

War-related media narratives and fertility in Poland

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Extended Abstract

Contemporary societies face mounting uncertainty driven by climate change, economic instability, and geopolitical conflict across and beyond Europe. Fertility decisions are profoundly conditioned by how individuals envision and evaluate their future (Vignoli et al., 2020; Matysiak & Vignoli, 2024), making fertility responsive to this increase of perceived insecurity and uncertainty. Existing studies have explored the effects of economic crises (Comolli, 2017; Guetto et al., 2023) and, more recently, environmental anxieties (Clayton, 2020; Puglisi et al., 2025) on fertility outcomes and intentions. A new generation of studies has now begun to examine how exposure to geopolitical insecurity and armed conflict is associated with fertility and demographic behavior (Thiede, Hancock, Kodouda & Piazza, 2020).

The ongoing Russia–Ukraine conflict has profoundly affected mental health across neighboring regions, especially Poland. Studies have considered how proximity to armed conflict in a neighboring country—such as Poland’s indirect exposure to the Russia–Ukraine war—may affect fertility and related aspects of reproductive health (Błaszczuk et al., 2025; Krakhmalova, & Kloc-Nowak, 2025). The levels of anxiety symptoms were reported by over 80% of respondents during the first month of the war and by around two-thirds in the second month (Błaszczuk et al., 2025). These findings reflect widespread fears of potential national involvement, intensified by Poland’s close historical, economic, and cultural ties with both Russia and Ukraine, and a growing public sentiment that “*it may only be a matter of time before we are next*”. In addition, Chudzicka-Czupała et al. (2023) report that 80.3% of Polish respondents were distressed by war-related media narratives during March–April 2022, underscoring the psychological reach of indirect conflict exposure.

War-related media narratives are inherently dynamic, evolving alongside shifting geopolitical realities, including transitions from active conflict to protracted tension, escalation or resolution of wars, and changes in political leadership or alliance, therefore they shape expectations about the future that can influence fertility decision-making. Moreover, exposure to graphic or repeated war coverage is linked to elevated stress and poorer functioning in the general population, underscoring one pathway through which media narratives may affect perceptions and behavior (Holman et al., 2014; Holman et al., 2024; Li et al., 2024). Despite these concerns, the role of geopolitical insecurity in the form of war-related media narratives, remains largely unexplored in demographic research. This paper therefore examines how war-related media narratives are associated with fertility indicators in Poland. Since 2014 beginning with the annexation of Crimea, through subsequent migration crises, and following Russia’s full-scale invasion of Ukraine in 2022, Polish public discourse has been permeated by evolving narratives of conflict and defense. The changing nature of the war in Ukraine, together with shifts in domestic and European political leadership, has continually redefined notions of security, vulnerability, and national resilience, thereby reshaping collective perceptions of the future. War-related media narratives may thus influence fertility behavior by amplifying uncertainty and discouraging family formation. This study seeks to address the following question: *To what extent do fluctuations in war-related media narratives correspond with changes in regional fertility indicator in Poland between 2014 and 2025?*

Our analysis builds on the Narrative Framework (Vignoli et al., 2020), which highlights how imagined futures shape fertility behavior. Just as economic narratives can be associated with fertility behavior (Guetto et al., 2023) by shaping perceptions of stability and opportunity, war-related media narratives may similarly alter individuals’ sense of predictability and security regarding the future. We propose that war-related media narratives operate through a discouraging effect, whereby such narratives amplify existential uncertainty and perceptions of threat, prompting to delay or forgo childbearing.

Poland offers a natural case study: it shares a border with Ukraine yet remains demographically characterized by persistently low fertility despite extensive family-support policies such as *Rodzina 500+*. According to Statistics Poland (Główny Urząd Statystyczny, GUS), the total fertility rate (TFR) declined from 1.45 in 2017, shortly after the introduction of *Rodzina 500+*, to 1.26 in 2021 and further to 1.19 in 2023, among the lowest in the European Union (GUS, 2024). This sustained decline, despite generous

pronatalist incentives, highlights the growing role of social, cultural, and uncertainty factors in shaping fertility patterns.

Data and Methods

Recent advances in computational social science have demonstrated the value of large-scale text analysis for examining public discourse and social dynamics. Studies have applied topic modeling and semantic analysis to diverse corpora, from military and political communication (Albertini, Giacomello, & Zinnatullin, 2025) to media exposure and gender diversity debates (Aslanbeigui, Ramirez, & Petchel, 2025). Building on these developments, we apply natural language processing (NLP) methods to a longitudinal corpus of Polish media to capture the salience and framing of war-related media narratives over time.

We construct a longitudinal corpus of Polish media and political discourse spanning 2014–2025, encompassing major national outlets across the political spectrum, including pitlests such as: *Gazeta Wyborcza*, *Rzeczpospolita*, *Newsweek Polska*, *Polityka*, and *Do Rzeczy*. The dataset is sourced from Event Registry (ER), a global news aggregation platform frequently used in computational social science research for tracking media narratives across time and regions (Leban et al., 2014). Textual data are processed using natural language processing (NLP) techniques. Specifically, we apply BERT-based sentiment and semantic analysis (Devlin et al., 2019) alongside cosine similarity measures to quantify the salience and emotional tone of war-related discourse. The resulting war-narrative intensity scores are standardized monthly and aligned with regional fertility indicator from Statistics Poland (GUS) to facilitate time-series analysis. We use as fertility indicator monthly crude birth rate (CBR) data from GUS for the period 2014–2024, disaggregated by region (voivodeships). This multi-layered approach enables the systematic quantification of how fluctuations in war-related media narratives, both in volume and framing, correspond with fertility indicator over time, building on recent research linking media sentiment to macro-social and demographic dynamics (Gentzkow, Shapiro, & Stone, 2016).

Analytical Strategy

We link war-related media narratives, operationalized through the war narrative intensity score, to fertility indicator using time-series analytical techniques. Specifically, we employ vector autoregressive (VAR) models and Granger causality tests to assess whether fluctuations in war-related media narratives precede changes in monthly fertility rates across Polish regions (Granger, 1969; Lütkepohl, 2005). We then test the series for cointegration, and if a long-run equilibrium relationship is identified, we estimate a Vector Error Correction Model (VECM) to capture both short-term adjustments and long-term dynamics.

To capture potential nonlinear and lagged dependencies beyond standard Granger causality, we additionally implement Time-Warping Transfer Entropy (TWTE), which enables the detection of asymmetric and temporally misaligned information flows between war-related media narratives and fertility indicator (Barnett & Bossomaier, 2012; Hlaváčková-Schindler et al., 2007). This combined approach allows for a robust and comprehensive assessment of the temporal dynamics linking collective war-related media narratives to fertility trends in Poland.

Expected Findings

Based on theoretical expectations, we anticipate that periods of intensified war-related media narratives, particularly during major escalation points such as the 2014 annexation of Crimea, the 2021 military buildup along the Ukrainian border, Russia’s full-scale invasion of Ukraine in February 2022, the Bucha massacre (April 2022), the missile explosion in Przewodów, Poland (November 2022), will be associated with declines in monthly birth rates, especially in regions in the East of Poland. We expect that exposure to war-related media narratives will be negatively correlated with fertility indicator, reflecting the discouraging effect of heightened perceptions of threat and uncertainty. The magnitude of this relationship is likely to vary according to the intensity and tone of media discourse, with more alarming or persistent narratives expected to exert a stronger impact on fertility indicator. Furthermore, prolonged exposure to such narratives may lead to “fatigue effects” whereby the population becomes gradually desensitized, thereby reducing fertility responsiveness to ongoing war-related media narrative over time.

Contribution and Significance

This study offers one of the first analysis of how war-related media narratives shape fertility. By integrating demographic data with natural language processing (NLP) techniques, this study advances understanding of how macro-level imaginaries of war and insecurity translate into demographic patterns. The study extends the Narrative Framework (Vignoli et al., 2020) beyond economic and environmental domains, demonstrating that narrative on conflict and security also play a crucial role in shaping fertility indicator. More broadly, the paper positions Poland as a critical case for exploring demographic resilience and vulnerability under geopolitical uncertainty. The findings highlighting how collective imaginaries, circulated and amplified through media, can shape intimate, future-oriented decisions such as childbearing.

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