Tragedy Unseen: Unveiling the Factors Behind Migrant Deaths and Disappearances

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1 Introduction

Across the globe, the perilous journeys of migrants often lead to heartbreaking losses, a stark reminder of the human cost of migration. Each year, thousands of individuals vanish, leaving behind a legacy of unanswered questions and unacknowledged grief. This study seeks to explore the factors influencing these migrant deaths and disappearances, employing panel data analysis to understand how demographics and causes of death play a role in these tragedies. [Council of Europe (2024)](Missing Migrants Project, 2024)

We begin by visualizing the distribution of migrant incidents over time using polar charts, followed by a spatial and temporal analysis through an animated global map. Subsequently, we delve into an econometric panel data analysis to further understand these grim statistics. (Thorne, 2021)

1.1 Research question

What are the factors that influence the total number of deaths and missing children in migrant incidents across regions and time?

2 Methodology

We utilized data from the Missing Migrants Project provided by the IOM (International Organization for Migration, 2024). The analysis begins by cleaning the data, filtering for incidents with a source quality of 4 or higher.

To visualize temporal trends, we created polar charts displaying deaths (**Figure 2.1**), missing persons, survivors, and total incidents across different years. Next, we visualized the spatial and temporal distribution of migrant incidents through an animated global map (**Figure 2.2**).

For econometric analysis, we performed panel data regressions, including `Pooled OLS`, `Fixed Effects`, and `Random Effects` models, to identify factors influencing the number of deaths and missing children during migration incidents.

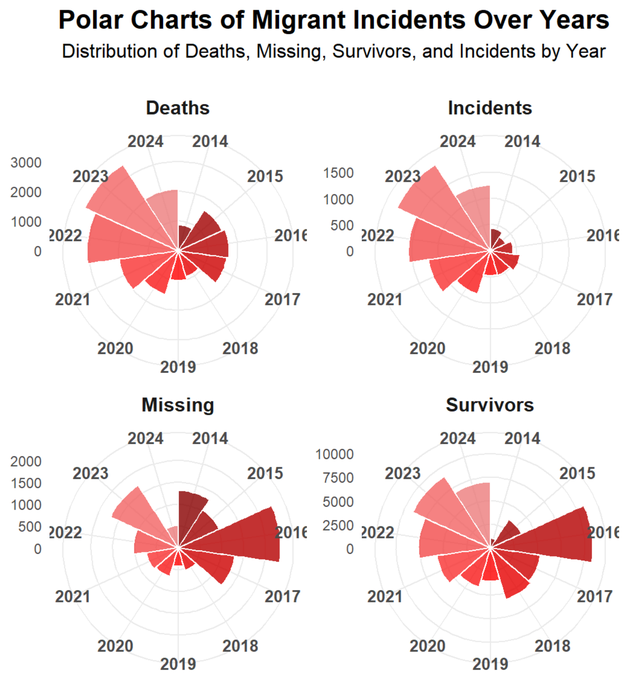

Figure 2.1: Polar Charts of Migrant Incidents Over Years. Distribution of Deaths, Missing, Survivors, and Incidents by Year.

The polar charts (**Figure 2.1**) reveal interesting temporal patterns. The number of deaths remains high between 2014 and 2017, decreasing in the following years. The number of missing persons also presents a similar pattern, but with a more volatile behavior. The survivor counts show a different behaviour, with an overall increase in later years.

The total number of incidents appears to have its maximum around 2017 and decreases in the following years. These visualizations suggest that while the number of reported deaths and missing persons has decreased, the survival rates have shown improvements over the last few years.

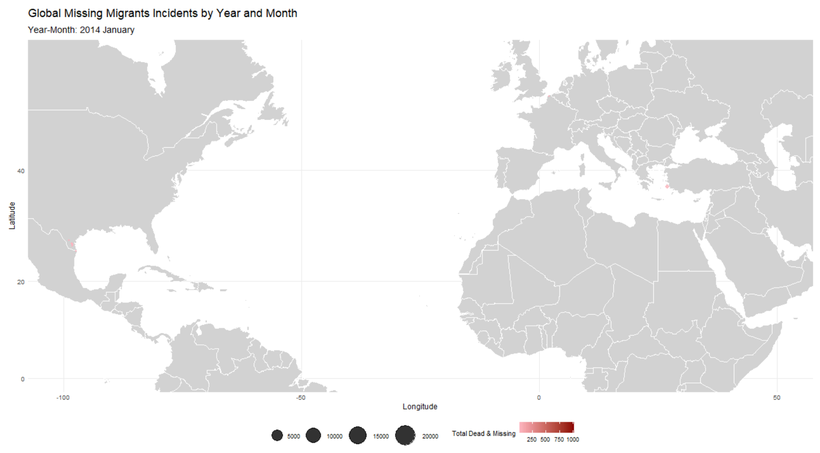

Figure 2.2: Animated Global Map of Missing Migrants Incidents by Year and Month.

The animated map (**Figure 2.2**) effectively shows the geographical distribution of incidents over time. It highlights the **Mediterranean Sea** as a critical area for migrant deaths, with notable incidents occurring in **Central America** and along the borders between **Mexico and the United States**.

The animated map shows that these incidents are relatively constant over time, emphasizing the continuous danger migrants face along these migration routes.

3 Results

The panel data analysis investigates the factors influencing the number of deaths and missing children, controlling for region and time. **Table 3.1** presents the results of key statistical tests, and **Table 3.2** displays the estimation results for `Pooled OLS`, `Random Effects`, and `Fixed Effects` models, alongside their robust counterparts.

Table 3.1: Results of Statistical Tests

Test	p-value	H0	Conclusion
Robust Hausman	0.93	use random effects	use Random Effects
Breusch Pagan (Pooled OLS, Homosk.)	4.7e-135	Homosk.	Heterosk.
Breusch Pagan (FE, Homosk.)	4.7e-135	Homosk.	Heterosk.
Breusch Pagan (RE, Homosk.)	4.7e-135	Homosk.	Heterosk.

The `Robust Hausman test`, with a p-value of 0.308, suggests that the `Random Effects` model is more appropriate than the Fixed Effects model for our analysis. The Breusch-Pagan tests indicate the presence of heteroskedasticity in all models ($p - value < 0.05$), making robust standard errors essential.

Table 3.2: Results of Statistical Models

Model	Females	Males	Survivors	Drowning
Pooled OLS	0.274 ***	0.077 ***	0.026 ***	0.078 ***
Fixed Effects	0.275 ***	0.069 ***	0.021 ***	0.049 ***
Random Effects	0.275 ***	0.069 ***	0.021 ***	0.048 ***
Robust Pooled	0.274 ***	0.077 ***	0.026 ***	0.078 ***
Robust Fixed Effects	0.275 ***	0.069 **	0.021 ***	0.049 **
Robust Random Effects	0.275 ***	0.069 **	0.021 ***	0.048 **

Table 3.2 shows that the number of females and males involved in a migration incident are significant predictors of the number of children deaths and missing persons. The coefficient of $\log(\text{Number\_of\_Females} + 1)$ shows a positive impact across all models. The $\log(\text{Number\_of\_Males} + 1)$ also presents a positive influence, with similar values, across all models.

Moreover, a higher number of survivors is negatively related with child deaths and missing, which is expected.

Finally, the positive coefficient of `Drowning` indicates that incidents caused by drowning are positively associated with child deaths and missing, which is expected since drowning incidents usually involve larger groups of people.

4 Next Steps

Further research could explore additional factors such as the role of smuggling networks and the degree of conflict in the countries of origin. Expanding the dataset with additional socioeconomic and political variables could provide further insights.

It would be interesting to control for the political regime and levels of corruption in the countries. Analyzing the different migration routes could also reveal important patterns not captured in this analysis.

5 Conclusion

Our analysis provides a comprehensive examination of factors influencing migrant deaths and disappearances. The visualization of temporal and geographical data reveals critical regions and time periods of high risk, while the econometric analysis highlights significant relationships between demographics, causes of death, and the number of child deaths and missing persons during migration incidents.

Specifically, the significant impact of the number of female and male migrants, the negative impact of the number of survivors and the positive impact of drowning in incidents of death and missing children call for further investigation and targeted strategies.

References

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