Exploring Socioeconomic and Demographic Trends in Armenia and Its Neighbors

Data Visualization – Summer 2025 Project

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Overview

This report explores long-term socio-demographic, political, and public health trends in Armenia and selected post-Soviet states from 1958 to 2022, with a focus on population, life expectancy, corruption, urbanization, and gender-related indicators. It examines how Armenia, despite facing war, blockade, and isolation, demonstrates demographic resilience unusual for a state under chronic geopolitical stress. By leveraging multiple datasets, the project contextualizes visual patterns within broader political, historical, and economic frameworks. The report aims to assess how well traditional metrics like birth rate, life expectancy, and corruption indices capture the lived effects of regime change, disaster, and modernization in Armenia.

Before delving into empirical findings, it is essential to understand the structure and origin of the data used in this analysis. The dataset, compiled from multiple international indicators, serves as the foundation for evaluating Armenia's long-term development trajectory.

Data description

The dataset used in this project was manually compiled from multiple sources hosted on the Our World in Data platform. It includes annual time-series data for Armenia and several post-Soviet states (e.g., Georgia, Azerbaijan, Estonia) from 1958 to 2022. Variables encompass a wide range of demographic, socio-political, and economic indicators such as:

- Life Expectancy (total, male, female)
- Birth and Death Rates
- Child Mortality Rates
- Sex Ratio at Birth
- Urban Population Percentage Population
- Totals Democracy and Corruption Indices
- Regime Type
- Notable Historical Events (coded manually)

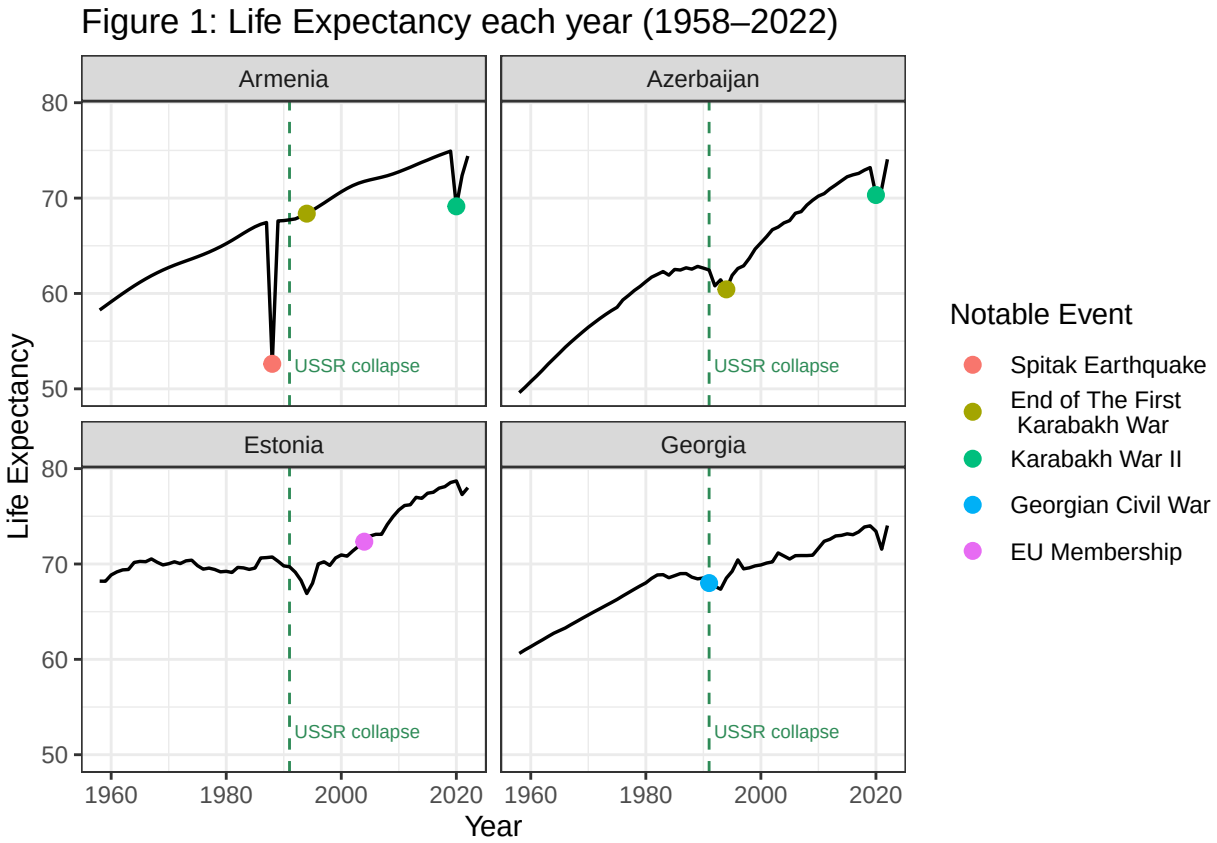
Data was collected from over a dozen downloadable tables and merged manually.

Literature review

Numerous studies address the "transition crisis" in former Soviet states, especially its impact on mortality, fertility, and governance. Notably, Cornia and Paniccià (2000) describe the post-Soviet health collapse as a result of rapid privatization and institutional voids. Regarding corruption, Ledeneva (2006) explores the persistence of "blat" (informal networks) in post-Soviet systems, complicating transparency reforms. In terms of gender bias, Guilmoto (2009) , UNFPA Armenia (2013) and Cambridge (2024) have reported Armenia's skewed sex ratios and cultural-son preferences. On urbanization reversals, Buckley and Tsenkova (2001) note that post-socialist housing markets contributed to unique migration trends not seen in Global North urbanism. Armenia's resilience, therefore, challenges conventional wisdom on the uniformity of post-Soviet decline.

Plots and Analysis

We begin our analysis by examining life expectancy trends. This indicator reflects both health infrastructure and broader social conditions, making it a valuable proxy for assessing national resilience



Notable events shown include armed conflicts, political milestones, and natural disasters. For a full list with casualty estimates and references, see Appendix B.

To see a definition of Life Expectancy, see Appendix A.

The above plot reveals life expectancy trends in four post-Soviet republics-Armenia, Azerbaijan, Georgia, and Estonia—annotated with major historical disruptions. All four countries exhibit a visible stagnation or decline in life expectancy in the early 1990s, immediately following the USSR's dissolution in 1991. This decline, particularly sharp in Armenia, Georgia, and Azerbaijan, aligns with what some economists and demographers term the "transition crisis"—a collapse of public institutions, health systems, and economic

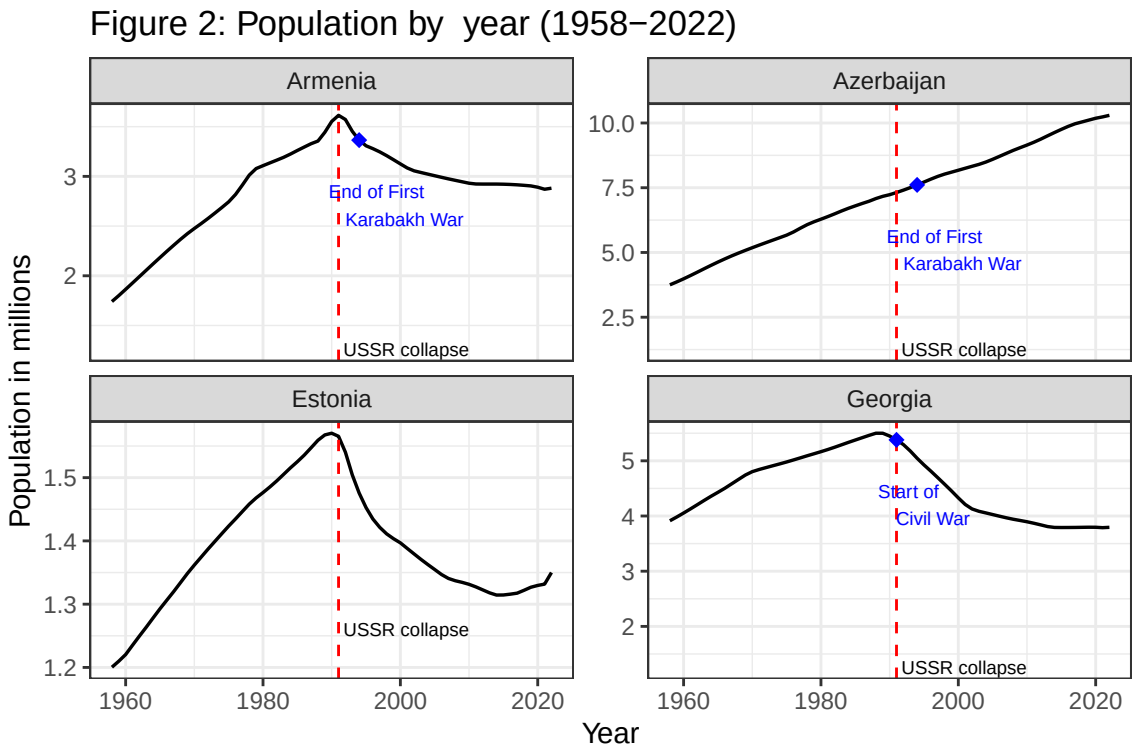
stability following the shift to market economies. Estonia, in contrast, exhibits only a minor dip in life expectancy. Estonia swiftly oriented itself toward EU integration, adopting rapid liberalization and receiving Western institutional support, culminating in EU accession in 2004, which is annotated on the graph. Estonia's life expectancy trends suggest that Western institutional alignment (gaining EU membership) had measurable impacts on public health.
Armed conflicts of the early 90s have had a major impact on the 3 countries of the Caucasus. The least impacted was Armenia with only a minor dip and/or stagnation of life expectancy, in contrast, the same war (the first Karabakh war) had a much stronger effect on Azerbaijan. Georgia shows a prolonged stagnation in the 1990s, worse than Armenia or Azerbaijan. The Georgian Civil War (1991–1993), along with conflicts in Abkhazia and South Ossetia, and state collapse under Shevardnadze, led to a near-total breakdown in social services.
The most devastating occurrence in Armenia was the Spitak earthquake which caused major death and destruction, but the sharp recovery the following years shows that despite the scale of the tragedy, public resilience and Soviet-era disaster response structures were temporarily effective.
Important to highlight the resilience of Armenia's life expectancy as a striking anomaly, especially when benchmarked against regional peers like Georgia and even more developed post-Soviet states like Estonia. This pattern defies expectations based on conventional demographic predictors—armed conflict, economic blockade, and isolation typically drive life expectancy downward. Yet Armenia exhibits a steady upward trajectory, interrupted only by truly catastrophic events (Spitak Earthquake in 1988 and Second Karabakh War in 2020).
Some suggestions are listed below

- Armenia inherited a high literacy rate, strong medical education, and preventive healthcare infrastructure from the USSR. Even though economic collapse degraded much of this, the cultural and institutional remnants persisted Armenia maintained universal basic education, widespread vaccination coverage, strong maternal and infant care culture.
- Armenia benefits enormously from its global diaspora, which sends aid (up to 13% of GDP in some years), funds local clinics, hospitals, and medical aid, enables medical tourism. Diaspora aid partially offsets the blockade.
- Armenians place high cultural value on education and family, which correlates with better maternal-child health, lower alcohol abuse, robust elderly care within extended families. There is evidence from global health that strong family systems mitigate the worst effects of poverty on life expectancy.

Armenia is one of the rare cases where war, blockade, and geopolitical isolation have not translated into demographic collapse.

The below plot shows the population change of 4 former Soviet countries from 1958 to 2022.

Armenia's Population Change: Armenia's population peaked at nearly 3.7 million in the late 1980s but has declined sharply since independence in 1991, to just over 3 million in 2021, largely as a result of its decreasing fertility rate and negative net emigration rate. The decline was driven by multiple factors: Many Armenian emigrants in the early 1990s were people who had lost jobs after the severe 1988 Spitak earthquake, refugees and people fleeing the economic and energy crises of 1992-95. Almost half a million people left the country during this period, and approximately 100,000 persons or 3 percent of the country's population, emigrated during the beginning of 1990s due to political internal and external instability. The continued stagnation reflects ongoing emigration of working-age adults and persistently low birth rates (shown later on).



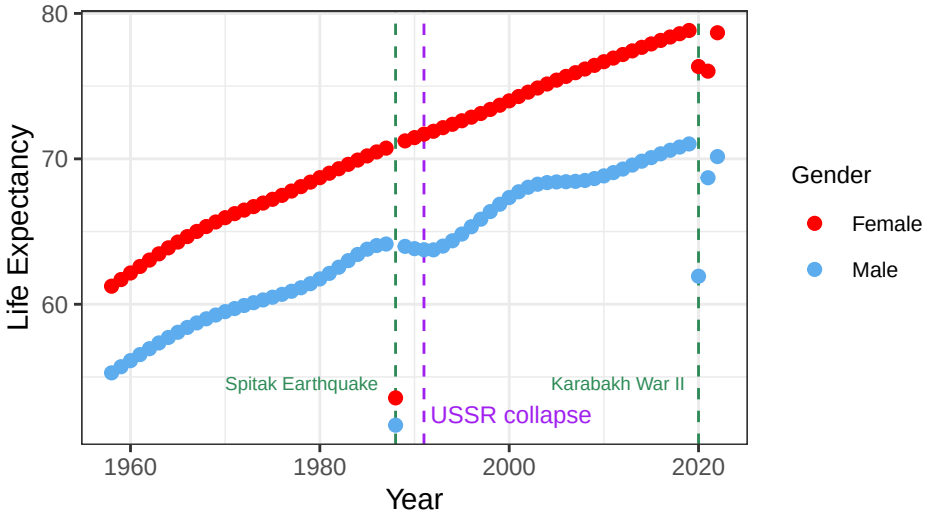
Azerbaijan's Population Change: Azerbaijan's population growth continued despite conflicts, likely because internal displacement from Karabakh was absorbed within Azerbaijan's borders. Regarding population counting, international organizations typically count territories based on internationally recognized borders, so Karabakh's population would be included in Azerbaijan's official statistics. Also, important to mention the fact that Azerbaijan has limited and unreliable population statistics due to media freedom being severely curtailed and official numbers have been put under scrutiny, often being labeled as an overestimation.

Georgia's Population Change: From 1992 the population began to decline sharply due to civil war and economic crisis driven mass migration throughout the 1990s and into the early 2000s, and Georgia lost more than one million people or almost 20 per cent of its population between independence and 2002. The emigration of ethnic minorities has also left an impact. The number of Russians living in Georgia has dropped significantly over the past 20 years. The 2002 census recorded nearly 68,000 ethnic Russians living in Georgia, a figure that at the time constituted about 1.5 percent of the total population. That total marked a steep decline from the 341,000 Russians (6.3 percent of the population) counted in 1989. Like Armenia Georgia's population has stagnated over the past decade.

Estonia's Population Change: Following independence, immigration slowed greatly, and many Russians left the country, with a net population loss of about 90,000 between 1989 and 1994, but the outflow slowed in the late 1990s. Estonia also has a very low birth rate, a problem crippling most EU members.

The below plot shows the difference between the sexes in Armenia from 1958-2022.

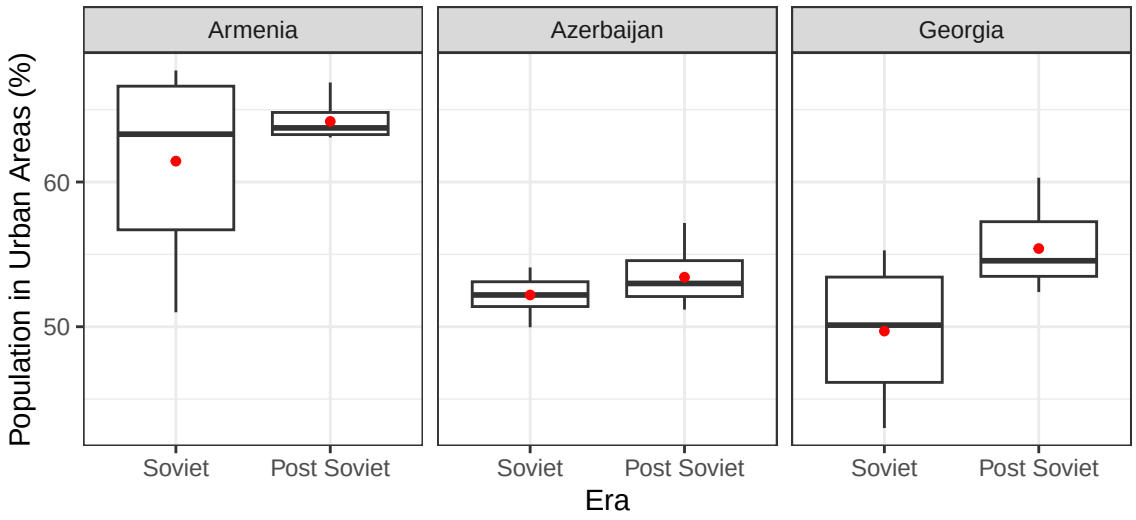
Figure 3: Life Expectancy in Armenia by Gender (1958−2022)



This gender-disaggregated data reveals nuances about how the Soviet collapse differently impacted men and women in Armenia. The most striking pattern is the stark divergence in recovery trajectories: while female life expectancy maintained its steady upward trajectory with only minor disruption around 1991, male life expectancy experienced a much more severe and prolonged crisis. The gender gap in life expectancy widened dramatically from about 7-8 years in the Soviet era to nearly 10 years by the early 2000s. This reflects the classic post-Soviet male mortality crisis, though life expectancy declined dramatically in the first half of the 1990s, particularly for males across the former USSR. However, Armenia's pattern is notable because adult mortality patterns in Armenia have been more favorable than in Russia, due to a large extent to lower mortality from alcohol-related causes. The most interesting aspect is the recent convergence trend, while male life expectancy has recovered significantly since the early 2000s (except for the 2020 war), female life expectancy has actually plateaued or slightly declined in recent years, most likely due to the coronavirus pandemic. This suggests that Armenia may have had improvements in male-specific mortality causes (possibly violence, accidents, or cardiovascular disease).

Urbanization reflects long-term economic and demographic shifts. In the post-Soviet space, urban population percentages reveal both internal migration patterns and the legacy of centrally planned development.

Figure 4: Percentage of Population in Urban Areas Across Eras by Country (1958–2022)



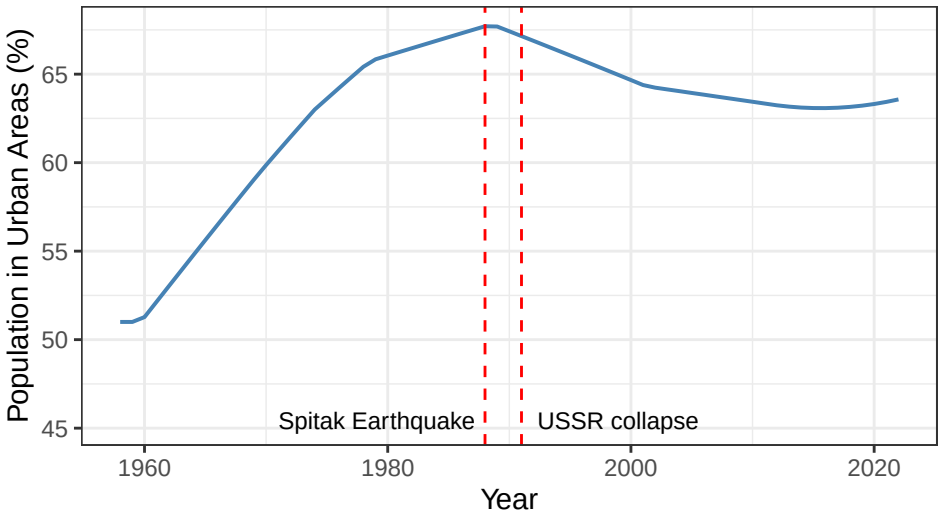
The red dot represents the mean of the box plot of the respective era.

This urbanization plot reveals dramatically different Soviet modernization trajectories and post-collapse urban strategies across the three countries, reflecting their distinct economic structures and political priorities.

Armenia's Urbanization: Armenia's Soviet urbanization shows the most dramatic transformation - from 1929 to 1936, the government began the process of industrialization, compelling many living in the rural countryside to settle in urban areas. At the time of the republic's dissolution, close to 70 percent of its population lived in urban areas. For a post Soviet analysis see the below plot.
Azerbaijan's Urbanization: Azerbaijan maintained relatively stable, moderate urbanization levels throughout both periods. Azerbaijan's population is approximately 57% urban and 43% rural currently, showing continuity with Soviet patterns. This reflects Azerbaijan's oil-based economy, which required less dramatic rural-to-urban population shifts compared to Armenia's heavy industrialization strategy.

Georgia's Urbanization: Georgia shows the most dramatic increase in urbanization - jumping from around 50% in the Soviet period to nearly 60% post-collapse. This might be explained by the large population drop that Georgia has faced, especially in rural areas. This time-series plot for Armenia provides crucial nuance that corrects and deepens our earlier analysis of the country's urbanization patterns.

Figure 5: Percentage of Population in Urban Areas in Armenia (1958–2022)



To see a definition of % of Urban Population, see Appendix A.

The above time-series plot of Armenia's urbanization from 1958 to 2022 provides more nuance.
The percentage of the population residing in urban areas peaked in 1988 with 68%. After the destructive earthquake, urbanization began to drop up to the late 2010s.
The drop in urbanization following 1988 was driven by a cascade of crises:

- 1988 Spitak Earthquake destroyed 90% of buildings in Spitak, heavily damaged Gyumri and Vanadzor Armenia's second and third largest cities.

  Killed ~25,000 people and displaced hundreds of thousands.

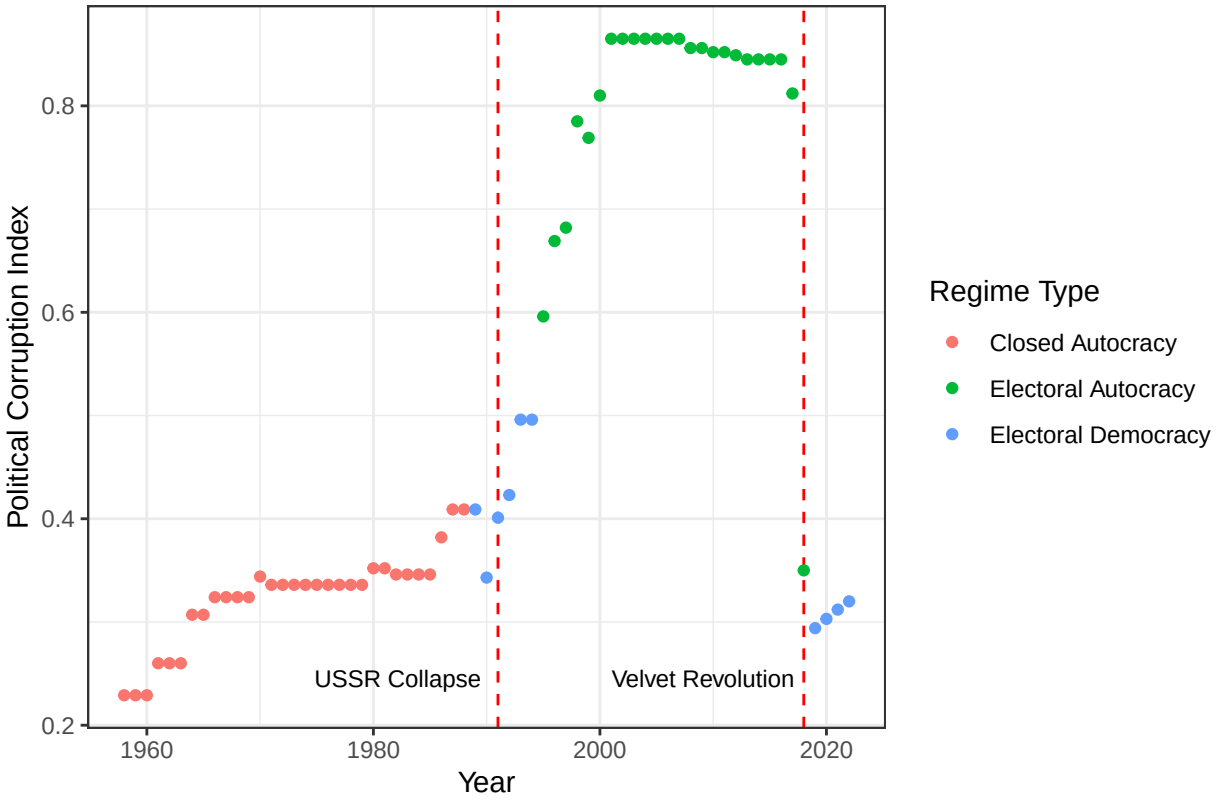
- Collapse of the Soviet Union (1991) triggered mass deindustrialization; urban jobs disappeared overnight. Resulted in urban depopulation as survival in rural areas became more viable than in cash-starved cities.

- First Nagorno-Karabakh War (1992–1994). Militarized much of the economy and society. Induced large-scale displacement of refugees, both ethnic Armenians from Azerbaijan and internally displaced people.

De-urbanization is rare globally. In most countries, urbanization is a one-way path. Armenia is an exception due to the overlapping disasters of earthquake, war, economic collapse, and emigration.

Beyond health and demographic outcomes, governance quality plays a crucial role in development. The following plot explores changes in Armenia's political corruption levels and regime type over time, with key events such as the Velvet Revolution marked for reference.

Figure 6: Political Corruption Index in Armenia (1958–2022)



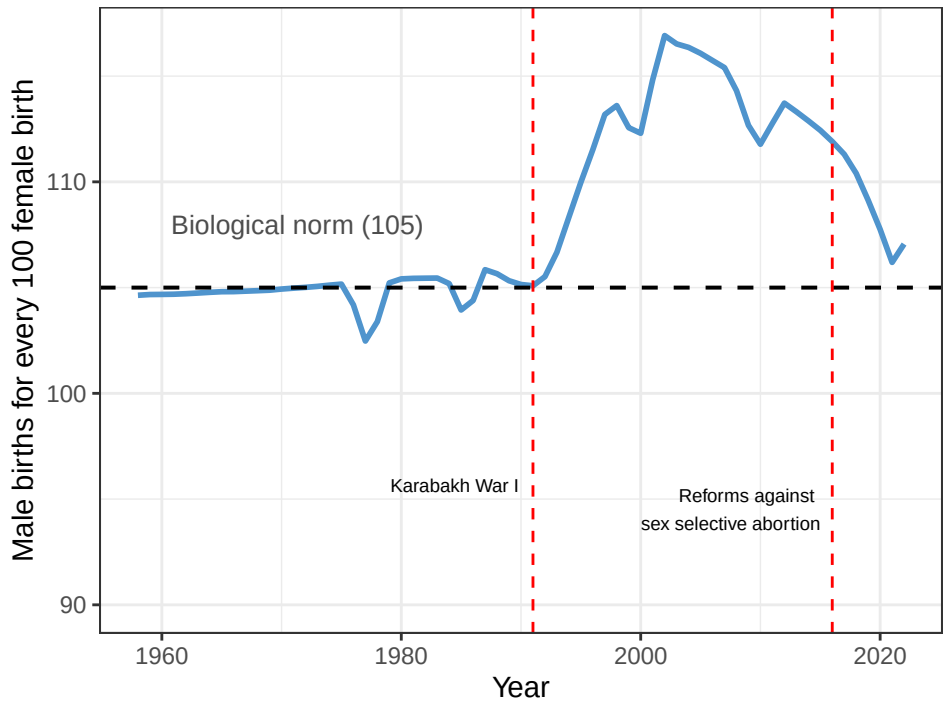
To see a definition of Corruption Index and Regyme Type, see Appendix A.

The above plot shows the corruption and regime dynamics in Armenia (1958–2022). At first glance, the relatively low corruption index during the Soviet period (1958–1991) might appear paradoxical, given that Armenia functioned under a closed autocratic regime. However, this observation aligns with broader patterns observed in centralized authoritarian systems, where the lack of transparency, limited press freedom, and absence of civil society mechanisms result in significant underreporting of corruption rather than its actual absence. Informal practices such as nepotism, clientelism, and personal networks were entrenched in Soviet governance structures, but rarely quantified or acknowledged officially (Ledeneva, 2006). With the onset of Perestroika and the political liberalization under Mikhail Gorbachev in the late 1980s, Armenia was nominally classified as an electoral democracy. This classification persisted into the early post-independence years following the USSR's dissolution in 1991. Nevertheless, by 1995, the regime type was reclassified by international indices (e.g., V-Dem, Freedom House) as an electoral autocracy, primarily due to repeated allegations of electoral manipulation, constrained media, and the consolidation of power among political elites. Correspondingly, Armenia's political corruption index began to surge, peaking around 2001, and remaining persistently high—above 0.85—throughout the 2000s and 2010s. A significant turning point occurred with the Velvet Revolution in 2018. Following this, Armenia's regime classification shifted back to electoral democracy, attributed to what international observers described as the first genuinely competitive elections in the country's post-Soviet history. In parallel, the corruption index underwent a sharp decline—

from over 0.8 to approximately 0.3 by 2022—suggesting tangible reductions in elite corruption, increased prosecutorial activity, and growing institutional responsiveness.

A more culturally sensitive indicator is the sex ratio at birth (SRB), which may reveal subtle forms of gender bias. In Armenia, this metric began to deviate from the biological norm in the 1990s, raising questions about the role of policy, tradition, and post-conflict militarization.

Figure 7: Distortion in Armenia's Sex Ratio at Birth (1958–2022)

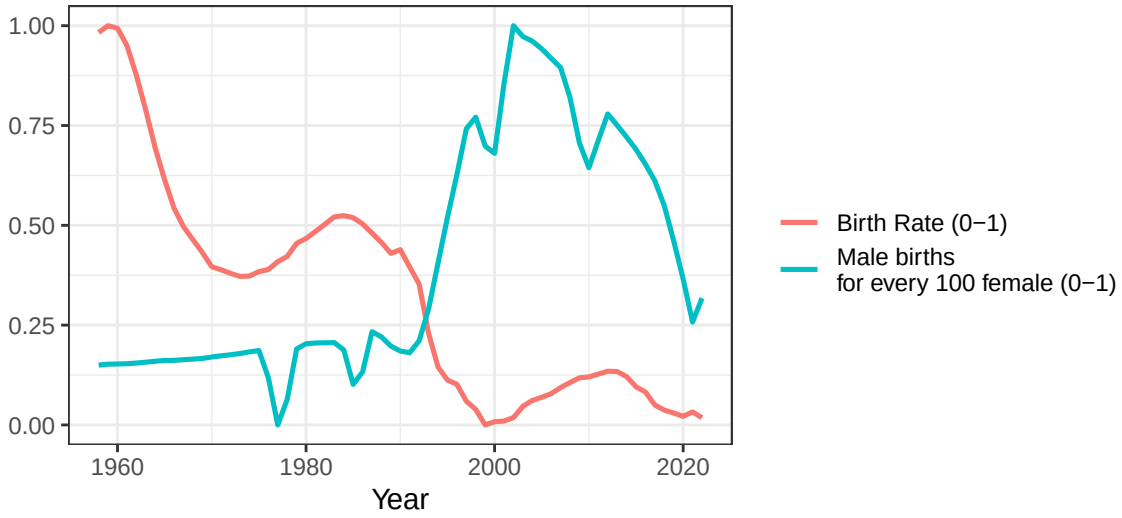


The plot above displays Armenia's sex ratio at birth (SRB)—defined as the number of male births per 100 female births—over time. While the biologically normative range for SRB is approximately 105 males per 100 females, Armenia exhibits a systematic deviation from this natural baseline, particularly after the early 1990s. The sharp rise in SRB coincides with the aftermath of the First Nagorno-Karabakh War (1988–1994) and Armenia's transition to independence in 1991. This distortion is attributed to sex-selective abortion, a phenomenon observed in several post-Soviet and East Asian contexts. In Armenia's case, the drivers are multifaceted: Sociocultural pressures, including strong son preference, rooted in patriarchal inheritance norms and expectations of sons to provide for parents in old age. Militarized nationalism, intensified by ongoing conflict with Azerbaijan, which ascribes male offspring as future soldiers and protectors of the homeland. The availability of prenatal sex-detection technologies, coupled with limited legal or regulatory frameworks during the early post-Soviet years, enabled the widespread use of sex-selective termination.

Beginning in 2016, the Armenian government implemented a legal ban specifically targeting sex-selective abortions, accompanied by public awareness campaigns and health sector guidelines aimed at addressing gender-biased reproductive choices. The data reflect a gradual normalization of the SRB in the years following the intervention. Nevertheless, the ratio remains elevated relative to the global norm, indicating persistent cultural and structural biases.

The continued imbalance carries long-term demographic and social risks, including gender imbalances in the adult population, skewed marriage markets, and potential increases in gender-based violence. Moreover, the systematic elimination of female fetuses, while not immediately apparent in demographic totals, may gradually suppress Armenia's population growth in the coming decades, as the future base of mothers shrinks, compounding the country's existing challenges of low fertility and emigration.

Figure 8: Normalized Birth Rate vs. Sex Ratio at Birth (0–1 scale)



This plot presents the normalized trends of Armenia's birth rate and sex ratio at birth (SRB) from 1958 to 2022. A clear inverse relationship emerges after the country's independence: as birth rates declined steadily, especially after the collapse of the USSR in 1991, the sex ratio at birth began to deviate from the natural norm. This distortion sharply increases in the mid-1990s and peaks around the early 2000s, corresponding with widespread use of sex-selective abortions.

The plot proves that the abnormal rise of male births does not coincide with a rise of birth rates, indicating an artificial factor's existence as the cause of the problem.

Conclusion

This report reveals Armenia's demographic and governance trends to be more resilient than commonly assumed. Despite experiencing one of the longest-running blockades in modern history, two wars, a devastating earthquake, and high emigration, Armenia's life expectancy trends mirror or surpass that of regional neighbors with ostensibly better geopolitical positioning. The country's inherited Soviet-era infrastructure, cultural prioritization of education and healthcare, and substantial diaspora support appear to have played key roles in mitigating full collapse. However, challenges remain: declining birth rates, persistent gender imbalances, and still high corruption rates suggest ongoing structural vulnerabilities.

References

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Appendix

Appendix A — Indicators and Definitions.

Life Expectancy: Average number of years a person is expected to live.

Urbanization Rate: % of population in areas defined as urban.

Corruption index: The Corruption Perceptions Index (CPI) is an index that scores and ranks countries by their perceived levels of public sector corruption, as assessed by experts and business executives. The CPI generally defines corruption as an "abuse of entrusted power for private gain".

Regime Types:

- In *closed autocracies*, citizens do not have the right to either choose the chief executive of the government or the legislature through multi-party elections.
- In *electoral autocracies*, citizens have the right to choose the chief executive and the legislature through multi-party elections; but they lack some freedoms, such as the freedoms of association or expression, that make the elections meaningful, free, and fair.
- In *electoral democracies*, citizens have the right to participate in meaningful, free and fair, and multi-party elections.
- In *liberal democracies*, citizens have further individual and minority rights, are equal before the law, and the actions of the executive are constrained by the legislative and the courts.

Appendix B — Major Events with Estimated Death Tolls and/or Explanaitions

Event	Year(s)	Estimated Deaths	Notes
Spitak Earthquake	1988	~25,000	Armenia's deadliest natural disaster. Caused major death and infrastructural damage.
First Karabakh War	1992-1994	~31,000. ~6000 from the Armenian side, ~25000 from the Azerbaijani side.	Ended in Armenian side's victory and control over Nagorno Karabakh. Had major demographic impact on Azerbaijan.
Georgian Civil War	1991-1993	~20,000	Resulted in near state collapse. Major impact on Georgian demographics.
Russo-Georgian War	2008	~850	Short but politically significant.
Karabakh War II	2020	~7,000*	Highly disruptive despite short duration.

* Important to note Azerbaijan's official death toll is being heavily scrutinized and is considered as untrustworthy