Women's leadership is associated with few COVID-19 deaths and better communication

Women's Leadership is Associated with Few COVID-19 Deaths and Better Communication

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Abstract

The ongoing pandemic highlights the significance of early and effective leadership in a crisis. Research suggests that when faced with uncertainty, people prefer women as leaders. We contribute to this literature by examining whether women-led countries had fewer COVID-19 deaths than men-led countries, and whether leader's communications mattered. We use a novel application of the nearest neighbour matching methodology to compare women-led countries with their nearest male-led countries. Using data on COVID-19 deaths from Worldometer as of May 19th 2020, we find that women-led countries had fewer COVID-19 deaths compared to male-led countries. To understand the mechanisms underpinning this relationship, we conducted a qualitative analysis of leader's speeches made between February 15 and April 15, 2020. Compared to men, women leaders were more urgent in highlighting the crisis and empowering their citizens by indicating what they could do. We reflect on implications for the effectiveness of leadership in crisis.

Introduction

The COVID-19 pandemic is one of the most challenging global crises in modern times, combining as it does uncertainty, geographical and sectoral scale, threat to lives and livelihoods as well as liberties. During crises of this kind, the quality of leadership at all levels - national, regional, local, organisational, firm - becomes crucial. Not surprisingly, at the start of the pandemic, a lot of attention was focused on national leadership. This was a period when leaders had to make decisions about curbing liberties and limiting interaction between people and across borders. How quickly they were able to make these decisions and how much they were

able to convince their citizens to comply were a signal of their leadership abilities. This was also a period when institutions had not had time to react so the leader's initial responses were crucial.

In early discussions, female-led countries like New Zealand, Finland and Hong Kong were seen to be performing better than many of the OECD countries. The early contrast between Angela Merkel (Germany) and Jacinda Ardern (New Zealand), on the one hand, and Donald Trump (United States) and Jair Bolsonaro (Brazil) on the other reinforced the speculation that women leaders were more effective in handling the COVID-19 crisis (Guardian, 2020a; 2020b). In this chapter, we analyze this relationship more systematically by asking first, whether COVID-related deaths were systematically correlated with the gender of the leader and second, if they were, then whether this could be related to differences in communication styles across genders. To do this, we use a mixed-methods approach, bringing together data for 194 countries across the world to analyze the first question and collating speeches for a sub-sample of 40 leaders (20 male and 20 female) to qualitatively consider differences in communication styles. Note that while we acknowledge that gender is much more than just biological sex, in categorizing a person's gender for this analysis we have used publicly available information about their sex.

To date, global comparisons of gender differences in the effectiveness of leadership during crises have not been possible because crises are typically idiosyncratic and often localised. There have been, and continue to be, very few women national leaders so that cross-country comparisons are not possible. Studies examining business performance of individual firms, however, indicate that women are effective leaders during difficult times. Ryan et al. (2016) find that women leaders seem to be preferred during business downturns. This preference is supported by empirical findings showing that banks with female CEOs and chairwomen were less likely to fail during the 2008 financial crisis (Palvia, Vahamaa, and Vahamaa, 2015). This may, at least in part, be due to gender differences in attitudes to uncertainty which have been extensively researched. For instance, Barber and Odean (2001) find that while both men and women are often overconfident, men are more overconfident of success in uncertain situations than women. Similarly, Lerner et al. (2003) find that men respond with anger to negative

experiences, which makes them less cautious about future gambles; women respond with caution, making them more prudent in their beliefs and restrained in their actions.

For our empirical analysis in this chapter, we combine publicly available data from Worldometer on the number of reported deaths caused by COVID-19 with the World Development Indicators and UNDP's Human Development Indicators. We collected information on the gender of the leader in each country, identifying the executive leader in particular. The leader's gender is taken as reported in recorded information which limit gender to a dichotomous biological sex variable. Of the 194 countries for which data was available, 20 were led by women (~10%). To account for the imbalance in the sample of male and female-led countries and to ensure that we are not comparing leaders of countries that are very different, we match a female-led country with its 'nearest neighbour' male-led country using a range of socio-economic variables in the matching (as in Garikipati and Kambhampati, 2021). We find statistically significantly fewer deaths in countries with women leaders than in countries with male leaders. To provide insight into the potential mechanisms of this relationship, we collected the leader's speeches during and after lockdown and conducted a qualitative analysis of these speeches.

The chapter proceeds as follows. We provide a brief review of the leadership literature that is used to frame this study. Second, we present the quantitative inquiry into COVID-19 deaths by describing our data construction and methodology. We then report the results of our quantitative analyses. Next, we describe how we put together data for speech analysis and discuss the qualitative results. We conclude by reflecting on what our results mean for effectiveness and diversity in leadership.

Gender and National Leadership

We provide only a brief review of the literature examining gender and leadership effectiveness, as several journals have special issues on that topic, such as American Psychologist (Chin, 2010) and The Leadership Quarterly (Eagly and Heilman, 2016). It is fairly well accepted that leaders can play a crucial role in shaping the fortunes of their nation. There are claims, for instance, that the political history of the last century can be found in the biographies of six men:

Lenin, Stalin, Hitler, Mao, Roosevelt, and Churchill (Keegan, 1998). In their seminal work on national leadership, Jones and Olken (2005) use death of a national leader as an exogenous variation in leadership to show that individual leaders play a crucial role in shaping national growth. Similarly, Besley, Montalvo and Reynal-Querol (2011) find that more competent leaders (in terms of education and skills) result in better national outcomes.

Much of the dominant discourse around national leadership, however, remains heavily masculinized. This is especially problematic as research suggests that the behaviour of women and men leaders is guided by gender stereotypes, according to which women tend to adopt a more democratic, helpful and participative style and a less autocratic or directive style than men (Eagly and Steffen, 2000; Koenig et al. 2011; Chrobot-Mason, Hoobler, & Burno, 2019). Women leaders also tend to be more pragmatic and transformational, whereas male leaders tend to use a passive decision-making style that avoids acting until things get really critical (Eagly, Johannesen-Schmidt, and van Engen, 2003). These gender stereotypes are seen to become more pronounced when managing a crisis (Waugh and Streib 2006).

Research indicates that these stereotypical characteristics may lead to women being sought-out as leaders in times of uncertainty by businesses (Ryan et al., 2011; Ryan et al., 2016). The qualities that make a leader effective in crises are different from those needed in routine day to day operations and women seem to navigate uncertain situations more pragmatically and more resiliently and determinedly than men. This result seems fairly robust across professions (Eagly and Johnson, 1990; Eagly, Karau, & Makhijani, 1995; Ashby, Ryan, & Haslam, 2007). Women's success as leaders could also be linked to their better communication abilities. Research shows that good communications skills are more important for women to be chosen as leaders than for men to become leaders (Lemoine, Aggarwal, and Steed, 2016). Men also tend to be less empathetic (Leonardo Christov-Moore et. al., 2014), which makes their communication with followers more blunt, dominant, and forceful (Zahn, 1989).

Our analysis in this chapter therefore relates to two issues: the link between a leader's gender and COVID outcomes and the differences in communication styles across genders which might have contributed to the outcomes.

Was the Leader's Gender Associated with COVID-19 Deaths?

To empirically analyse whether or not the total number of deaths experienced due to COVID-19 is systematically related to the gender of the national leader, we brought together data from a range of data sources. We obtained information on total deaths due to COVID-19 up to May 19, 2020 from the Worldometer site. We merged this with a range of sociodemographic and economic data from the World Development Indicators and UNDP's Human Development Indicators for 194 countries. We collated data on current women leaders from various websites. For countries that have more than one head-of-state, we make a distinction between the executive head (de facto head) and the titular head (de jure or nominal head) based on the characteristics of the political system. We follow the general rule that in parliamentary regimes, the prime minister is the executive leader, while in presidential systems, it is the president, and in communist states, the chairman of the party is the executive head of state.[1]

With only 20 out of 194 countries being led by women in our data, there is a small sample problem in the data. In addition to this, countries that select women leaders may have specific characteristics that enable them to respond to such crises better. They may be richer, less populous, or have better gender relations. Thus, the method of Ordinary Least Squares (OLS) estimation could suffer from two problems – that of a small number of women-led countries and the potential problem of selection.[2] To correct these problems, we use the nearest neighbor matching method wherein we compare a unit in the treated group (women-led countries) with a unit in the control group that is as similar to it as possible along a range of covariates. Matching is a quasi-experimental technique that provides a more reliable way of comparing two groups when sample sizes are heavily imbalanced and where there may be selection issues (Stuart 2010).

The nearest neighbor matching method pairs each woman-led country in our sample with its closest comparator and estimates the effect of being woman-led on COVID-19 deaths. The matching is done along a range of parameters. In particular, the initial matching is based on four socio-demographic and economic variables that have been seen as important in the

[1]It is worth noting that identifying a country as man- or woman-led was not always straightforward. In Namibia, for instance, the Head of Government is designated as a woman, but the Head of State and Government is a man. On further reading, we assigned it as a man-led country. Switzerland is led by a Council of Members who share power. Since January 1, 2020, the President (for one year only) has been a woman. We, therefore, designated Switzerland as a woman-led country.

[2] For an overview of the OLS method see Gujarati (2009).

transmission of COVID-19: GDP per capita (current USD), population, population density (people/Km2), and population over 65 years. We use these variables to match for a range of reasons. First, we include population, as we might expect the number of deaths to be higher in countries with larger populations. This variable helps us to control for differences in population size. Second, we include GDP per capita, as both the impact of COVID-19 and the ability to respond to it are likely to be influenced by the prosperity of a country. In particular, we might expect that individuals in less densely populated and more prosperous countries are more likely to be able to socially distance than those in heavily populated and poorer countries. In the initial estimates, the GDP variable would also capture the impact of health infrastructure, but we have controlled for this separately in our extension models. Third, we include population density as a matching variable because it has been observed that COVID-19 spreads faster in densely populated regions where social distancing is difficult. Finally, we include population over 65 years because it is clear that COVID-19 is especially fatal among older individuals, with the death rates climbing steeply for those over 60 years. It is worth keeping in mind that while matching by discrete variables is straightforward, exact matching on continuous variables is less likely because two countries are unlikely to have exactly the same population or the same elderly population. This problem is compounded when we match by many continuous variables and this makes the matches less "close."

We test the above results for robustness across the sample as well as across matching variables. In particular, we extend our analysis from the nearest neighbor to the two nearest, three nearest, and five nearest neighbors to consider how robust the effect is. We also extend our matching variables to include three other characteristics – annual health expenditure per capita, number of tourists entering the country, and gender inequality. Each of these variables allows us to control for factors that could be significant in determining the outcome variable.[3]

We may expect that countries that have a better-equipped health system are likely to perform better in the context of a pandemic. We, therefore, extend our matching model by including the

[3] We considered several other variables. Noteworthy among these are "trust" and "risk- aversion" that citizens evince (trusting citizens are more likely to be receptive to emergency policy measures, and risk-averse individuals are more likely to socially distance and wear masks), as well as "timing of election" (countries on track to run elections may have different policy responses in terms of the timing of lockdown). But data limitations for these variables reduced our sample severely. For instance, for trust, we had data for just six women-led countries; for a measure of risk aversion, it went down to four, and for timing of election, it was one as Serbia was the only woman-led country that was scheduled to have elections during the period of study. Despite this, results remained robust (especially on deaths) and are available from authors on request.

annual expenditure on health in each country (current USD). We also match by openness to tourism because the more open a country is to international travel, the harder it will be to control the initial importation of the virus. Third, it has been proposed that countries that have more gender-equitable institutions might well be those that elect women leaders and that such countries' gender equality—rather than their women leaders—may have facilitated their differentially better outcomes. This may not only mean that women find gaining power easier in these countries, but also that women in power may enjoy greater trust and support from a political and social context that perpetuates the acceptance of women leaders and may find it easier to champion cautious policies, if they choose to do so. Indeed, the COVID-19 experience of a group of Scandinavian countries may well fall in this category. Matching by the UNDP's Gender Inequality Index (GII), therefore, allows us to control for these differences between women-led countries and their comparators and to identify the impact of a country being woman-led more precisely. The GII is made up of three distinct components – health (maternal mortality and adolescent birth rate), empowerment (education and number of parliamentary seats held by women), and women's labor market participation.

Results

Table 1 confirms that women-led countries have fared better in terms of absolute number of COVID-19 deaths, with men-led countries having nearly double the number of deaths (~2000) as women-led ones (~1000). Summary statistics for the other variables are presented in the Appendix.

Table 1 COVID Deaths by gender of leaders

	Women-led countries					Men-led countries				
Study variable	*N*	Mean	SD	Min	Max	*N*	Mean	SD	Min	Max
Dependent variables										
Total COVID-19 deaths	20	1,056	2,619	1	9,080	150	1,994	9,046	1	91,981

Source: Dataset constructed by authors as described under Section II.

As discussed above, we use the nearest neighbor matching method, which matches eighteen of the twenty women-led countries in our sample with their nearest neighbor using four matching characteristics – GDP per capita, population, population density, and percentage of elderly dependents – in the baseline model. As the number of matching characteristics increase, the size of the sample falls as we do not have complete information for all countries. In particular,

for the smaller, women-led countries like Aruba and Saint Maarten, we are unable to provide matches even with a baseline model that only matches with population and GDP per capita.

Table 2a presents our results which show that, in the early phase of the pandemic, there were 1,900 fewer deaths in women-led countries than in comparable countries led by men. This result suggests that after controlling for GDP per capita, population, population density, and elderly population, women-led countries performed significantly better than men-led countries. This result remains robust whether we consider a single neighbor, the two nearest neighbors, or even the three nearest neighbors.

Table 2a Comparing COVID-19 outcomes in women-led countries with nearest neighbors (first-step matching)

Specification / Dependent Variable	Nearest neighbor	Two nearest neighbors	Three nearest neighbors
COVID-19 deaths	-1,942.174**	-1,883.039**	-1,885.419**
	(825.987)	(786.827)	(913.729)
Observations	155	155	155

Notes: Standard errors in parentheses. Results for five nearest neighbors are similar. **, * denote statistical significance at the 5 and 10 percent levels, respectively.

We extend the matching to include three other variables that are likely to have an impact on COVID-19 outcomes: the condition of the country's healthcare systems, openness to tourism, and more liberal and equitable gender norms. Table 2b presents the results for these extensions.

We might expect countries with lower ***health expenditure*** and worse health infrastructure to shut down quicker for fear of the inability to cope with the impact of the virus. This was, in fact, the case in many developing countries like India and South Africa. Empirically, however, we find that women-led countries with relatively good health care systems, like Germany, led the decision to lockdown. After controlling for this, we find that women-led countries have significantly fewer (1,900 fewer) deaths than countries led by men (column 2, Table 2b).

Throughout the pandemic, there has been concern that countries that are ***open to international travel*** are likely to be more badly affected by the virus. This was especially the case in the early stages of the pandemic that we are considering in this chapter. Our results show that, after controlling for openness to travel, women-led countries continued to have an advantage in COVID-19 deaths.

Finally, we match also by a ***gender inequality index*** (GII) to consider the fact that countries that elect women are generally more equal and, therefore, likely to have better resilience. We find that, even after matching for the gender-equity indicator, female leadership provides an advantage.

Table 2b Comparing COVID outcomes in women-led countries with the nearest neighbor (extended matching)

Variable	Health expenditure	Openness to tourism	Gender norms
COVID-19 deaths		-1,654.561*	-1,793.428**
	-1,944.306** (834.670)	(919.648)	(874.805)
Observations	147	123	138

Notes: Standard errors in parentheses. **, * denote statistical significance at the 5 and 10 percent levels, respectively.

Do Women Leaders Communicate Differently?

To consider whether gender influences the communication of leaders, we started with the 20 matched pairings of countries as our final sample. This enables us to match countries that are similar to each other so that we are able to judge the differences in communications in isolation. To analyse this qualitatively, we collated the public speeches on COVID-19 given by the leaders of these countries during the early phase of the pandemic when most countries locked down. We found a total of 48 speeches by women and 42 speeches by men. We collected 3 speeches for each leader – one given before the country locked down, one announcing lockdown and one immediately after lockdown. However, not all leaders gave speeches that fitted all three categories. For countries where there was no lockdown, we chose the date with the most restrictions. We therefore ensured that we had the same number of speeches for each matched pairing and this gave us a total of 17 speeches by women and 17 speeches by men. Non-English speeches were translated using google translate. The speeches were coded in NVivo, a qualitative data analysis software, and we followed a strict protocol that minimised subjectivity. One author coded the speeches and a second moderated the codes. The third author provided additional moderation.

Results

We started the speech analyses by examining the frequency and the prominence with which leaders communicated crisis to their citizens. Scanning the speeches specifically for evidence where leaders highlighted the urgency of the situation showed that 11 of the 17 (65%) speeches

by women leaders made a reference to the urgent situation, while 7 of the 17 (41%) speeches by men made similar references. Women also reinforced their message of urgency by repeating them within the same speech (on average twice as compared to the matched men leaders where the repeat rate was 1.43 on average).

We also find that while women gave shorter speeches than men on average (662 words to 735 words), they used significantly more words in their speeches to convey urgency to their citizens: 55 words per speech as compared to 23 words per speech for men. Our analysis revealed three patterns:

i. Women leaders emphasised the crisis more strongly than men.
ii. Women leaders emphasised collective action, whereas men leaders emphasised protection.
iii. Women leaders emphasised life whereas men leaders emphasised the economic impacts.

We will provide some brief evidence for these patterns below. Box 1 below indicates that both Hong Kong's Carrie Lam and South Korea's Moon Jae-in spoke explicitly about the urgent nature of the pandemic but while Carrie Lam reinforced the message about the urgency of the situation in the same speech, Moon Jae-in spoke about the urgency in fewer words and without repeated reference to the crisis.

Box.1. Women Leaders Emphasise Crisis in Communications

Hong Kong, Chief Executive Carrie Lam (25th March 2020): "…as the disease is rapidly spreading overseas, the number of confirmed cases and the speed at which it increases are terrifying. This is a critical moment in the fight against the disease and also a moment for testing the resilience of Hong Kong people in the face of the epidemic"

South Korea, President Moon Jae-in (25th February): "What matters is timing and speed. We must achieve a clear turning point in the ever-increasing number of confirmed cases within this week"

Further analysis of the speeches was essential to understand if there were other material differences in the speeches given by the leaders. We started by filtering out common words (examples: and, it, the) and words that were used equally frequently by both women and men leaders (examples: health, people, situation). This allowed us to identify a list of different words

that appeared most frequently in women and men's speeches. Words used by women leaders suggest that they emphasised the medical nature of the pandemic (quarantine, alert, infection, life) and how individual and collective action could help the situation (community, fight, face, distance, society, citizens).

Figure 1 Female-led vs Male-led countries word frequency in speeches (top 20)

On the other hand, words used by men leaders emphasised protection (worried, vulnerable) with the providers of care being more formal (cabinet, businesses, doctors) though the latter do emphasise distancing and family too. The word clouds therefore suggest that women were urgent in highlighting the dangers associated with the virus but also reinforcing the importance of individual and collective action. Men leaders went into protective and supportive mode, in particular emphasising vulnerability. This might have left individuals feeling that the government had a handle on the situation while they themselves were not in a position to do anything about it. The following excerpts from speeches (*Table.1*) reinforce this:

Box 2. Women leaders emphasise collective action

Excerpts from Women Leader's Communications

Germany, Angela Merkel (speech date: 19th March): "Since the Second World War, there has not been a challenge for our country in which *action* in a spirit of solidarity on our part was so important"

New Zealand, Prime Minister Jacinda Ardern (speech date: 23rd March): "New Zealand is *fighting* an unprecedented global pandemic and it will take a collective effort of every single New Zealander doing the right thing to give us our best shot at curtailing community outbreak"

Men Leader's Emphasise Protection

France, President Emmanuel Macron (speech date: 12th March): "…everything will be done to *protect* our employees and to *protect* our companies at all costs."

Ireland, Prime Minister Leo Varadkar (speech date: 27th March): 'I also promised that we would do all that we could do to *protect* the health of our citizens'.

Finally, Box 3 reflects the different emphasis of men and women leaders, with Lee Hsien Loong speaking about the economic package in place to help citizens whereas Carrie Lam emphasised the virus-related actions being undertaken.

Box 3. Women leaders emphasise on protecting citizens over the economy even before lockdown

Singapore, Prime Minister Lee Hsien Loong (12 March): "Our economy is taking a big hit. That is why we did the $4bn Support and Stabilisation Package in the Budget last month to help businesses, workers and households tide over the immediate period…"

Hong Kong, Chief Executive Carrie Lam (25 February): "As the situation may escalate and the number of people required to undergo quarantine may go up, the departments concerned, together with contractors and suppliers, have wasted no time in constructing isolation and quarantine facilities..."

Our analysis of the speeches suggests that women leaders were much more urgent in communicating the crisis of the pandemic to their citizens. Further, they encouraged their citizens to play their part in containing the virus, whereas men leaders, even when highlighting the urgency of the situation, were less emphatic about the message and focussed on the role of their government in protecting citizens. Their message might have been further diluted by their greater focus on the economic impacts of the pandemic in their speeches.

Discussion

While our results do not allow us to link communication directly with COVID outcomes, we are able to consider whether there might be a plausible link between these factors. Our results indicate that, after matching for a range of factors, deaths were lower in women-led countries than in men-led countries. Our qualitative analysis also indicates that women leaders communicated very differently to men. This might therefore be one channel through which

women leaders had a positive impact in COVID outcomes. We are unable to negate all other possibilities which exist, including that they took decisions more quickly, valued life more than the economy and so on.

Much of the dominant discourse within the leadership literature remains heavily masculinized, with women leaders being asked to "lean in" or conform to behavior expected of a "leader" (Sandberg 2013). Our findings suggest that leadership success is better viewed as being contextual – certain traits being better suited to tackling certain situations. This resonates with the findings of Blair Williams in this volume (Williams, this volume). The pandemic posed a very different kind of challenge and one that is likely to become more common. Given that countries and organizations face varying challenges, diversity in leadership approaches will help to mitigate risk. This is yet more evidence that diversity in leadership is not merely a way of ensuring or signaling gender equality but is crucial to overcome multi-dimensional challenges that the future is likely to bring.

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APPENDIX

Appendix 1 Summary statistics for matching covariates and dependent variables by gender of leaders

	Women-led countries					Men-led countries				
Study variable	*N*	Mean	SD	Min	Max	*N*	Mean	SD	Min	Max
Dependent variables										
Total COVID-19 deaths	20	1,056	2,619	1	9,080	150	1,994	9,046	1	91,981
First-stage matching covariates										
GDP pc (current USD)	18	38,123	26,222	1,326	82,797	158	14,547	23,246	271.8	185,741
Population	20	2.001e+07	3.991e+07	38,717	1.647e+08	174	4.190e+07	1.555e+08	30,231	1.439e+09
Population density	20	675.2	1,569	3	7,140	174	505.3	2,652	0	26,337
Population 65 years and over	18	15.23	5.096	5.158	21.72	162	8.471	6.162	1.085	27.58
Extended matching covariates										
Avg. annual pc health expenditure	13	3,014	2,538	18.75	7,375	159	724.4	1,240	13.59	7,456
Number of international tourists	18	7.151e+06	1.055e+07	178,000	3.888e+07	137	9.196e+06	1.598e+07	14,000	8.932e+07
Gender Inequality Index 2018	13	0.186	0.184	0.0390	0.542	141	0.363	0.186	0.0440	0.834

Source: Dataset constructed by authors as described under Section II.

Appendix 2 Leaders speeches and selected speeches in each timeline

M-led Country	N-1	N	N+1	F-led Country	N-1	N	N+1
Philippines		✓	✓	Bangladesh			✓
Canada	✓	✓	✓	New Zealand	✓	✓	✓
France	✓	✓	✓	Germany	✓		
Ireland	✓	✓	✓	Norway	✓	✓	✓
South Korea			✓	Taiwan	✓		✓
Netherlands		✓		Belgium		✓	✓
Singapore	✓	✓	✓	Hong Kong	✓	✓	
Ecuador		✓		Bolivia	✓	✓	✓
Sweden			✓	Finland		✓	✓
Ireland	✓	✓	✓	Switzerland			✓
Sweden			✓	Denmark		✓	✓
Bulgaria			✓	Serbia	✓	✓	✓