Between Borders: Factors Influencing Children Deaths and Disappearances

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1 Introduction

The deaths and disappearances of migrants while on the move are a key concern across the world. There is a serious need to investigate the factors behind it properly. Since 2014, statistics indicate that at least 4,000 people have perished every year on migration routes, and 2022 was the worst year, with more than 8,500 deaths. [Council of Europe (2024)](Migration Data Portal, 2024) In particular, children need special attention, as this demographic is particularly vulnerable due to their age. (Global Migration Data Portal, 2024)

The present study begins by illustrating the temporal and spatial distribution of these events using polar diagrams and an animated globe. Following this, an econometric panel data analysis will be employed to provide more detailed insights, to inform policy interventions to prevent future occurrences. (Thorne, 2021)

1.1 Research question

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

2 Methodology

The current research reports data collected from the **Missing Migrants Project** (International Organization for Migration, 2024)for the period from 2014 to 2024, which resulted in $5,462$ entries after some preprocessing. Preprocessing involved the elimination of duplicates, filtering for high-quality source information, and the selection of relevant variables, identified through literature, theoretical considerations and variables available in the dataset. Furthermore, enrich the analysis with contextual factors such as country GDP and political regime. However, data on migrant populations within specific borders at given times, crucial for a robust analysis, proved challenging to obtain consistently across all regions and periods.

We transformed our variables by using dummy variables for the `Cause of Death` and logarithmic transformations for non-normal distributions considering skewness and kurtosis analyses. Linear relationships were incorporated into the model due to theoretical reasoning and literature on the topic. For our analysis, we employed panel data regressions, analyzing `Pooled OLS`, `Fixed Effects`, and `Random Effects` models. Econometric tests (including `Breusch-Pagan` and `Hausman tests`) were conducted to determine which model was most appropriate for the data. This approach allows us to isolate key factors and provide insights to inform interventions aimed at preventing future incidents.

3 Initial Analysis

The polar charts (**Figure 3.1**) reveal notable temporal patterns. The number of deaths shows a general increase over the years, but a decrease in 2018 and 2019. The number of missing persons presents some oscillations, with peaks around 2016 and 2023. The number of documented incidents shows a steady increase until 2023. Finally, the survivor counts show an overall increasing trend with a peak around 2016.

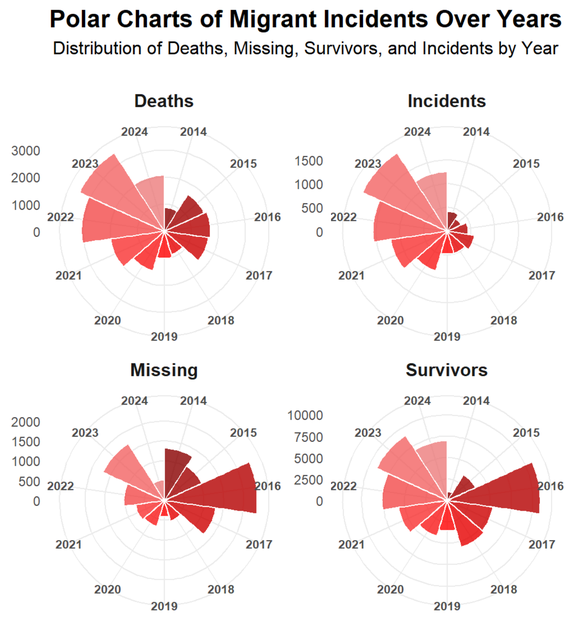

Figure 3.1: Polar Charts of Migrant Incidents Over Years. Distribution of Deaths, Missing, Survivors, and Incidents by Year.

The animated map (**Figure 3.2**) 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 USA**.

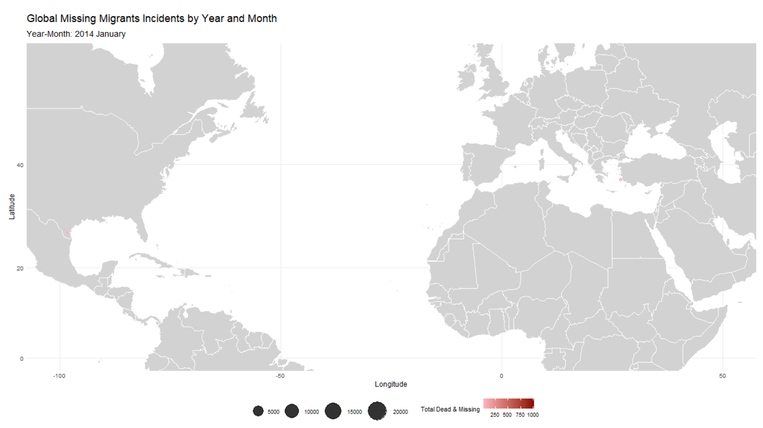

Figure 3.2: Animated Global Map of Missing Migrants Incidents by Year and Month.

4 Results

The panel data analysis investigates the factors influencing the number of deaths and missing children, controlling for **continent** and **time**. **Table 4.1** presents the results of key statistical tests, and **Table 4.2** displays the estimation results for Robust Random Effects.

Table 4.1: Results of Statistical Tests

Test	p-value	H0	Conclusion
Breusch Pagan (POLS)	< 2.2e-16	Homosk.	Heterosk.
Breusch Pagan (FE)	< 2.2e-16	Homosk.	Heterosk.
Breusch Pagan (RE)	< 2.2e-16	Homosk.	Heterosk.
Robust Hausman	0.929	Random Effects	Random Effects
Lagrange Multiplier (Breusch Pagan)	< 2.2e-16	No Panel Effects	Panel Effects

The `Breusch-Pagan` **tests**, regardless of the type of model used, suggest the presence of **heteroskedasticity** (p-value < $\alpha = 5\%$). This gives statistical evidence that the errors are not homoscedastic, hence the need for the use of **robust standard errors**.

`Lagrange Multiplier` **test** (Breusch & Pagan, 1980) (p-value < $\alpha = 5\%$) supports that the **Random Effects** model is more appropriate than the **Pooled OLS** model.

For the `Robust Hausman` **test** performed, we obtained the p-value of 0.929. This result suggests that the `Fixed` **and** `Random Effects` **Models** are consistent, but the only the latter is efficient.

Table 4.2: Random Effects Model With Robust Standard Errors

	Estimate	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.000	0.027	0.000	1.000
log(Number of Females)	0.275	0.062	4.428	0.000 ***
log(Number of Males)	0.069	0.026	2.650	0.008 **
log(Number of Survivors)	0.021	0.006	3.301	0.001 ***
Drowning	0.048	0.015	3.240	0.001 **

Table 4.2 presents the results from our `Robust Random Effects` model, which examines factors influencing child deaths or missing (D&M) in migrant incidents. Both `log(Number of Females)` and `log(Number of Males)` show positive coefficients, as an increase in overall D&M is expected to correlate with increased child D&M. However, the coefficient for `log(Number of Females)` is substantially larger (0.275) than that of `log(Number of Males)` (0.069), indicating a more pronounced effect. Specifically, a 1% increase in the number of female D&M is associated with a 0.275% increase in the number of children D&M. This suggests that women, often primary caregivers, may offer a higher degree of protection to children, and their deaths can subsequently elevate the risk for those children.

Additionally, the `Drowning` dummy variable has a positive coefficient of 0.048. This result indicates that, ceteris paribus, drowning incidents are associated with approximately a 4.92% $[(e^{0.048} - 1) \times 100]$ increase in the expected number of children D&M compared to other causes of death.

5 Conclusion

Our analysis reveals critical patterns in migrant deaths and disappearances. Geographically, the Mediterranean, Central America, and the US-Mexico border are high-risk areas.

The panel data analysis highlights a strong link between the number of female fatalities, which revealed to be the biggest factor for child incidents in our study, and increased child deaths and disappearances, underscoring the vulnerability of women and children. Drowning incidents also significantly increase risks.

5.1 Next Steps

Further research should investigate the role of smuggling networks and conflict levels in countries of origin, considering the implications for policy development.

Expanding data to include socioeconomic and political factors could provide additional context, while analysing specific migration routes might reveal further critical patterns.

Ultimately, these findings should guide the development of policies to protect migrant lives, particularly for vulnerable populations such as women and children.

References

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