# Maternal Mortality and Women's Political Inclusion: Exploring the impact and pathways of gender equality on maternal health

### Introduction

Despite advancements in health and technology, maternal mortality remains a significant public health challenge around the world. According to the World Health Organization, approximately 287,000 women died from complications related to pregnancy or childbirth in 2020 (WHO, 2023). Recently it was reported that global declines in maternal mortality have stalled, and data from 2020 has shown the pandemic brought a sharp uptick in maternal deaths (New York Times, 2022 & 2023).

Past research has found that factors associated with maternal healthcare, such as the presence of a skilled attendant at birth and antenatal visits, are strongly associated with maternal mortality (Betrán et al., 2005; Girum & Wasie, 2017). Other studies considering social determinants of health have found that factors such as adult literacy, national income levels, and access to water and sanitation are all associated with maternal mortality (Girum & Wasie, 2017).

This research intends to explore the effect of women's political inclusion on maternal mortality while controlling for confounding variables. In addition, this research will examine the mechanism through which women's political inclusion might impact maternal mortality by considering the percentage of skilled attendants at birth as a mediator variable.

### **Research Questions**

**RQ1:** Does women's political inclusion have an effect on maternal mortality? **RQ2:** Is the effect of women's political inclusion on maternal mortality mediated by the presence of skilled attendants at birth?

### **Data Description**

- Dataset was created by putting together several country-level variables, all from 2017, from UNICEF, V-Dems, and the IMF.
- Cross-sectional, cross-national sample with 155 observations representing countries around the world.
- Key explanatory variable: (Political) exclusion by gender index (V-Dems, 2023)
- Mediator variable: Skilled birth attendants (UNICEF, 2021)
- **Dependent variable:** Maternal mortality ratio (UNICEF, 2021)
- **Control variables**: GDP (IMF, 2023), democracy (V-Dems, 2023)
- Because the explanatory variable, dependent variable, and control variable GDP are skewed (see table below), a logged version of these variables will be used for this analysis.

Variable type	Variable	Mean	Median	Min	Max
Explanatory variable	(Political) exclusion of gender index	0.349	0.324	0.014	0.968
Dependent variable	Maternal mortality ratio	177	61	2	1150
Dependent variable	Skilled birth attendants	87.4	97.3	19.4	100







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### Hypotheses

Hypothesis 1: Where gender exclusion is low and political inclusion of women is high, health outcomes are better and maternal mortality is low, even when controlling for variables known to have an effect on both women's political inclusion and maternal mortality. Hypothesis 2: The political inclusion and empowerment of women has a positive effect on national maternal health infrastructure and specifically the increase of skilled attendants present at birth, which in turn has the effect of reducing maternal mortality. In other words, the relationship between gender exclusion and maternal mortality is mediated by the presence of skilled attendants at birth.

### Analysis

**Research Question 1:** To evaluate the effect of gender exclusion on maternal mortality I ran a multiple linear regression, which allows us to model a linear relationship between the dependent variable and several independent variables (key explanatory and confounding). This method enables us to estimate the effect of each independent variable while holding all other variables constant. The result of the linear regression run for this research question is in the leftmost column in the figure below.

	Dependent variable:				
	logMMR		SkilledBirthAtt		
	(1)	(2)	(3)		
logGenderExclusion	0.335***	0.355***	-0.837		
	(0.094)	(0.101)	(1.515)		
Democracy	0.013**	0.009	0.146*		
	(0.005)	(0.006)	(0.084)		
SkilledBirthAtt	-0.025***				
	(0.005)				
logGDP	-0.703***	-0.899***	7.986***		
	(0.074)	(0.067)	(1.011)		
Constant	12.597***	12.149***	18.245**		
	(0.475)	(0.500)	(7.537)		
 Observations		155	155		
R2	0.767	0.730	0.453		
Adjusted R2	0.761	0.725	0.442		
Residual Std. Error 0.83	8(df=150)	0.899 (df = 151)	13.543 (df = 151)		
F Statistic 123.704*** (	df = 4; 150) 13	6.355*** (df = 3; 1	51) 41.660*** (df = 3; 151)		
======================================	*p<0.1; **p	<pre>&lt;====================================</pre>			

**Research Question 2:** To evaluate whether the relationship between gender exclusion and maternal mortality is mediated by the presence of skilled attendants at birth, I performed a mediation analysis. This process involved identifying a model that shows the total effect (the effect of the explanatory variable on the dependent variable without the presence of the mediator variable), and two models that show *indirect effect* (the effect between the explanatory variable and the mediator, and the mediator and the dependent variable while controlling for the explanatory variable). Following that, these models are processed through the mediate() function, which estimates the mediation relationship.



Average Direct Effects (ADE) = c Shows the direct effect of the explanatory variable on the dependent variable.

**Total Effect = a x b + c** Sum of the direct and indirect effects of the explanatory variable on the dependent variable.

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### Results

**Research Question 1:** This analysis found that the explanatory variable (gender exclusion) was found to have a significant effect on the dependent variable (maternal mortality). Once control variables (democracy, GDP, and presence of skilled birth attendants) were introduced, the model became stronger and a better fit, and the effect of the explanatory variable remained statistically significant at the .1% level.

The result of the multiple linear regression model can be interpreted as follows: **when** controlling for democracy, the percentage of births with skilled attendants, and GDP, a 1% increase in the exclusion by gender index leads to a 0.3336% increase in the maternal mortality ratio.

### **Research Question 2:**

The output of the mediation analysis can be seen in the figure below.

- found to be significant.



### Limitations

- not at the 5% level or below.

### Conclusion

This analysis supports the first hypothesis, that where gender exclusion is low and political inclusion of women is high, maternal mortality is also lower. This held true even when controlling for democracy, GDP, and the presence of skilled birth attendants.

This analysis did not, however, support the hypothesis that the effect of political inclusion of women on maternal mortality was mediated by the presence of skilled attendants at birth. In fact, this research found that women's political inclusion did not have a significant effect on the presence of skilled birth attendants. This suggests that the way in which women's political inclusion and empowerment impact maternal mortality is through another mechanism that was not explored in this analysis.

### References

- Maternal mortality, World Health Organization. (2023)

- study in 82 countries. (2017)



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Justine Shakespeare · jnshakespear@umass.edu · DACSS 603: Intro to Quantitative Analysis

• The ACME (average causal mediation effects) accounts for the indirect effect of the explanatory variable (gender exclusion) on the dependent variable (maternal mortality ratio) that goes through the mediator (presence of skilled birth attendants). This was not

• The **ADE** (*average direct effects*) shows the direct effect of the explanatory variable on the dependent variable. This is essentially the same model calculated for Research Question 1. In both cases, the relationship between the explanatory variable and the dependent variable was found to be significant at the 0.001 (.1%) level.

• The **Total Effect** reports the sum of the direct and indirect effects of the explanatory variable on the dependent variable. The effect of the explanatory variable on the dependent variable was found to be significant at the 0.001 (.1%) level.

• The Scale-Location diagnostic plot found slight heteroskedasticity. The results of a Breusch Pagan test shows that there is marginal heteroskedasticity at the 10% level, but

• Cook's Distance diagnostic plot found three outliers.

• The State of the World's Children 2021: Statistical tables, UNICEF. (2021) • Pemstein et al. (2023, V-Dem Working Paper Series 2023:21); V-Dem Codebook • International Monetary Fund. GDP per capita, current prices. (2023)

• Global Declines in Maternal Mortality Have Stalled, New York Times. (2023)

• Maternal Deaths Rose During the First Year of the Pandemic, New York Times. (2022) • Betrán, A.P., Wojdyla, D., Posner, S.F. et al. National estimates for maternal mortality: an analysis based on the WHO systematic review of maternal mortality and morbidity. (2005) • Girum T, Wasie A. Correlates of maternal mortality in developing countries: an ecological