Paper*.

Burns, C., & Kattelman, K. (2017). Women Chief Executives: The Political Catch-22 of Counterterrorism. *Contemporary Voices: St Andrews Journal of International Relations*, *8*(2).

Burns, C., & Murdie, A. (2018). Female chief executives and state human rights practices: Self-fulfilling the political double bind. *Journal of Human Rights*, *17*(4), 470–484.

Burns, J. M. (1978). Leadership. *Harper & Row*, *280*.

Chamorro-Premuzic, T., & Wittenberg-Cox, A. (2020, June 26). Will the Pandemic Reshape Notions of Female Leadership? *Harvard Business Review*. https://hbr.org/2020/06/will-the-pandemic-reshape-notions-of-female-leadership

Clayton, A., & Zetterberg, P. (2018). Quota shocks: Electoral gender quotas and government spending priorities worldwide. *The Journal of Politics*, *80*(3), 916–932.

Collier, P. (2007). *The bottom billion: Why the poorest countries are failing and what can be done about it*. New York: Oxford Univ. Press.

Coscieme, L., Fioramonti, L., & Trebeck, K. (2020, May 26). *Women in power: Countries with female leaders suffer six times fewer Covid deaths and will recover sooner from recession*. OpenDemocracy. https://www.opendemocracy.net/en/can-europe-make-

it/women-power-countries-female-leaders-suffer-six-times-fewer-covid-deaths-and-will-recover-sooner-recession/
Deacon, R. T. (2009). Public good provision under dictatorship and democracy. *Public Choice*, *139*(1), 241–262. https://doi.org/10.1007/s11127-008-9391-x
Diekman, A. B. (2007). Negotiating the Double Bind: Interpersonal and Instrumental Evaluations of Dominance. *Sex Roles*, *56*(9), 551–561. https://doi.org/10.1007/s11199-007-9198-0
Eagly, A. H., Johannesen-Schmidt, M. C., & Van Engen, M. L. (2003). Transformational, transactional, and laissez-faire leadership styles: A meta-analysis comparing women and men. *Psychological Bulletin*, *129*(4), 569.
Erman, A., & Medeiros, M. (2020). *Exploring the impact of cultural variability on Covid-19-related mortality: A meta-analytic approach*.
Esarey, J., & Chirillo, G. (2013). Fairer sex" or purity myth? Corruption, gender, and institutional context. *Politics & Gender*, *9*(4), 361–389.
Esarey, J., & Schwindt-Bayer, L. (2014). Gender, corruption, and accountability: Why women are (sometimes) more resistant to corruption. *University of Kentucky, April*, *11*.
Freedom House. (2020). *Freedom in the World*. https://freedomhouse.org/report/freedom-world
Geddes, B. (1990). How the cases you choose affect the answers you get: Selection bias in comparative politics. *Political Analysis*, *2*, 131–150.
Geertz, C. (1973). *The interpretation of cultures* (Vol. 5019). Basic books.
Graham, B. S., Campos De Xavier Pinto, C., & Egel, D. (2011). Inverse Probability Tilting Estimation of Average Treatment Effects in Stata. *The Stata Journal*, 1–16.
Heilman, M. E., & Okimoto, T. G. (2007). Why are women penalized for success at male tasks? The implied communality deficit. *Journal of Applied Psychology*, *92*(1), 81.
Hofstede, G. (1998). *Masculinity and Femininity: The Taboo Dimension of National Cultures*. SAGE Publications.
Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, *2*(1), 2307–0919.
Hyogo Framework for Action. (2020). https://www.preventionweb.net/sendai-framework/hyogo/
Inglehart, R., Puranen, B., Pettersson, T., Nicolas, J. D., & Esmer, Y. (2005). *The World Values Survey*.
Jalalzai, F. (2013). *Shattered, cracked, or firmly intact?: Women and the executive glass ceiling worldwide*. Oxford University Press.
Jalalzai, F., & Krook, M. L. (2010). Beyond Hillary and Benazir: Women's Political Leadership Worldwide. *International Political Science Review*, *31*(1), 5–21. https://doi.org/10.1177/0192512109354470
Johnson, C., & Williams, B. (undefined/ed). Gender and Political Leadership in a Time of COVID. *Politics & Gender*, 1–12. https://doi.org/10.1017/S1743923X2000029X
Jones, A. (2020, May 15). How "overreaction" made Vietnam a virus success. *BBC News*. https://www.bbc.com/news/world-asia-52628283
Kavanagh, M. M. (2020). Authoritarianism, outbreaks, and information politics. *The Lancet Public Health*, *5*(3), e135–e136.
Kittilson, M. C. (2008). Representing women: The adoption of family leave in comparative perspective. *The Journal of Politics*, *70*(2), 323–334.

Kristof, N. (2020, June 13). Opinion | What the Pandemic Reveals About the Male Ego. *The New York Times*. https://www.nytimes.com/2020/06/13/opinion/sunday/women-leaders-coronavirus.html

Krook, M. L. (2007). Candidate gender quotas: A framework for analysis. *European Journal of Political Research*, *46*(3), 367–394.

Kutzin, J., & Sparkes, S. P. (2016). Health systems strengthening, universal health coverage, health security and resilience. *Bulletin of the World Health Organization*, *94*(1), 2. https://doi.org/10.2471/BLT.15.165050

Liebowitz, D. J., & Zwingel, S. (2014). Gender Equality Oversimplified: Using CEDAW to Counter the Measurement Obsession. *International Studies Review*, *16*(3), 362–389. https://doi.org/10.1111/misr.12139

NBC. (2020, June 9). *In the Covid-19 era, female leaders are shining—Here's why*. NBC News. https://www.nbcnews.com/know-your-value/feature/covid-19-era-female-leaders-are-shining-here-s-why-ncna1227931

North, A. (2020, May 21). *Are women leaders better at fighting coronavirus? It's complicated.* Vox. https://www.vox.com/2020/5/21/21263766/coronavirus-women-leaders-germany-new-zealand-taiwan-merkel

Paldam, M. (2007). The big pattern of democracy: A study of the gastil index. *Democracy, Freedom and Coercion: A Law and Economics Approach. Edward Elgar, Cheltenham (UK)*, 103–29.

Post, A. S., & Sen, P. (2020). Why can't a woman be more like a man? Female leaders in crisis bargaining. *International Interactions*, *46*(1), 1–27. https://doi.org/10.1080/03050629.2019.1683008

Regan, P. M., & Paskeviciute, A. (2003). Women's access to politics and peaceful states. *Journal of Peace Research*, *40*(3), 287–302.

Reinhardt, G. Y. (2015). Race, Trust, and Return Migration: The Political Drivers of Post-disaster Resettlement. *Political Research Quarterly*. https://doi.org/10.1177/1065912915575790

Ridgeway, C. L. (2001). Gender, status, and leadership. *Journal of Social Issues*, *57*(4), 637–655.

Ritchie, H. (2020). *Coronavirus Source Data*. European Center for Disease Prevention and Control. https://ourworldindata.org/coronavirus-source-data

Rosette, A. S., & Tost, L. P. (2010). Agentic women and communal leadership: How role prescriptions confer advantage to top women leaders. *Journal of Applied Psychology*, *95*(2), 221.

Rubin, D. B. (1973). Matching to remove bias in observational studies. *Biometrics*, 159–183.

Schultz, T. (2020, April 22). *Why Belgium's Death Rate Is So High: It Counts Lots Of Suspected Covid-19 Cases*. NPR.Org. https://www.npr.org/sections/coronavirus-live-updates/2020/04/22/841005901/why-belgiums-death-rate-is-so-high-it-counts-lots-of-suspected-covid-19-cases

Schwartz, J. (2012). Compensating for the 'authoritarian advantage' in crisis response: A comparative case study of SARS pandemic responses in China and Taiwan. *Journal of Chinese Political Science*, *17*(3), 313–331.

Schwindt-Bayer, L. A. (2006). Still supermadres? Gender and the policy priorities of Latin American legislators. *American Journal of Political Science*, *50*(3), 570–585.

Schwindt-Bayer, L. A., & Mishler, W. (2005). An Integrated Model of Women's Representation. *The Journal of Politics*, *67*(2), 407–428. https://doi.org/10.1111/j.1468-2508.2005.00323.x

Swers, M. (2001). Research on Women in Legislatures: What Have We Learned Where Are We Going? *Women & Politics*, *23*(1–2), 167–185.

Taub, A. (2020, May 15). Why Are Women-Led Nations Doing Better With Covid-19? *The New York Times*. https://www.nytimes.com/2020/05/15/world/coronavirus-women-leaders.html

Taylor-Robinson, M. M., & Heath, R. M. (2003). Do women legislators have different policy priorities than their male colleagues? A critical case test. *Women & Politics*, *24*(4), 77–101.

Terza, J. V. (1998). Estimating count data models with endogenous switching: Sample selection and endogenous treatment effects. *Journal of Econometrics*, *84*(1), 129–154.

The Economist. (2020). *How well have OECD countries responded to the coronavirus crisis?* [Economist Intelligence Unit]. The Economist.

Tripp, A. M., & Kang, A. (2008). The global impact of quotas: On the fast track to increased female legislative representation. *Comparative Political Studies*, *41*(3), 338–361.

White, A. T. (2020, May 12). Women leaders shine during Covid-19 pandemic. *Scope*. https://scopeblog.stanford.edu/2020/05/12/women-leaders-shine-during-covid-19-pandemic/

WHO. (2020). *World Health Organization*. https://www.who.int/gho/database/en/

Windsor, L., Allen, S., Burns, C., Ghanem, R., Yannitell Reinhardt, G., & Windsor, A. (2020). Gender, Leaders, and Language during the Covid-19 Pandemic. *Working Paper*.

World Bank. (2020). *World Development Indicators*. http://data.worldbank.org