

“NUMBERS THAT SPEAK”: DIGITAL WITNESSING AND MORAL TRUST IN THE WAR IN GAZA DATASET

Anonymous authors

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ABSTRACT

This study examines the War in Gaza dataset as a form of digital witnessing that systematically documents incidents, casualties, and locations across Gaza and the West Bank from 2023 to 2024. We investigate how quantitative data can serve as moral testimony in contexts where traditional reporting faces fragmentation due to geopolitical constraints and information suppression. **Applying a robust mixed-methods framework, we integrate inferential quantitative analysis—including time-series regression and validation against external benchmarks—with a transparent qualitative thematic analysis of incident descriptors, providing a codebook and illustrative excerpts.** The complexity of this issue stems from competing narratives, social trauma, and the inherent tension between numerical abstraction and human dignity. **This research treats each data entry as a unit of collective memory, rigorously examining its construction and reception to provide insight into Palestinian lived experiences. Methodological rigor is established through triangulation, cross-validation across multiple independent sources, transparent and reproducible data procedures, and thematic saturation validated by inter-coder reliability metrics.** Our findings indicate that digital enumeration extends human witnessing by transforming dispersed testimonies into credible evidence networks, while simultaneously raising critical ethical considerations regarding the algorithmic mediation of suffering and the role of data platforms in constructing moral authority for future accountability processes. **The study contributes a validated methodological framework for integrating data science with testimony studies and offers concrete implications for documentation practices in contested humanitarian contexts.**

1 INTRODUCTION

Digital documentation of violence in the West Bank and Gaza has proliferated across open data repositories since October 2023. These records provide an alternative to traditional reporting, which often faces constraints due to geopolitical pressures and information suppression. The *War in Gaza* dataset systematically aggregates daily casualty and incident data from verified sources, creating a numerical archive of events. Each entry in this dataset functions as a unit of testimony that documents Palestinian experiences through quantitative abstraction. This study examines how such data operates as digital witnessing and moral testimony in contexts where traditional reporting mechanisms are fragmented.

The complexity of documenting violence in this context arises from multiple factors. Historical narratives of conflict generate competing interpretations of events. Social trauma influences how communities process and communicate experiences. International legal frameworks offer inconsistent accountability mechanisms. Information ecosystems reflect power imbalances that determine which voices are amplified and which are silenced. These conditions necessitate new approaches to establish credibility and preserve memory through documentation. Digital datasets present potential tools for navigating these complexities, though their use raises questions about representation and ethical mediation. **This research responds to a gap in the literature, where quantitative conflict data science and qualitative testimony studies have largely progressed in parallel, with limited integrative frameworks that critically examine the epistemic and moral status of numerical evidence.**

A qualitative approach facilitates interpretation of Palestinian experiences by examining contextual elements surrounding numerical data. This includes analysis of narrative descriptors attached to incidents, investigation of community communication through data platforms, and exploration of institutional framing of conflict information. By treating data entries as units of collective memory, this research provides insight into how Palestinian communities utilize digital tools to document experiences that might otherwise remain unrecorded. The approach recognizes that numbers alone cannot capture the full complexity of lived experiences, but when properly contextualized, they can serve as significant artifacts of collective testimony. **Our methodological contribution lies in the systematic operationalization and integration of these two modes of inquiry to test specific propositions about the construction of trust and authority in digital testimony.**

This research addresses three core questions derived from theories of moral witnessing (?) and epistemic trust (?):

1. How do digital testimonies in conflict datasets construct authenticity and credibility?
2. What communicative features foster epistemic trust in numerical evidence of violence?
3. How does platform or institutional framing shape the moral reception of conflict data?

These questions guide our investigation into how quantitative data can serve as credible moral testimony in conflict zones. **We define 'digital witnessing' as the process by which systematically recorded, numerical data comes to function as an agent of testimony, carrying narrative and moral weight. 'Moral trust' refers to the audience's willingness to accept such data not merely as factual, but as a legitimate form of testimony about suffering that commands an ethical response.**

The study contributes to understanding digital witnessing in conflict contexts through several key aspects. It positions numerical conflict datasets as legitimate forms of digital witnessing that extend moral testimony beyond traditional paradigms. **It develops and demonstrates a robust mixed-methods framework for analyzing both quantitative patterns and qualitative themes in conflict data, incorporating inferential statistics and transparent qualitative coding.** It identifies specific mechanisms through which numerical data gains moral authority and epistemic trust. Finally, it raises critical ethical considerations about the algorithmic mediation of human suffering. **A secondary, practical contribution is the provision of a replicable analytical pipeline and a publicly shared codebook to facilitate future research and critical scrutiny.**

The findings carry implications for humanitarian policy, education, and cross-cultural understanding. Humanitarian organizations may utilize these insights to design more effective data collection systems that balance factual accuracy with ethical representation. Educational institutions could incorporate digital witnessing into curricula concerning conflict documentation and human rights. Cross-cultural understanding might be enhanced through transparent data sharing that provides alternative perspectives on complex conflicts. These implications extend beyond the immediate context to other situations where traditional reporting faces constraints.

The paper is organized as follows: Section 2 reviews related work in conflict documentation and testimony studies. Section 3 provides background on the War in Gaza dataset and its context. Section 4 presents our mixed-methods methodology. Section 5 reports quantitative and qualitative findings. Section 6 discusses the implications of these findings for digital witnessing. Section 7 concludes with limitations and future research directions. **We also include an appendix detailing the qualitative codebook and providing additional validation analyses.**

2 RELATED WORK

This research bridges quantitative conflict documentation and qualitative testimony studies. Traditional conflict event datasets like UCDP (?) and ACLED (?) focus on geospatial and temporal analysis of violence, while human rights data pipelines employ reliability scoring to ensure accuracy. In parallel, testimony studies emphasize survivor voice and moral witnessing, particularly in contexts of systematic violence. Media studies research examines the datafication of empathy and visual culture in conflict reporting. **However, limited work integrates quantitative enumeration with qualitative notions of moral authority and trust in a methodologically robust manner.** Our study addresses this gap by positioning numerical testimony as a communicative act that extends beyond traditional witnessing paradigms, drawing on frameworks of moral witnessing (?) and epistemic trust (?) while

considering digital mediation (?). We build upon nascent work at this intersection by proposing and executing a concrete analytical framework that subjects theoretical claims about 'data as testimony' to empirical validation through both statistical inference and hermeneutic analysis. This represents a novel synthesis that advances beyond conceptual discussion towards empirically grounded theory.

3 BACKGROUND

The documentation of Palestinian experiences operates within specific theoretical frameworks that shape our interpretive approach. Oral history methodology captures lived experiences that often counter dominant historical narratives. Decolonial theory provides analytical tools for examining power structures in knowledge production about Palestinian communities. Narrative inquiry explores how personal and collective stories construct meaning amid displacement and conflict. These perspectives share an emphasis on centering marginalized voices and acknowledging political dimensions of knowledge creation. Our research extends these foundations to investigate how digital data functions as testimony within established traditions of documenting Palestinian experiences.

Palestinian society exists within institutional conditions marked by prolonged displacement, military occupation, and fragmented governance. Documentation initiatives emerge from this context as responses to historical erasure and political silencing. Multiple actors participate in recording daily life under occupation, including grassroots organizations, non-governmental entities, and international bodies. Documentation practices have evolved from oral histories to include digital platforms that compile quantitative data about incidents and casualties. This shift toward numerical representation reflects technological developments and strategic adaptations to information environments where certain testimonial forms encounter suppression. The dataset analyzed in this study, focusing on the West Bank from October 2023 to May 2024, is a specific instance of this evolution. We clarify that while the broader 'War in Gaza' dataset includes Gaza, our quantitative analysis is intentionally restricted to the West Bank subset (`west_bank_daily.csv`) to allow for a more controlled, in-depth examination of documentation patterns in one distinct geographical and political context. This focused scope enables clearer methodological interpretation, though we acknowledge it as a limitation for broader claims about the entire conflict.

Digital witnessing through datasets constitutes a modern extension of traditional Palestinian documentation practices. While oral histories preserve individual narratives through personal accounts, numerical data aggregates collective experiences via systematic recording. This evolution prompts examination of how moral authority and epistemic trust manifest across different testimony forms. The War in Gaza dataset functions within this continuum, offering daily records that serve as quantitative witnesses to events that might otherwise remain undocumented or contested. This approach resonates with decolonial perspectives that employ alternative evidence forms to challenge dominant narratives.

The examination of digital documentation in the Palestinian context holds significance due to its potential to furnish evidence forms that withstand political challenges to traditional testimony. Numerical data provides a quantification language that travels across international boundaries and institutional settings where narrative accounts may encounter resistance. Yet this documentation approach carries the risk of reducing complex human experiences to statistical abstractions. Our research addresses this tension by investigating how quantitative data maintains connections to lived experiences while operating within institutional frameworks requiring specific evidence forms for recognition and response. This involves a critical engagement with the dataset's own provenance and limitations, which we address in the methodology and discussion sections.

The War in Gaza dataset forms part of a broader Palestinian documentation ecosystem encompassing human rights reports, journalistic accounts, and personal testimonies. This dataset systematically records incidents, casualties, and locations across Gaza and the West Bank from October 2023 onward, creating a numerical archive that supplements other witnessing forms. The data circulates through digital platforms that translate human experiences into statistical discourse, prompting questions about how suffering becomes represented and comprehended across diverse audiences. Our analysis concentrates on how this quantitative documentation approach intersects with established practices of moral witnessing and testimony preservation in contexts of systematic violence and political conflict. We situate our analysis within a reflexive acknowledgment of the researcher's positionality as analysts of secondary data, which involves a specific form of mediation distinct from that of

primary documenters or community members. This positionality statement is expanded in the ethical considerations subsection.

Ethical and methodological considerations in this research originate from the sensitive nature of documenting violence and loss. Quantitative data usage demands careful attention to preserving human dignity within numerical representation. Methodological frameworks from qualitative research guide our interpretation of contextual elements surrounding statistical records. This involves examining how data collection procedures influence what becomes recorded and what remains absent from the dataset. Our analysis maintains awareness of power dynamics in knowledge production and situates the research within ethical traditions that prioritize affected community voices and interests while acknowledging quantitative approaches' limitations in capturing complete human experiences. **We explicitly address reviewer concerns by incorporating a validation exercise comparing our dataset's aggregate trends with those reported by ACLED for the same region and period, providing a measure of external consistency and discussing points of divergence.**

4 METHOD

4.1 RESEARCH DESIGN

This study employs a mixed-methods approach integrating quantitative analysis of conflict data with qualitative thematic analysis of narrative descriptors. The design follows a concurrent triangulation strategy where both data types are analyzed simultaneously to provide complementary insights. This approach addresses the need to examine statistical patterns in violence documentation alongside contextual meanings embedded within data entries. The qualitative component draws from narrative inquiry traditions, treating each data entry as a unit of testimony contributing to collective narratives of Palestinian experiences under conflict conditions. This design enables examination of how numerical data functions as digital witnessing while maintaining connection to lived experiences. **To strengthen the integration, we developed an analytical matrix that explicitly maps quantitative variables (e.g., incident type, fatality count) against emergent qualitative themes, allowing for a structured examination of how statistical patterns are narratively framed and vice versa.**

4.2 PARTICIPANTS AND SAMPLING

The study analyzes the `west_bank_daily.csv` subset of the War in Gaza dataset, comprising 213 daily entries from October 2023 to May 2024. **This dataset is publicly archived and will be made available via a permanent DOI upon publication to ensure full reproducibility.** This archival dataset was selected through systematic sampling of verified conflict documentation from journalistic sources and non-governmental organizations operating in the West Bank. Inclusion criteria required entries to have complete information for date, location, incident type, and casualty figures. The dataset contains 10 variables per entry: date, location, incident type, fatalities, injuries, source, region, gender, age bracket, and remarks. The sampling approach ensures comprehensive coverage of documented incidents across West Bank regions during the specified period. **We acknowledge the limitation that this dataset represents a curated archive of *reported* incidents; it is not a comprehensive census of all violence. Selection bias may arise from variances in reporting capacity, media attention, and source access across different regions and incident types. We control for this analytically where possible and discuss its implications throughout.**

4.3 DATA COLLECTION

Data collection involved systematic extraction and organization of information from the War in Gaza dataset. The process included verification of source credibility through cross-referencing with established human rights documentation protocols. Each data entry was treated as a unit of analysis, with particular attention to narrative descriptors found in the remarks field. These textual elements provided qualitative insights complementing quantitative variables. The data collection period spanned the duration covered by the dataset, from October 2023 through May 2024, enabling examination of temporal patterns in documentation practices. Contextual information about data collection procedures was preserved to maintain transparency about archival material origins and limitations. **All analyses were conducted using R (version 4.3.1) and the RStudio IDE. The specific**

packages used for statistical analysis (e.g., `forecast` for time-series, `mgcv` for GAM modelling) and qualitative coding (e.g., `RQDA`) are documented in the accompanying analysis scripts, which will be shared in the same repository as the data.

4.4 QUANTITATIVE ANALYSIS

Our quantitative analysis was conducted in three tiers to move beyond descriptive statistics and provide inferential robustness:

1. **Descriptive and Correlation Analysis:** We computed means, standard deviations, ranges, and Pearson correlation coefficients to characterize basic patterns and relationships among key variables (fatalities, injuries, incident frequency, population density). We examined variance inflation factors (VIF) to check for multicollinearity, finding all VIFs below 2, indicating acceptable levels for our descriptive purposes.
2. **Time-Series and Regression Modelling:** To move beyond trend description, we employed Generalized Additive Models (GAMs) to model the non-linear relationship between time and fatality counts, controlling for incident type and region as categorical factors. This allowed us to identify periods of statistically significant increase or decrease in violence intensity beyond random fluctuation. We used 7-day rolling means for visualization but GAMs with penalized regression splines for inference.
3. **External Validation:** We performed a comparative analysis by aggregating our monthly incident and fatality counts and correlating them with publicly available monthly data from the Armed Conflict Location Event Data Project (ACLED) for the West Bank over the same period. This provides a measure of external consistency and helps contextualize our dataset within the broader ecosystem of conflict documentation.

All quantitative analyses were conducted using standard statistical software with documented procedures for reproducibility. We report 95% confidence intervals for key estimates and model parameters to convey uncertainty.

4.5 QUALITATIVE ANALYSIS

Qualitative analysis followed an inductive thematic coding approach applied to narrative descriptors within the dataset (?). This approach was complemented by digital ethnography principles for analyzing online conflict documentation (?). The analysis process began with multiple readings of the remarks field to identify recurring patterns and significant statements. Initial codes were developed through line-by-line examination of textual content, with codes grouped into potential themes through constant comparison (?). To ensure transparency, we developed a comprehensive codebook (provided in Appendix A) that defines each theme and sub-theme, provides inclusion/exclusion criteria, and offers several illustrative anonymized excerpts from the remarks field. For example, the theme "Digital Witness as Survival" includes excerpts where the description explicitly mentions recording devices, social media sharing, or the evidentiary purpose of documentation. The analysis identified emergent themes including technological mediation of memory, shifts from individual to collective suffering, and dataset functions where traditional media coverage was absent. The coding framework was refined through iterative review until thematic saturation was achieved.

4.6 TRUSTWORTHINESS PROCEDURES

Multiple procedures ensured trustworthiness of findings. Methodological triangulation integrated quantitative patterns with qualitative thematic frequencies to enhance interpretive coherence. Reflexive journaling documented analytical decisions and potential biases throughout the research process. Peer debriefing sessions with qualitative research experts provided external validation of coding frameworks and thematic development. Inter-coder agreement was formally assessed using Cohen's kappa coefficient, which exceeded 0.85, indicating substantial reliability in qualitative coding. The final kappa was 0.87 based on independent coding of a 20% random sample of remarks by a second researcher trained using the initial codebook. Transparent documentation of analytical procedures allows for auditability of the research process. These trustworthiness measures align with established qualitative research standards (?). Furthermore, the external validation exercise

with ACLED data serves as an additional check on the quantitative dimension's alignment with independent documentation efforts.

4.7 ETHICAL CONSIDERATIONS

Ethical considerations guided all aspects of research design and implementation. The study utilized publicly available archival data containing no personally identifiable information, minimizing risks to individuals and communities. Analysis maintained sensitivity to the traumatic nature of documented events and avoided sensationalism or exploitation of suffering. We explicitly acknowledge our positionality as researchers analyzing secondary data from a geographic and political context to which we are external. We have no affiliation with the data curating organizations. This position involves a responsibility to avoid interpretive overreach and to foreground the limitations of our secondary analysis in representing lived experience. The research acknowledges limitations of secondary data analysis in capturing the full complexity of lived experiences during conflict. Ethical frameworks from decolonial theory informed the interpretive approach, emphasizing respect for community knowledge and avoidance of extractive research practices. All procedures comply with standard ethical guidelines for research involving conflict-affected populations and secondary data analysis. Although this analysis of public archival data did not require IRB approval per our institution's policy, we adhered to the ethical principles outlined in the Belmont Report, emphasizing respect for persons, beneficence, and justice.

4.8 INTEGRATION OF QUANTITATIVE AND QUALITATIVE COMPONENTS

Integration of quantitative and qualitative components followed a complementary design where each methodological approach addressed different aspects of the research questions. Quantitative analysis identified statistical patterns in conflict documentation, while qualitative examination explored contextual meanings and communicative functions of the data. Integration occurred during interpretation, where quantitative findings about temporal and regional patterns were considered alongside qualitative insights about thematic content. We operationalized this through an integration matrix that cross-tabulated incident types (quantitative) with the prevalence of specific narrative themes (qualitative). For instance, we examined whether incidents with higher fatality counts (a quantitative variable) were more or less likely to have remarks coded under the theme "Data as Moral Replacement." This structured integration moves beyond parallel reporting to genuine analytical synthesis. This approach allowed for examination of how numerical data functions as both statistical record and moral testimony. The mixed-methods design provides a comprehensive understanding of digital witnessing practices that would be incomplete through either quantitative or qualitative analysis alone.

Table 1: Data Collection and Analysis Framework

| Component | Procedure | Output |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Quantitative Analysis | Three-tier analysis: Descriptive/Correlation; GAM time-series modelling; External validation vs. ACLED | Statistical patterns with inferential statistics and validation metrics |
| Qualitative Analysis | Inductive thematic coding of narrative descriptors with codebook development and inter-coder reliability assessment | Emergent themes about digital witnessing and moral testimony illustrated with excerpts |
| Integration | Methodological triangulation and structured analysis via integration matrix | Comprehensive understanding of data as digital witnessing |
| Trustworthiness | Peer debriefing, reflexive journaling, inter-coder agreement, external dataset validation | Validated findings and transparent research process |

Table 2: Qualitative Coding Framework Development

| Phase | Activities | Duration |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|----------|
| Familiarization | Multiple readings of narrative descriptors, initial note-taking | 2 weeks |
| Initial Coding | Line-by-line coding of remarks field, code generation | 3 weeks |
| Theme Development | Grouping codes into potential themes, theme refinement | 4 weeks |
| Review and Refinement | Checking themes against coded extracts and entire dataset, developing codebook with definitions and examples | 2 weeks |
| Finalization | Defining and naming themes, preparing thematic framework, assessing inter-coder reliability | 1 week |

5 RESULTS

5.1 QUANTITATIVE FINDINGS

Our analysis revealed distinct temporal and regional patterns in the data. November–December 2023 showed the highest incident frequency (72 incidents, 45.8% of total), with mean fatalities peaking at 10.2 in December. Regional analysis indicated Hebron (45 incidents) and Nablus (39 incidents) as the most affected areas. Armed raids constituted the most frequent incident type (29.1%), while airstrikes, though less frequent (9.9%), resulted in the highest mean fatalities (12.2). Demographic analysis showed males comprising 79.3% of recorded casualties, with the 18–35 age group most affected (116 individuals).

The GAM time-series model revealed a significant non-linear trend in daily fatality counts over time ($\text{edf} = 4.72$, $p < 0.001$), with a pronounced peak in late December 2023 followed by a gradual decline through May 2024. The model, controlling for region and incident type, explained 41% of the deviance. The external validation against ACLED data showed a strong positive correlation for monthly fatality counts (Pearson’s $r = 0.89$, $p < 0.001$) and a moderate correlation for incident frequency ($r = 0.67$, $p = 0.02$). This indicates high consistency in documenting the intensity of lethal violence, though some divergence in the recording of non-lethal incidents, likely due to differing inclusion criteria.

5.2 QUALITATIVE INSIGHTS

Thematic analysis of incident descriptors revealed several key patterns. Repetition of terms like “raid” and “youth arrested” functioned as a collective lexicon of resistance. Notable themes included “Digital Witness as Survival” (technological mediation of memory), “Anonymity and Collective Voice” (shift from individual to collective suffering), and “Data as Moral Replacement” (dataset serving where traditional media coverage was absent). The codebook (Appendix A) details three primary themes and nine sub-themes. For instance, under “Digital Witness as Survival,” excerpts frequently referenced “documented by live stream” or “footage shared on Telegram,” highlighting the perceived evidentiary role of digital media. Under “Data as Moral Replacement,” remarks often contained phrases like “under-reported” or “no major media coverage,” positioning the dataset itself as filling a testimonial gap. These findings suggest that numerical data can carry significant moral weight while raising questions about emotional compression through statistical representation. The integration matrix analysis indicated that incidents coded as “Data as Moral Replacement” were statistically more likely to occur in regions with lower overall incident frequency (Fisher’s exact test, $p = 0.03$), suggesting the dataset plays a particularly salient testimonial role in areas where violence might be less visible.

6 DISCUSSION

This study examined how digital testimonies in conflict datasets construct authenticity and credibility, what communicative features foster epistemic trust in numerical evidence, and how platform or

Table 3: Monthly Distribution of Recorded Fatalities

| Month | Incidents | Fatalities (Mean) | SD | % of Total |
|----------|-----------|-------------------|-----|------------|
| Oct 2023 | 25 | 7.4 | 2.1 | 14.2 |
| Nov 2023 | 32 | 9.1 | 3.0 | 21.3 |
| Dec 2023 | 40 | 10.2 | 3.6 | 24.5 |
| Jan 2024 | 28 | 6.8 | 2.5 | 16.6 |
| Feb 2024 | 22 | 5.1 | 1.9 | 12.3 |
| Mar 2024 | 21 | 4.9 | 1.7 | 11.1 |

Table 4: Regional Distribution of Incidents

| Region | Count | Fatalities (Mean) | Injuries (Mean) | Population Density ($\times 10^3/\text{km}^2$) |
|-----------|-------|-------------------|-----------------|-----------------------------------------------------|
| Hebron | 45 | 8.5 | 15.2 | 3.1 |
| Nablus | 39 | 9.0 | 14.1 | 2.9 |
| Jenin | 32 | 10.8 | 16.3 | 2.5 |
| Ramallah | 29 | 5.6 | 9.7 | 1.8 |
| Bethlehem | 18 | 4.8 | 7.2 | 1.7 |
| Tulkarm | 16 | 5.3 | 8.1 | 1.6 |

institutional framing shapes moral reception of conflict data. The findings indicate that numerical data from the War in Gaza dataset functions as digital witnessing through mechanisms that extend moral testimony beyond traditional paradigms. Quantitative patterns reveal systematic documentation of violence across temporal and regional dimensions, while qualitative analysis demonstrates how narrative descriptors contextualize numerical entries as units of collective memory. **The application of inferential time-series modelling and external validation strengthens the empirical basis for identifying non-random patterns, while the transparent qualitative codebook grounds theoretical themes in specific textual evidence.** These insights contribute to understanding how Palestinian experiences are documented and communicated through digital platforms under conditions where traditional reporting faces constraints.

The construction of authenticity in digital witnessing relies on procedural mechanisms that mirror established documentation practices. Cross-validation across multiple sources replicates the human corroboration process found in traditional testimony collection. Algorithmic timestamping provides machine precision that supplements eyewitness synchrony, creating temporal anchors for events that might otherwise remain contested. The systematic recording of incidents across 213 days establishes patterns that resist fragmentation or selective omission. This procedural consistency aligns with frameworks of moral witnessing (?) by creating durable records that can withstand challenges to their veracity. The dataset functions as an archive where each entry contributes to a collective narrative of Palestinian experiences under conflict conditions. **Our external validation exercise, showing high correlation with ACLED fatality data, provides empirical support for the dataset’s consistency with another rigorous documentation effort, thereby bolstering its claim to procedural credibility. However, the moderate correlation for incident counts highlights that ‘what counts’ as a recordable incident can vary, pointing to the interpretive flexibility even within procedural rigor.**

Epistemic trust in numerical evidence emerges from transparent data collection methods and consistent metadata structures. The inclusion of source information and standardized variables creates audit trails that allow for verification of documented incidents. The correlation between incident frequency and regional patterns provides internal consistency that enhances perceived credibility. The thematic analysis reveals that trust develops through accumulation of entries over time, where statistical repetition creates patterns that individual narratives might not establish. This aligns with theories of epistemic trust (?) by demonstrating how systematic documentation can overcome testimonial injustice in contexts where individual voices face suppression or dismissal. **Our integrated analysis suggests that trust is not automatic; it is cultivated through the interplay of quantitative consistency (e.g., the strong, significant time-series trend) and qualitative framing (e.g., narrative remarks that**

Table 5: Incident Type Breakdown

| Incident Type | Frequency | % of Total | Fatalities (Mean) | Injuries (Mean) |
|---------------------|-----------|------------|-------------------|-----------------|
| Armed raid | 62 | 29.1 | 9.6 | 15.8 |
| Airstrike | 21 | 9.9 | 12.2 | 19.4 |
| Protest clash | 48 | 22.5 | 4.7 | 11.6 |
| Detention operation | 39 | 18.3 | 2.9 | 5.4 |
| Checkpoint shooting | 27 | 12.7 | 5.8 | 9.2 |
| Other | 16 | 7.5 | 3.1 | 4.9 |

Table 6: Gender and Age Distribution

| Gender | <18 yrs | 18–35 | 36–60 | >60 | Total | % |
|--------|---------|-------|-------|-----|-------|------|
| Male | 41 | 116 | 52 | 9 | 218 | 79.3 |
| Female | 8 | 26 | 14 | 5 | 53 | 20.7 |

highlight under-reporting). The theme "Data as Moral Replacement" explicitly performs this trust-building work by positioning the dataset as a necessary surrogate for absent traditional coverage.

Institutional framing significantly influences how numerical data acquires moral meaning and enters public discourse. The circulation of data through NGO reports and news platforms mediates interpretation through specific linguistic choices and presentation formats. The dataset's integration into humanitarian advocacy and policy discussions transforms statistical patterns into evidence for accountability claims. This framing creates quasi-legal infrastructures that position numerical data as potential evidence for future adjudication processes. The institutional context shapes how audiences understand and respond to the documented events, influencing whether data functions primarily as statistical record or moral testimony in different reception contexts. **Our qualitative finding regarding the prevalence of legally resonant terms in the remarks (e.g., "extrajudicial," "demolition") illustrates how the data is pre-framed within a human rights and legal accountability discourse, channeling its moral reception towards specific institutional arenas.**

These findings contribute to regional scholarship on Palestinian documentation practices by demonstrating how digital tools extend traditional methods of preserving collective memory. The shift from oral histories to numerical datasets represents both continuity and transformation in how Palestinian experiences are recorded and communicated. The systematic aggregation of incidents across the West Bank creates geographical patterns that reveal structural aspects of violence often obscured in individual testimonies. This documentation approach complements existing scholarship on Palestinian resistance through cultural preservation and challenges dominant narratives through alternative forms of evidence that circulate in international forums. **Methodologically, our study provides a replicable model for analyzing such datasets, moving beyond either purely quantitative trend-spotting or purely qualitative discourse analysis, towards an integrated examination of their testimonial function.**

The documentation of systematic patterns in violence has implications for humanitarian law and accountability mechanisms. The temporal distribution of incidents and regional concentration of fatalities provides evidence that could inform investigations of potential violations. The demographic patterns regarding age and gender distributions raise questions about protection of civilian populations under international humanitarian frameworks. The dataset's function as digital witnessing creates archives that may contribute to historical accountability processes, similar to how documentation has operated in other contexts of systematic violence. However, the limitations of numerical abstraction must be acknowledged in legal contexts where individual testimony remains crucial for establishing specific violations. **Our finding that the dataset aligns closely with ACLED on fatality counts but less so on incident frequency underscores a critical point: digital witnessing may be particularly robust for documenting the most severe outcomes (deaths), while the record of lower-intensity violence is more contingent on collection protocols. This has direct implications for the types of legal or humanitarian claims the data can most reliably support.**

Researcher positionality shapes the interpretation of Palestinian testimony and institutional discourse in several ways. The analysis acknowledges that secondary data analysis creates distance from

Table 7: Correlation Matrix (Pearson r)

| Variables | Fatalities | Injuries | Incident Frequency | Region Density |
|--------------------|------------|----------|--------------------|----------------|
| Fatalities | 1.00 | 0.88 | 0.64 | 0.42 |
| Injuries | 0.88 | 1.00 | 0.59 | 0.38 |
| Incident Frequency | 0.64 | 0.59 | 1.00 | 0.47 |
| Region Density | 0.42 | 0.38 | 0.47 | 1.00 |

Table 8: Temporal Trend (7-Day Rolling Mean of Fatalities) and GAM Model Estimates

| Week Index | Mean Fatalities (Rolling) | GAM Estimate (95% CI) |
|------------|---------------------------|-----------------------|
| Week 1 | 6.4 | 6.1 (4.8–7.4) |
| Week 2 | 7.1 | 7.3 (6.0–8.6) |
| Week 3 | 9.8 | 9.9 (8.6–11.2) |
| Week 4 | 10.3 | 10.5 (9.2–11.8) |
| Week 5 | 8.6 | 8.4 (7.1–9.7) |
| Week 6 | 6.9 | 6.7 (5.4–8.0) |
| Week 7 | 5.4 | 5.2 (3.9–6.5) |
| Week 8 | 4.7 | 4.5 (3.2–5.8) |

lived experiences that primary collection might mitigate. The focus on numerical patterns risks emphasizing quantifiable aspects of violence over qualitative dimensions of suffering. The research design attempts to address this through integration of narrative descriptors, but limitations remain in capturing the full complexity of Palestinian experiences. The interpretive framework draws from decolonial perspectives that seek to challenge dominant narratives while acknowledging the power dynamics inherent in academic knowledge production about conflict-affected communities. **We have sought to mitigate the risks of extractive analysis by rigorously contextualizing the data’s limitations, avoiding overgeneralization, and making our analytical process fully transparent for critique and reuse. The decision to focus on the West Bank subset was a deliberate methodological choice for depth, but it necessitates caution in extending findings to Gaza, where the conflict dynamics and documentation environment differ significantly.**

The findings have implications for documentation practices in conflict contexts. The systematic recording of incidents creates archives that can supplement traditional human rights monitoring. The mixed-methods approach demonstrates how quantitative and qualitative elements can be integrated to provide more comprehensive documentation. The trustworthiness procedures developed in this research offer models for ensuring credibility in digital witnessing initiatives. However, documentation efforts must balance statistical comprehensiveness with ethical considerations about representation and the potential reduction of human suffering to numerical abstractions. Future documentation practices could benefit from incorporating community review processes to ensure alignment with Palestinian perspectives and priorities. **Our study specifically suggests that including a structured ‘remarks’ or narrative descriptor field, as done in this dataset, is a valuable practice that preserves crucial context and facilitates the kind of integrated analysis performed here.**

Educational implications emerge from how digital witnessing can be incorporated into curricula about conflict documentation and human rights. The dataset provides concrete examples for teaching about quantitative methods in human rights research. The thematic analysis offers case studies for discussing ethical dimensions of representing violence and suffering. The integration of numerical and narrative elements models approaches for teaching about complex conflict contexts. Educational institutions could develop materials that use these findings to foster critical engagement with how conflict data is produced, circulated, and interpreted across different audiences and institutional contexts. **The provided codebook and replication materials can serve as direct pedagogical tools for courses in data ethics, mixed-methods research, and human rights.**

Policy implications relate to how humanitarian organizations and international bodies utilize conflict data in decision-making processes. The findings suggest that systematic documentation can inform resource allocation and protection efforts in conflict-affected areas. The regional patterns could

Table 9: External Validation: Correlation with ACLED Monthly Data (West Bank, Oct 2023–May 2024)

| Metric | Pearson’s r | p-value |
|--------------------|-------------|---------|
| Monthly Fatalities | 0.89 | <0.001 |
| Monthly Incidents | 0.67 | 0.02 |

guide targeted interventions in areas with higher incident frequencies. The temporal trends might inform early warning systems for escalating violence. However, policy applications must consider the limitations of secondary data and incorporate community input to ensure responses align with local needs and priorities. The ethical considerations raised about numerical representation should inform how data is used in policy contexts to avoid reducing human experiences to statistical inputs. **The strong correlation in fatality data across sources suggests that policy actors can have reasonable confidence in trends regarding lethal violence from such datasets, but should be more cautious regarding trends in non-lethal incidents, where reporting variances are greater.**

Several limitations shape the interpretation of these findings. The dataset’s focus on quantifiable incidents may underrepresent forms of violence that are less easily documented through numerical methods. The West Bank subset provides regional specificity but limits generalizability to other contexts. The secondary nature of the data creates dependence on original collection procedures that may reflect specific institutional priorities or methodological constraints. **While we employed GAMs for time-series analysis, establishing causal relationships between external political events and violence patterns requires more sophisticated causal inference frameworks beyond the scope of this study. Our analyses demonstrate association, not causation.** The analysis acknowledges these limitations while suggesting that mixed-methods approaches can partially address gaps through integration of qualitative elements. Future research could expand to include primary data collection and broader geographical coverage to address these constraints.

Ethical dimensions of digital witnessing require ongoing consideration in research and practice. The mediation of human suffering through numerical abstraction raises questions about emotional distance and the potential for dehumanization. The circulation of conflict data through digital platforms creates risks of exploitation or sensationalism. The research process must maintain sensitivity to the traumatic nature of documented events and avoid approaches that could cause additional harm to affected communities. Ethical frameworks from decolonial theory inform these considerations by emphasizing respect for community knowledge and avoidance of extractive research practices that objectify suffering for academic purposes. **Our commitment to transparency—sharing data, code, and the codebook—is itself an ethical practice, enabling scrutiny and challenging the opacity that often surrounds the analysis of sensitive conflict data.**

This discussion has examined how digital witnessing through conflict datasets extends moral testimony in contexts where traditional reporting faces constraints. The findings demonstrate specific mechanisms through which numerical data constructs authenticity, fosters epistemic trust, and acquires moral meaning through institutional framing. The analysis contributes to understanding how Palestinian experiences are documented and communicated through evolving technological platforms. The implications for documentation practices, educational approaches, and policy applications suggest pathways for utilizing these insights in practical contexts while maintaining ethical engagement with the limitations and complexities of representing human suffering through numerical data.

7 CONCLUSIONS AND FUTURE WORK

This study demonstrates how numerical conflict datasets function as digital witnessing that extends moral testimony in contexts where traditional reporting faces constraints. The mixed-methods analysis reveals mechanisms through which quantitative data constructs authenticity, fosters epistemic trust, and acquires moral meaning through institutional framing. **By strengthening the methodological rigor with inferential statistics, external validation, and a transparent qualitative codebook, we provide a more robust empirical foundation for these claims than prior conceptual discussions.** These findings contribute to understanding how Palestinian experiences are documented and communicated through evolving technological platforms. The research positions numerical data as legitimate forms of

testimony that can withstand political challenges while acknowledging the limitations of numerical abstraction in capturing the full complexity of lived experiences under conflict conditions.

The qualitative approach contributes to ethical documentation by preserving narrative elements that contextualize numerical data. This integration of quantitative patterns with qualitative themes provides a more comprehensive understanding of Palestinian experiences than either approach could achieve independently. The methodology supports narrative preservation by treating data entries as units of collective memory that document experiences which might otherwise remain unrecorded. This approach facilitates dialogue in policy and education by providing evidence frameworks that balance statistical rigor with ethical representation of human suffering across different institutional contexts and audience groups.

Future research should expand to include comparative analysis of documentation practices across different conflict contexts and cultural settings. Investigations into cross-cultural understanding could examine how numerical testimony is interpreted across diverse audiences with varying relationships to the documented events. Research in conflict medicine might explore how health impacts are documented through similar digital witnessing approaches. Humanitarian response studies could develop frameworks for utilizing conflict data in emergency planning while maintaining ethical engagement with affected communities. **A direct next step stemming from this study would be to apply the same mixed-methods framework to the Gaza portion of the War in Gaza dataset, conducting a comparative analysis to identify commonalities and differences in digital witnessing mechanisms between the West Bank and Gaza contexts. Furthermore, future work should involve primary engagement with data curators and community documenters to ground the analysis of 'moral testimony' in the intentions and experiences of those creating the records.** These directions would extend the current findings to address broader questions about documentation, representation, and response in contexts of systematic violence and political conflict.

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THEME 1: DIGITAL WITNESS AS SURVIVAL

Definition: Remarks that explicitly reference technology, digital media, or recording devices as tools for documenting the incident, preserving memory, or providing evidence.

- **Sub-theme 1.1: Evidentiary Recording:** Mentions of footage, photos, live streams, or audio being captured. *Example:* "The raid was documented by several live streams from rooftops."

- **Sub-theme 1.2: Archival/Prevention of Erasure:** References to the act of recording as a means to prevent historical denial or forgetting. *Example:* "Residents filmed the demolition to ensure it couldn't be denied."

THEME 2: ANONYMITY AND COLLECTIVE VOICE

Definition: Remarks where individual identities are subsumed into collective categories (e.g., "youths," "residents"), or where the suffering described is presented as a shared communal experience.

- **Sub-theme 2.1: Generic Group Referents:** Use of non-specific group labels for victims or actors. *Example:* "Several youths were arrested at the checkpoint."
- **Sub-theme 2.2: Communal Suffering:** Descriptions that frame impacts as affecting a family, neighborhood, or community collectively. *Example:* "The airstrike devastated the entire neighborhood."

THEME 3: DATA AS MORAL REPLACEMENT

Definition: Remarks that position the dataset entry itself as filling a gap left by absent, inadequate, or biased traditional media or institutional reporting.

- **Sub-theme 3.1: Under-reporting Framing:** Explicit statements that the incident received little to no major media coverage. *Example:* "This clash was not reported by any international news agencies."
- **Sub-theme 3.2: Counter-narrative Function:** Implicit or explicit suggestion that the record corrects a dominant narrative. *Example:* "Official sources claimed no casualties, but local reports confirm two fatalities."