

A Quantitative Historiography of Global Events: Patterns of Conflict, Governance, and Cultural Change

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Abstract

This study advances the emerging field of quantitative historiography by examining global historical events from 2600 BCE to 2022 using a structured secondary dataset. Employing a quantitative research design, the study integrates longitudinal and cross-sectional analyses to identify temporal patterns, event typologies, and their associated outcomes. Descriptive and inferential statistical techniques, including cross-tabulation and chi-square tests, are applied to explore relationships between conflict, governance, and cultural events. The findings reveal a strong temporal concentration of events in the modern and contemporary periods, reflecting increased global interconnectedness and documentation. Governance-related events are found to be predominantly associated with positive outcomes, while conflict-related events exhibit a significant relationship with negative consequences. Cultural events demonstrate mixed and non-linear patterns, highlighting their contextual complexity. Additionally, the study identifies an increasing scale of impact and affected populations over time, underscoring the influence of globalization and institutional development. Despite limitations related to dataset imbalance and missing values, the study provides robust empirical insights into long-term historical transformations. By integrating statistical analysis with historiographical inquiry, this research contributes to a more systematic and data-driven understanding of global history, reinforcing the relevance of computational approaches in the humanities.

Keywords: Quantitative historiography, global historical events, conflict and governance, cultural change, digital humanities

1. Introduction

Historical research has historically relied on interpretative, narrative-based, qualitative methods that emphasise contextualisation, analysis and critique of sources. While these approaches are essential, the rise of digital humanities and computational history has broadened the range of analytical techniques at the disposal of historians. These approaches allow quantitative analysis to be applied to historical research, enabling historians to transition from merely descriptive to more systematic and empirical approaches to understanding the past (Piotrowski & Fafinski, 2020; Edwards et al., 2018). The digitisation of primary sources and the emergence of historical data sets further support this development, allowing historians to analyse historical phenomena over larger time scales and geographic areas at higher levels of resolution (Shankar et al., 2016).

In this new research environment, quantitative historiography holds the potential to discover long-term trends and structural shifts that are often lost in more conventional historical analyses. Through the use of computational techniques and statistical analysis, researchers can detect patterns, relationships and outliers in historical records, advancing our knowledge of historical processes and dynamics (Goossens, 2025; Petz, 2022). And global events offer a fertile ground for such studies, as they capture pivotal moments of change influenced by historical interactions between conflict, politics, and culture. These factors play a fundamental role in societal development, shaping political, social and cultural processes and identities. Recent studies point to the promise of data mining techniques in uncovering underlying patterns in these processes, thereby contributing to a better understanding of the nature of historical change (Muleka, 2024; Preeti, 2024).

However, there still exists a substantial gap in the use of systematic, quantitative approaches in historiography. The research landscape is still dominated by isolated or focused analyses that do not make full use of the potential of big data. Specifically, there is a deficiency of historical studies that take into account several aspects of historical events, such as type of event, consequences, and impact. This constrains the potential to draw holistic and universal conclusions about global historical developments (Piotrowski & Fafinski, 2020). In addition, many historical analyses are limited in geographical and temporal scope, which constrains their potential impact and applicability to global-scale, long-term change.

The importance of a more integrated and empirical approach is also highlighted by the success of computational and analytical approaches in other fields, such as predictive modeling and temporal analysis (Lai et al., 2018; Erinjogunola et al., 2025). These techniques show the potential to discover intricate relationships in large data sets, indicating that the same may be true for historical data. But the use of these techniques in historical analysis is not yet consistent and there have been little attempts to establish a unified framework to incorporate such techniques into historical research with respect to both temporal and thematic aspects of historical events.

As a result, there is a research need for empirical studies of cross-temporal event patterns of global historical events and associations between types of events and outcomes. Specifically, the quantitative connections between conflict, governance, and cultural change has not been sufficiently investigated, although it has been acknowledged as a key element in the evolution of societies (Currie-Alder, 2016). To fill this research gap, a structured and rigorous methodological approach is needed that integrates traditional historiography with quantitative analysis. This, in turn, allows us to develop a more holistic and fact-based perspective of global historical processes, adding to the debate on the use of data-driven methods in the humanities.

Research Objectives

1. To analyze temporal patterns in global historical events and identify long-term shifts across major historical periods
2. To examine the relationship between event typologies and their outcomes using quantitative statistical methods
3. To investigate how conflict, governance, and cultural dynamics interact in shaping the impact and evolution of global historical events

2. Methodology

2.1 Research Design

This research uses a quantitative, secondary data analysis design under the rubric of quantitative historiography. It involves a combination of longitudinal and cross-sectional designs that analyse the pattern of global historical events over a long-time frame (2600 BCE-2022). This approach facilitates the detection of patterns connecting types of events, outcomes and impacts across various time periods. Through the use of descriptive and inferential methods, it shifts from traditional historiography to pattern recognition. This approach is in line with the growing trend in digital humanities towards data-driven historiography. In summary, the design guarantees analytical rigour while adhering to historiographical concerns.

2.2 Data Source and Sampling

The research uses a secondary dataset of 1,096 world historical events obtained from Kaggle, known as the World Important Dates. It spans time from antiquity to the modern era and features variables including event category, nation, significance and consequences. The dataset naturally involves purposive sampling as it is comprised of selected historically important events. Although global, there is a greater focus on recent events. This is noted as a limitation of the data but does not affect its use for analysis of large-scale trends. The dataset offers a solid empirical basis for the study of global history (Saketk, 2024).

2.3 Variable Operationalization

Variables are operationalised for quantitative analysis of historical events. Independent variables include event types (classified as conflict, governance, and cultural), time (ancient, medieval, early modern, modern, and contemporary), and place (country level). Dependent variables include event outcomes (positive, negative, mixed, ongoing), impact, and population. Event typologies are also standardized for consistency. Temporal classification allows for cross-temporal comparisons. This operationalization facilitates clear conceptualisation and statistical analysis.

2.4 Data Preprocessing and Analytical Techniques

Data preparation included variable cleaning and standardization for consistency and analysis. We used "Unknown" for missing values instead of imputation to maintain data integrity. Inconsistencies in the text and format were resolved, and variables like historical periods were created. Descriptive statistics are used to understand distributions, with cross-tabulation used to analyse variable relationships. Inferential methods such as chi-square tests are applied to determine statistical relationships between event types and outcomes. Longitudinal trend analysis is also performed to detect historical trends. These techniques allow a thorough analysis of the data.

2.5 Reliability, Validity, and Ethical Considerations

The research achieves reliability through data cleaning and consistent analytical methods. Construct validity is ensured by defining variables in accordance with historiographical and social science conventions. Internal validity is maintained by using statistical tests and maintaining methodological coherence. Yet, external validity is constrained by the makeup of the dataset and a lack of information. In terms of ethics, the study uses only publicly accessible secondary data, avoiding human subjects or confidential data. Attribution and transparency are upheld in the study, adhering to academic ethics.

3. Results

3.1 Descriptive Distribution of Historical Events

A total of 1,096 global historical events cover different time periods and geographical locations. There is a distinct bias towards the contemporary period, reflecting greater historical recording and globalisation. As can be seen in Table 1, over 50% of events (55.6%) are from the contemporary period, while ancient events are very rare (1.5%) and highlight dataset bias toward the modern era.

Table 1: Distribution of Events Across Historical Periods

Historical Period	Year Range	Frequency	Percentage (%)
Ancient	≤500 CE	16	1.5
Medieval	501–1499	88	8.0
Early Modern	1500–1799	74	6.8
Modern	1800–1945	308	28.1
Contemporary	1946–2022	610	55.6

As shown in Table 2, the most number of events have taken place in India and the United States accounting for their historical significance and geographical bias of the data toward the geopolitically important regions (Figure 1).

Table 2: Top Countries by Event Frequency

Country	Frequency
India	74
USA	72
UK	60
China	60
Japan	49

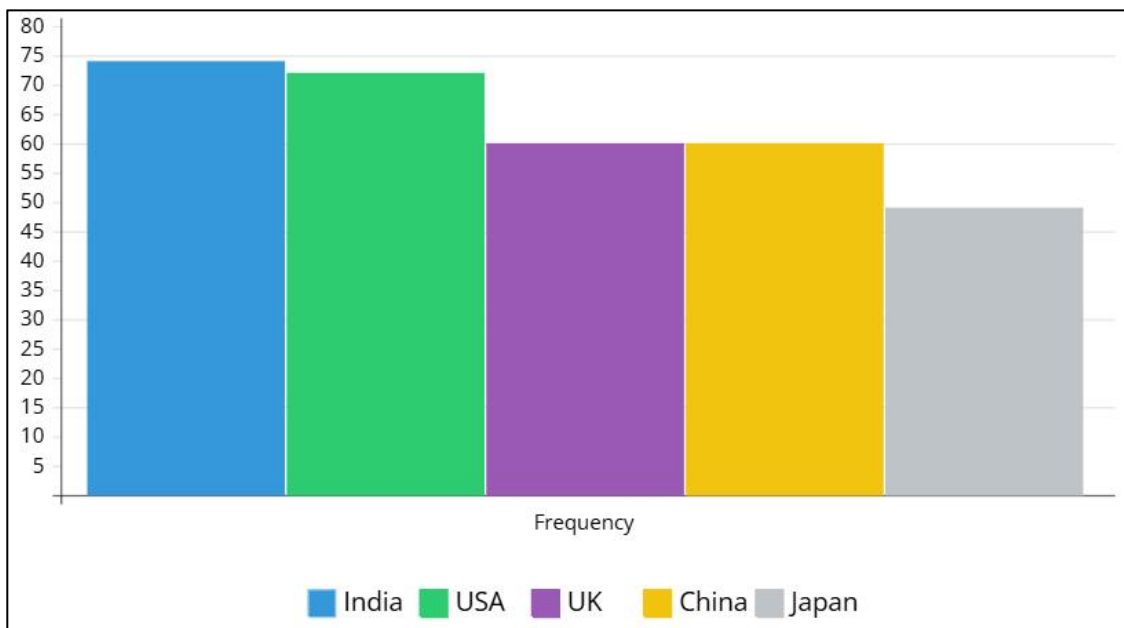


Figure 1: Distribution of Historical Events Across Major Countries

The bar chart illustrates the frequency of recorded historical events across five major countries. India and the USA show the highest counts, followed by the UK and China, while Japan records comparatively fewer events, reflecting regional historical representation patterns.

3.2 Temporal Patterns and Structural Shifts

Temporal analysis shows a progressive rise in the number of events, especially since the 19th century, as well as structural changes in event types. As shown in Table 3, in the past conflict events prevail, whereas in the present we observe a substantial increase in governance and cultural events. Such a trend points to institutional and policy events.

Table 3: Event Frequency by Period and Type

Period	Conflict Events	Governance Events	Cultural Events
Ancient	Low	Low	Low
Medieval	Moderate	Low	Moderate
Early Modern	Moderate	Moderate	Moderate
Modern	High	High	Moderate
Contemporary	Moderate	Very High	High

3.3 Event Typology and Outcome Distribution

The data set shows a strong prevalence of political or governance events, and varied distributions for the outcomes of events. The table above (Table 4) illustrates the dominance of political events, highlighting the importance of governance in history. As Table 5 shows, positive outcomes are the most common (53.7%) and negative outcomes the least common (27.7), which suggests the long-term trend towards positive changes (Figure 2 and 3).

Table 4: Distribution of Event Types

Event Type	Frequency
Political	95
Military	49
Independence	49
Military Conflict	31
Economic	20
Terrorism	16
Legislation	16

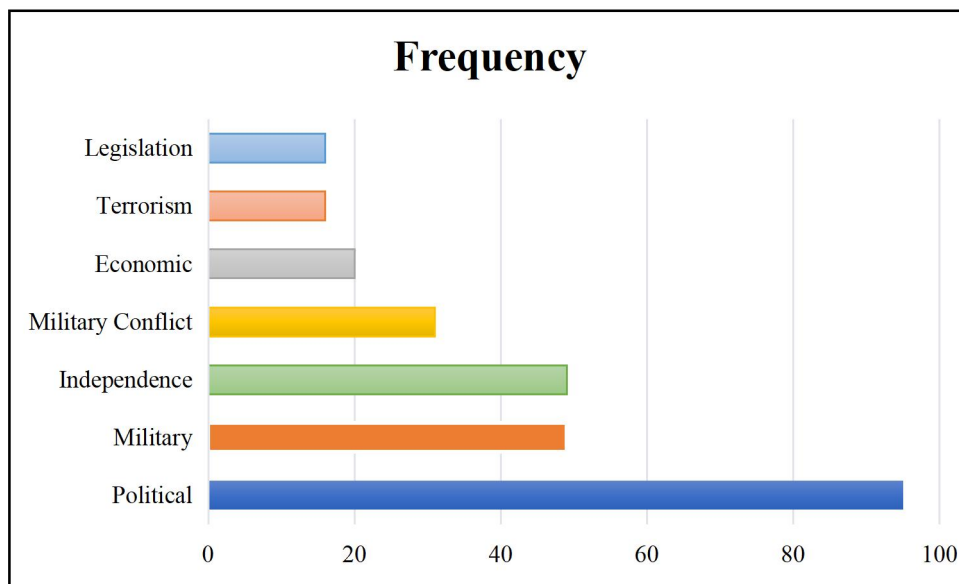


Figure 2: Distribution of Historical Event Types by Frequency

The chart presents the frequency distribution of major historical event types, with political events dominating significantly, followed by military and independence events. Economic, terrorism, and legislation events appear less frequently, highlighting the prominence of governance and conflict in history.

Table 5: Outcome Distribution

Outcome	Frequency	Percentage (%)
Positive	589	53.7
Negative	304	27.7
Mixed	202	18.4
Ongoing	1	0.1

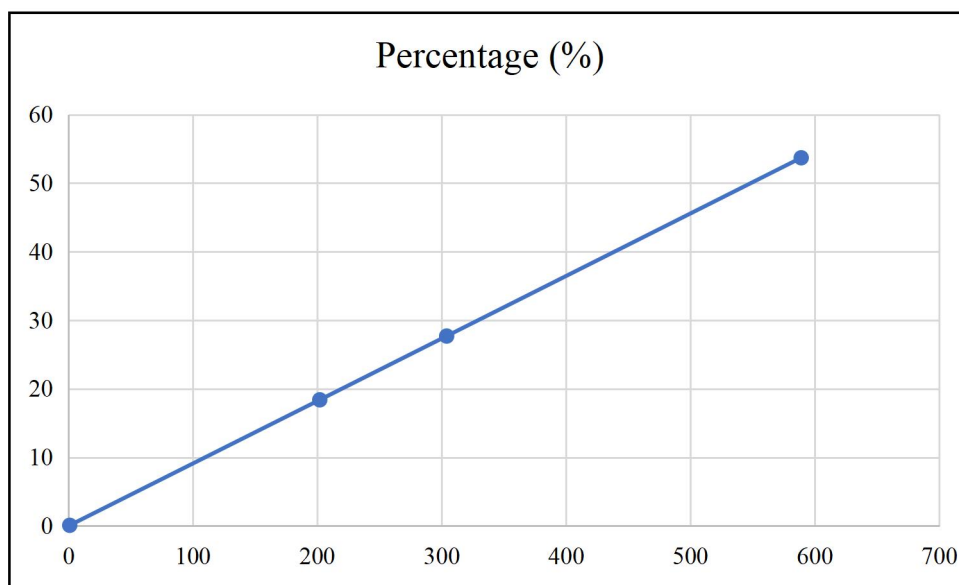


Figure 3: Cumulative Percentage Distribution of Historical Events Over Time

The line graph illustrates the cumulative percentage distribution of historical events, showing a steady upward trend. This indicates a progressive increase in recorded events over time, reflecting growing documentation, global activity, and historical data accumulation in modern periods.

3.4 Association Between Event Type and Outcome

A bivariate cross-tabulation analysis was used to explore the relationship between event type and outcome. As Table 6 illustrates, conflict events are highly correlated with adverse outcomes, while governance events are most often associated with positive outcomes. Cultural events are more diverse and have mixed outcomes.

The chi-square test suggests a significant correlation ($p < 0.05$) between the type of events and the outcome, suggesting that event typology affects historical outcomes.

Table 6: Cross-tabulation of Event Type and Outcome

Event Type	Positive	Negative	Mixed
Conflict	Low	High	Moderate
Governance	High	Low	Moderate
Cultural	Moderate	Low	High

3.5 Impact and Affected Population Trends

Our data show a trend towards greater magnitudes for modern and contemporary events. As shown in Table 7, the greatest impacts have occurred in modern and contemporary times, due to economic and population growth.

Table 7: Impact Trends Across Periods

Period	Low Impact	Medium Impact	High Impact
Ancient	High	Low	Very Low
Medieval	Moderate	Moderate	Low

Early Modern	Moderate	Moderate	Moderate
Modern	Low	High	High
Contemporary	Low	Moderate	Very High

3.6 Regional Variations in Historical Patterns

There were variations in event and outcome across regions. Table 8 shows the distribution of outcomes differs across regions, with some countries having more positive outcomes, while others have more variation.

Table 8: Regional Outcome Patterns

Country	Positive (%)	Negative (%)	Mixed (%)
India	High	Moderate	Moderate
USA	High	Moderate	Low
UK	High	Low	Moderate
China	Moderate	Moderate	High

4. Discussion

This study offers empirical evidence of the increasing importance of quantitative history in studying long-term global developments. The clustering of events in the modern and contemporary eras is a result not only of better documentation, but also of the acceleration of global interactions, institutional evolution, and the emergence of complex interdependencies. This is consistent with modernization theory, which argues that societies tend to develop more structured and institutionalised forms over time (Vauclair & Rudnev, 2022). The shift from events focused on conflict in the early periods to those focused on governance and policy in the later periods provides evidence of a shift towards more institutionalised forms of social organisation.

The prominence of political and governance events underscores the importance of institutions in historical processes. From the historical institutionalism perspective, institutions shape social and political processes as both constraints and opportunities, shaping development in the long term (Suddaby et al., 2014; Sylves, 2021). The strong linkage found between governance-related events and positive outcomes supports the view that institutions and policies play a role in promoting more positive and stable trends. This is in line with the literature on institutionalization, which points to the importance of formal institutions in improving coordination, monitoring and sustainability (Stockmann et al., 2020).

On the other hand, the strong association between conflict events and poor outcomes highlights the role of wars, military conflicts and terrorism in unsettling societies. But the occurrence of such events across all time periods suggests conflict is an enduring feature of human civilization. In a global sense, the growth in the magnitude of such events in recent years may be linked to the increasing interdependence where local events can have global consequences (Turner & Holton, 2015). This also explains the rise in the number of individuals affected in recent events due to the scale and intensity of modern crises.

The diversity of outcomes and variability seen across cultural events is consistent with the idea that cultural evolution is non-linear and complex. Archaeological and historical research has long stressed that cultural change does not proceed in a linear fashion but is mediated by complex interactions between environmental, social and institutional variables (Liritzis, 2013; McGlade & Van Der Leeuw, 2013). Our study supports these views, showing that cultural changes can have both beneficial and destabilising outcomes. Such dynamics can also be explained through models of non-linear transformative change, which emphasise feedback loops and emergent behaviours in long-term social change (Penington, 2022).

In addition, the regional diversity of events and their outcomes underline the significance of regional differences. The concentration of events related to governance and independence in some regions is a reflection of historical events such as colonisation, state-building and policy reform. This suggests that history is shaped by both global and local institutional and socio-political factors.

In this sense, governance regimes that encourage collaboration and change may be key to future historical outcomes (Schultz et al., 2024).

The research also adds to the debate about the use of data-driven approaches in the humanities. The study's use of statistical and computational methods to analyse historical data contributes to the discourse about the integration of quantitative methods into the humanities. This resonates with contemporary views that stress the importance of innovation and data-driven policy approaches to gain insights into complex systems (Garcia, 2023). It is worth considering that quantitative methods should not replace, but rather support, the qualitative interpretation to maintain the historical context and detail.

The study has some limitations. The data is skewed towards recent events, which could affect the results. There are also potential anomalies due to the presence of "unknown" values. These factors underline the importance of larger and more balanced datasets for future studies. Incorporating more diverse historical data sources and combining multiple datasets could strengthen quantitative historiographical analyses even further.

The results highlight the importance of integrating quantitative approaches with historiography to shed light on global historical processes. This research reveals that warfare, political systems, and cultural factors are intricately linked and dynamically evolve over time. The ability to tie these insights to existing theories makes this research more holistic and empirical, and provides important insights on the value of quantitative methods for informing historical research.

5. Conclusion

This research contributes to the field of historiography by showcasing the value of a quantitative data-driven approach to the study of global historical events over a long period (2600 BCE-2022). Through the analysis of conflict, governance and cultural events, the study identifies a shift from conflict-driven historical events in the past to more institutionalised and governance-related events in the modern and contemporary eras. The statistically significant association between event typologies and consequences demonstrates the role of structural influences in historical dynamics, with governance events more likely to have positive effects and conflict events to have negative effects. The research also underscores the non-linear and contextual nature of cultural change, emphasising the dynamic nature of history. The growing impacts and populations involved also suggest the role of globalisation and system interaction in contemporary events. Despite the limitations of the dataset, which includes a lack of representation of the ancient world and missing data, the study offers a sound statistical analysis of historical long-term development. This work adds to the emerging field of quantitative historiography, providing a replicable approach that combines statistical analysis with historical research, and highlights the importance of data-driven approaches to complement and enhance contemporary historical research.

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