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## War, So Much War... Death, How Much Death: Two Years of Demographic Collapse in Gaza

**Enrique Acosta***'Ramón y Cajal' Research Fellow (CED-CERCA)***Diego Albrez-Gutierrez***Researcher Max Planck Institute for Demographic Research-MPIDR***Irena Chen***Researcher Max Planck Institute for Demographic Research-MPIDR***Ana C. Gómez-Ugarte***Researcher Max Planck Institute for Demographic Research-MPIDR*

Twenty-four months after the start of the war on the Gaza Strip, the enormity of the demographic fracture it has caused remains hidden behind a fog of statistics. In this number, a team of researchers from the Centre for Demographic Studies (CED) and the Max Planck Institute for Demographic Research (MPIDR) uses a Bayesian approach, to present an assessment that corrects the 40 % structural under-reporting in the official mortality statistics. The results show a demographic collapse that is unprecedented in recent history: a population decline of 10.6 % and a toll of more than 115,000 direct deaths, which is equivalent to the loss of 5 % of the initial resident population. Disaggregated by “war years”, the analysis captures the extreme intensity of the conflict. During the first year, risk of mortality increased 12.7 times and life expectancy plummeted to 29.5 years. In the second year, the risk was 7.4 times above the baseline and life expectancy stood at 40.4 years. In terms of survival levels, these figures represent a historic regression of a century, reverting to levels typifying the end of the Ottoman era. The structure of excess mortality confirms a pattern of transversal violence that systematically affects the non-combatant population in which children, women, and the elderly account for 57 % of victims in the first year, and more than 40 % in the second. This toll of direct violence is compounded by a sharp decline in the birthrate and a humanitarian and environmental crisis with lethal consequences that will continue to generate excess mortality long after any eventual ceasefire. Rigorously assessing the scale of this devastation is an essential ethical and scientific step in providing the foundations of evidence-based reparations processes.

## Overcoming the statistical fog of war: demographic analysis reveals extreme devastation

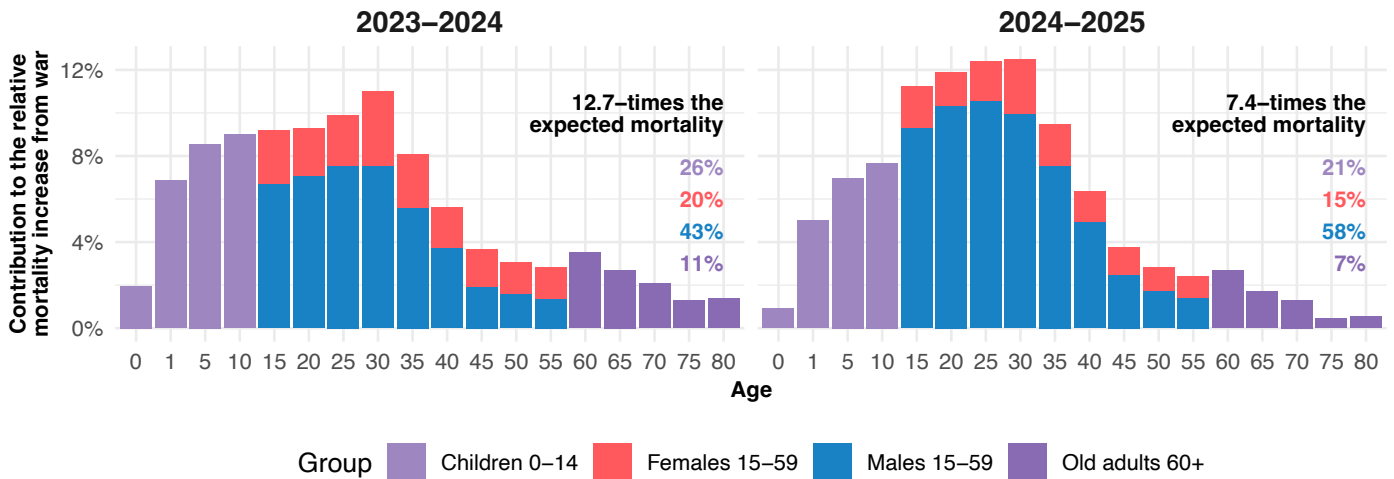
Demography has traditionally approached analysis of the impact of armed conflicts on populations from two perspectives: quantitative calculation of human costs represented by direct violent mortality, and study of indirect mortality together with effects on migration, fertility, and family structures. Contemporary approaches go beyond the traditional focus on a simple tally of victims. Today's demography seeks to gauge the magnitude and depth of the demographic rupture by analysing the reduction in longevity, loss of potential life due to premature death, and quantifying the magnitude of bereavement in the social structure of the survivors.

After two years of war on the Gaza Strip, the scale and speed of the observed mortality reflect extreme human devastation that has shattered people's life trajectories and irreversibly eroded kinship and care networks. Documenting this rupture with demographic rigour is an indispensable scientific imperative in any attempt to reveal the true extent of the damage and to guide reparation. However, measuring this devastation in the midst of an active crisis poses a major challenge: the destruction of critical infrastructure severely undermines the reliability of official records and obstructs the collection of traditional statistics.

On 6 October 2025, the Gaza Ministry of Health recorded 67,160 direct deaths, with demographic information available for almost 90 % of the victims. Nevertheless, the destruction of registration systems, the physical devastation, and the fact that thousands of bodies remain buried under rubble, suggest that these figures represent a mere fraction of the real impact in terms of the death toll.

In rectifying this limitation, independent research has turned to indirect estimation techniques. Studies applying capture-recapture methods that triangulate different sources of information (Jamaluddine et al., 2025) and conducting representative population surveys in the field (Spagat et al., 2026) are in agreement when they place structural under-reporting at around 40 % in official trauma mortality statistics.

Given this reality, our study introduces a methodological framework that explicitly links underreporting estimates with the demographic structure of the population at risk (Gómez-Ugarte et al., 2025). Instead of applying rigid correction factors,



**Figure 1.** Contribution to the relative mortality increase from conflict, by age and gender groups (Gaza, 2023-2025)

we developed a Bayesian approach that formally models the uncertainty of the primary sources, addressing both deficiencies in the overall coverage of the register and in the distribution of victims by sex and age. Unlike the original study by Gómez-Ugarte et al. (2025), which concluded its analysis in December 2024, this study analyses and corrects the official data series, extending it to October 2025, while assuming a structural gap of 40 %, in line with the sex and age structures quoted by Jamaluddine et al. (2025) and Spagat et al. (2026). Furthermore, the methodology incorporates forced migration to accurately recalculate the actual population that is exposed to risk, ensuring that measurement errors propagate in a mathematically consistent manner towards the final estimates of the cost in human lives.

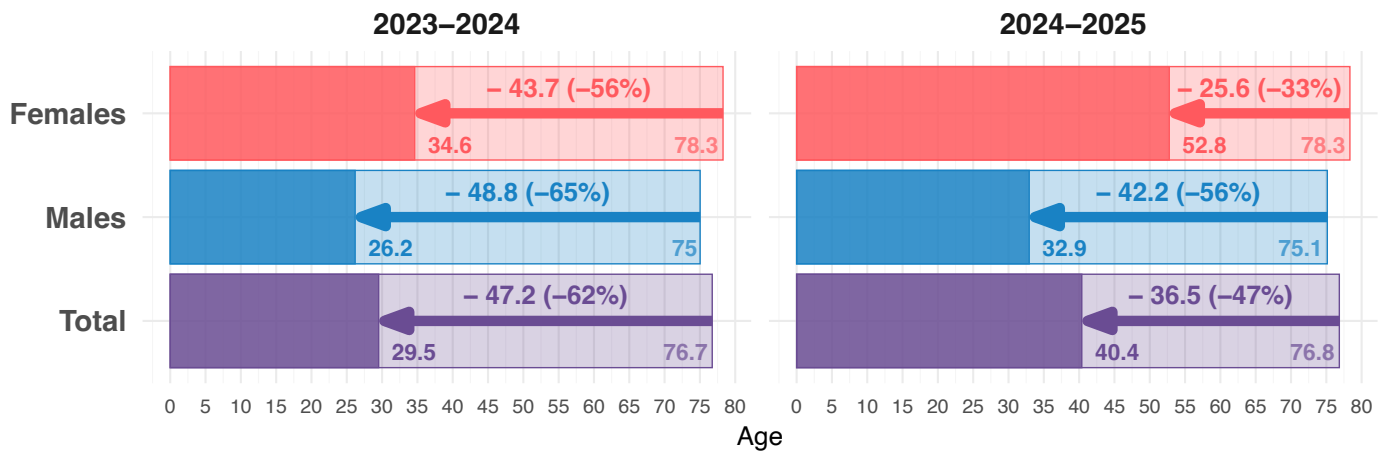
To capture variations in the intensity of violence and in living conditions, the time span was divided into two “war years”, the first from 7 October 2023 to 6 October 2024, and the second from 7 October 2024 to 6 October 2025. The impact of the crisis was assessed by comparing the observed indicators with a counterfactual scenario of expected mortality in the absence of conflict. By means of this comparison, the present study reports indicators of relative mortality increase, loss of life expectancy, and potential years of life lost, and offers a comprehensive view of the repercussions of the armed attack on the population.

## The chronic nature of extreme violence: persistence of demographic risk in the non-combatant population

In order to grasp the true scale of the demographic impact, it is necessary to situate the current violent excess mortality

on a historical continuum. Doing so brings out the fact that the chronic and latent violence of the occupation— characterised by a process of sustained structural attrition— shapes the previous state of thoroughgoing vulnerability upon which the present crisis of extremely acute violence unleashed since 2023 is having its effects. The Gaza strip has been under belligerent occupation since 1967, subject to a prolonged blockade since 2007, while about 70 % of the population has been living as refugees since before 2023. Following the drastic intensification of the offensive in 2023, the population of Gaza has suffered a process of war-induced, multifactorial demographic contraction. Estimates of the Palestinian Central Bureau of Statistics (PCBS) indicate that the Gaza Strip—with an initial population of approximately 2.1 million—has experienced a population decline of 10.6 % in just two years. This historic breakdown in demographic dynamics is the result of the combined effects of violent mortality, the forced migration of approximately 100,000 people, and a sharp decline in fertility rates due to malnutrition and the severe psychological trauma suffered by the population (PCBS, 2025; UNFPA, 2025).

In this situation of multidimensional crisis, our baseline estimate places direct deaths accumulated during the first two years of the war at more than 115,000 (with a range of uncertainty of 104,000 to 129,000 deaths). This volume of direct human loss alone is equivalent to the eradication of 5 % of the initial resident population at the start of hostilities. Temporal disaggregation of the analysis reveals the dynamics of the intensity of mortality risk. The first war-year (October 2023 – October 2024) was marked by extreme violence, which dramatically increased mortality to 12.7 times the level expected in the absence of war. The internal distribution of this excess mortality empirically confirms its cross-sectional nature: 57 % of violent deaths were



**Figure 2.** Decline in life expectancy at birth (e0) in the Gaza Strip as a result of the conflict (2023-2025)

concentrated among children under 15 years of age, women, and old adults aged over 60. This demographic profile breaks with the pattern of conventional conflicts, where excess mortality is usually concentrated among young male combatants. In Gaza, the violence is across the board. Large-scale bombardment of residential areas, and systemic destruction of vital infrastructure have a combined impact that results in an overall shift of the lethal risk to the non-combatant population (Figure 1).

During the second war-year (October 2024 – October 2025), the relative risk of death remained 7.4 times higher than the baseline. Despite the lowering of this risk multiplier, the proportion of deaths among the most vulnerable civilian groups remained at more than 40 % of the total recorded. Far from representing a window of recovery, the persistence of these levels confirms the chronic nature of a pattern of generalised extreme violence which perpetuates its direct impact on demographic segments that are theoretically unconnected with combat operations.

### Grief and destabilisation: the true costs of war beyond direct harm by weapons

The impact on life expectancy at birth reflects the dramatic decline in life expectancy at the populational level. In the first year of the war, it fell to 29.5 years (a drop of 60 % by comparison with the 77 years that were expected in the absence of conflict-related mortality) and, in the second year, to 40.4 years (a drop of 50 % – see Figure 2). These figures reveal an abrupt decline of exceptional magnitude in the period analysed. It should also be noted that, in this context, life expectancy measures the intensity of mortality

during the conflict and does not predict the longevity of survivors. Based on McCarthy’s historical reconstruction (2019), the probabilities of survival in the Gaza Strip during these two years have dropped to levels comparable with those of the Ottoman era or, in other words, a regression of more than a century.

By focusing exclusively on people who died as a direct result of the war, we find average ages at death of barely 26 for women and 28 for men which, in terms of demographic data, represents averages of 54 years of potential life lost for women and 49 years lost for men or, in other words, they lived only one third of what would be expected under ordinary conditions.

This enormity in terms of life trajectories that have thus been cut short go beyond the individual cost. Each death unleashes an “expanding wave of grief” that completely destabilises family and community surroundings. Carers are lost, family roles are forcibly redistributed—which increases the burden on critically vulnerable groups—all of which inflicts severe generational trauma that is difficult to remedy (Acosta et al., 2026; Alburez-Gutierrez et al., 2024).

### Anatomy of systemic damage and lethal inertia

This study demonstrates that demographic tools enable analysis of the impact of armed conflicts on populational survival rates, even in situations where data are incomplete or hotly disputed. A combination of indicators like excess mortality and loss of potential years of life allows measurement of the depth of the shock, which then reveals an irreparable fracture in the population’s biological and social potential.

This approach enables identification of the importance of indirect mortality and its delayed effects, while also



emphasising that the figures for direct violence represent a mere fraction of the reality against a background of systemic breakdown which is marked by erosion of care networks due to loss of family members, forced displacement of more than 90 % of the population, environmental degradation, and almost total destruction of civilian infrastructure and housing (OCHA, 2026; UNEP, 2025). This situation has led an independent commission of the United Nations General Assembly (2025) to classify the war on Gaza as genocide, highlighting the exceptional nature of the circumstances documented here.

Taken together, these factors constitute a lethal momentum that will keep driving up the number of victims long after hostilities have ended. Quantifying this toll poses a major challenge for demographic research. Measurement of the process is highly complex owing to the latency of food insecurity and collapse of the healthcare system which, unlike traumatic violence, take long periods to become manifest as observable deaths. Demographic strategies

capable of capturing these delayed processes are essential if underestimation of total consequences is to be avoided. Within this framework, key findings which suggest that indirect mortality could increase the number of direct deaths by around another 10 % (Spagat et al., 2026) should be interpreted as a lower limit that is subject to revision as this systemic crisis fully unfolds over time.

Quantifying this shock with demographic rigour provides an indispensable empirical foundation for confronting the normalisation of violence by offering the structural evidence that must complement human testimonies and legal processes of reparation. The indicators thus provided should supplement a research agenda that addresses social dislocation and the impact on mental health of a population subjected to a whole range of generational trauma, in order to adequately respond to the ethical imperative of documenting the crisis and contributing to processes of reparation based on sound evidence.

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### Editors

Andreu Domingo and Albert Esteve

### Correspondence to

Enrique Acosta  
eacosta@ced.uab.cat

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@CEDemografia

### LinkedIn

<https://www.linkedin.com/company/centre-estudis-demografics/>

### Contact

Centre d'Estudis Demogràfics  
Calle de Ca n'Altayó, Edifici E2  
Universitat Autònoma de Barcelona  
08193 Bellaterra / Barcelona  
Spain  
+34 93 5813060  
demog@ced.uab.cat  
<https://ced.cat/eng>