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A comparative analysis of digital archival practices in health crisis management between the 1918 Spanish flu and COVID-19 pandemics

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Abstract

The study explores the dynamics of health advisories and responses during health emergencies and their effectiveness. This study also analyzes the role of digital archives in crisis management and why these archives chose specific photographs, offering light on how archival decisions shape historical narratives. This paper employs a two-stage research method, including a semi-systematic review of 23 articles and a visual rhetorical analysis, to collect documents or photographs from Texas Woman's University's National Archives and Digital Collections on two significant health crises collections: the 1918 Spanish flu and COVID-19. The semi-systematic reviews found 23 articles that provide a clear indication of how public health agencies effectively provide health advisories and how different social and cultural groups, including ethnic minority and migrant women, respond to health crises and are impacted unevenly. The review also underscores significant rhetorical practices in media, using different communication methods and terminologies, while emphasizing the enduring role of archival practices in preserving and analyzing records during pandemics. Visual rhetorical analysis also reveals how pandemic representation and public perception have evolved over the century, influenced by digital archives. In addition, while photographs from both pandemics underscore the risks of mass gatherings, the analysis also shows how societal priorities, such as patriotism or social justice, outweighed health concerns, demonstrating the enduring tension between public health and collective societal actions. Furthermore, the analysis reveals how technological advancements have transformed communication strategies over time. This study concludes that digital archival collections not only preserve history but also provide practical insights for pandemic management, highlighting the dynamic interplay of societal, technological, and health narratives over time.

Keywords COVID-19, 1918 Spanish flu, Digital archive, Visual rhetoric, Crisis management

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1 Introduction

Health advisories and responses are crucial in understanding and managing crises because they expedite medical intervention, guide resource allocation, and support societal resilience after disasters [1]. The 1918 Influenza Pandemic, also known as the Spanish Flu, and the recent COVID-19 pandemic are two major health crises in modern human history that offer valuable insights into the effects of global health emergencies [2]. Beyond their epidemiological consequences, these crises highlight the role of healthcare agencies, media institutions, and archival bodies in shaping public awareness, collective memory, and perceptions during emergencies. They also underscore the importance of managing narratives in times of crisis, when uncertainty, fear, and political tensions intersect [3, 4].

The 1918 influenza virus infected approximately 500 million people worldwide and caused an estimated 50 million deaths [5, 6]. In the United States alone, nearly one-quarter of the population was infected, resulting in approximately 675,000 fatalities and a significant decline in life expectancy [7]. Despite its magnitude, the 1918 epidemic remained relatively underemphasized in American historical consciousness until renewed scholarly and public attention emerged during the COVID-19 pandemic [8]. Conversely, the COVID-19 pandemic has unfolded in a digitally connected world [9]. Globally, more than 7 million confirmed deaths have been recorded, including over 1.2 million in the United States [10]. While these statistics demonstrate the severity of both pandemics, they also signal that pandemics are not only biological crises but communicative and archival events that generate records, images, narratives, and memories.

Recent scholarship in archival studies and memory studies argues that archives are not neutral [11–13]repositories of documents but active sites of mediation, selection, and power [14, 15]. Archival processes determine what is preserved, described, digitized, and made visible, thereby shaping how societies remember crises and how future generations interpret them. [16] In digital environments, this mediating role is intensified through metadata design, searchability, and platform infrastructures that influence what becomes discoverable and circulates widely. Therefore, digital archives function not only [11, 12, 17]as storage systems but as rhetorical spaces that frame public understanding of historical events.

Employing visual rhetorical analysis has gained increasing relevance in examining how images participate in historical meaning-making. Finnegan [18, 19] conceptualizes visual rhetoric as both images in history and images as history, emphasizing that photographs are rhetorical artifacts that guide judgment, shape interpretation, and influence collective memory. Photographs preserved in digital archives are therefore not merely illustrative supplements,they are curated selections embedded within institutional narratives. The relationship between photographs and archives raises questions about authority, representation, and inclusion, particularly during moments of crisis.

At the same time, tensions persist between institutional control and participatory documentation in pandemic archiving [4, 20]. While institutions often retain substantial authority over what is preserved—frequently privileging dominant political or cultural narratives [15]—decentralized, user-driven digital archives allow individuals to document lived experiences outside formal institutional frameworks [21]. Community-driven archival projects, including oral histories and personal submissions, expand the historical record and complicate singular institutional accounts [22]. The struggle for narrative

authority between institutions and publics [13, 17]becomes especially visible during health crises, when memory-making unfolds in real time.

In this context, two digital archives provide a compelling comparative framework: the U.S. National Archives' collection on the 1918 influenza pandemic and the Texas Woman's University (TWU) COVID-19 Digital Collection. The National Archives, as a federal institution, historically emphasizes governmental and military documentation. In contrast, TWU's COVID-19 collection actively solicited submissions from students and communities, foregrounding personal narratives, reflections, and creative artifacts [23]. These differing archival models—one primarily institutional and state-centered, the other participatory and community-driven—offer an opportunity to examine how digital archival practices construct distinct pandemic narratives.

Although prior studies have examined newspaper coverage [24], rapid-response archiving projects [25], and global efforts to document COVID-19 [26], limited scholarship has comparatively analyzed how digital archives curate visual materials across both the 1918 influenza and COVID-19 pandemics. Existing research often focuses on a single pandemic, a single medium, or a specific national context. Consequently, there remains a gap in understanding how archival practices across different technological eras shape rhetorical constructions of pandemic memory and authority.

This study addresses that gap by asking: How do digital archival practices shape the rhetorical construction of pandemic memory across historical and technological contexts? Rather than evaluating the epidemiological effectiveness of health advisories, this study examines how selected photographs, artifacts, and descriptions within digital archives frame public understanding of crisis management, societal adaptation, and collective resilience. By combining a semi-systematic literature review with visual rhetorical analysis, the study compares how the National Archives and TWU curate, contextualize, and present pandemic materials. Comparative analysis of the 1918 Influenza and COVID-19 pandemics through digital archives has significant implications. This paper enables a comparative examination of how institutional authority and participatory documentation shape collective memory. In addition, it also reveals how technological infrastructures—from print-based documentation to interactive digital platforms—transform the visibility and circulation of pandemic imagery. Finally, this paper also contributes to interdisciplinary scholarship at the intersection of health communication, archival studies, and memory studies by demonstrating that digital archives do not merely preserve historical records; they actively mediate narratives of crisis, responsibility, and resilience.

Following this introduction, Section II presents the research methods, including a semi-systematic literature review and visual rhetorical analysis. Section III outlines the findings of the review, organized under thematic categories. Section IV presents the results of the visual rhetorical analysis. Section V discusses the implications of these findings for archival theory, health communication, and collective memory, followed by concluding reflections.

2 Literature review

The COVID-19 pandemic generated unprecedented efforts by archives, libraries, and memory institutions to document events as they unfolded. Greenwood [26], in a historical review of pandemic archiving practices, demonstrates that COVID-19 collecting initiatives varied widely in scope, methodology, and technological infrastructure.

These initiatives expanded archival practice beyond traditional institutional records to include digital submissions, social media materials, photographs, and personal reflections (). Similarly, Neatrour et al. [27] document the creation of the Utah COVID-19 Digital Collection, illustrating how regional institutions rapidly mobilized digital platforms to capture local experiences. Kosciejew [28] further argues that national archives do not simply preserve records but actively shape public understanding of crises through thematic framing and selection practices. In a related study, Kosciejew [29] analyzes non-pharmaceutical intervention signage as documentary artifacts, emphasizing how everyday materials become part of the archival record and influence how pandemics are remembered. Moreover, these studies indicate that archival institutions play an interpretive role in constructing the historical record of public health emergencies.

In addition, a significant development during COVID-19 has been the growth of participatory and community-based digital archiving. Bannell and Sexton [30] explore how affect and emotion shaped rapid-response collecting in the United Kingdom, arguing that many archives foregrounded personal narratives to capture lived experiences of crisis. Noordegraaf et al. [31] similarly show how community archives documented the social and cultural effects of the pandemic, expanding the scope of archival evidence beyond official documentation.

Jones et al. [32] frame pandemic documentation as a form of honoring collective experience, highlighting the ethical and civic dimensions of preservation. These participatory models reflect broader theoretical shifts in archival studies toward inclusivity and democratization, though tensions remain between institutional authority and grassroots contributions [9, 20].

Moreover, archival theory similarly underscores that archives are embedded within power structures. Schwartz and Cook [15] argue that archival practices are shaped by political and institutional authority, influencing what becomes visible or marginalized within the historical record. Archival responses to COVID-19 were also framed as professional responsibilities. The International Council on Archives (ICA, 2020) emphasized that the "duty to document" becomes more essential during crises, encouraging institutions worldwide to preserve records of governmental and societal responses. Scholarly analyses confirm that such institutional framing influenced how archives mobilized resources and prioritized documentation [26, 28]. However, much of the documented archival activity remains concentrated in North American and European contexts. This concentration raises questions about geopolitical inequalities in digital memory production and the uneven global visibility of pandemic experiences. While digital technologies expand participation, they may simultaneously reproduce structural hierarchies shaped by institutional resources and technological infrastructure.

Although substantial scholarship now examines COVID-19 archiving, comparatively fewer studies analyze digital archival representations across both the 1918 influenza and COVID-19 pandemics. Existing research tends to focus on single-case studies, national contexts, or specific media forms. Comparative analyses of how archival infrastructures across different technological eras shape rhetorical constructions of pandemic memory remain limited.

By juxtaposing the U.S. National [7] influenza collection with Texas Woman's University's participatory COVID-19 archive, this study addresses that gap. It extends archival and memory scholarship by comparing institutional and community-centered archival

models across historical periods, examining how digital curation practices mediate authority, representation, and collective memory during health crises.

3 Research methods

This study adopts a comparative design to examine how digital archival practices shape representations of two major health crises: the 1918 Spanish Influenza pandemic and the COVID-19 pandemic. Rather than evaluating epidemiological effectiveness, the study focuses on how archival curation and visual rhetoric frame public understanding of crisis management and collective memory. To address this objective, a two-stage research approach was employed, consisting of a semi-systematic literature review followed by a visual rhetorical analysis of selected digital archival materials.

3.1 Semi-systematic literature review

The study conducted a semi-systematic, or narrative, literature review guided by principles of structured search transparency and thematic synthesis [33, 34]. The semi-systematic approach is particularly appropriate for interdisciplinary domains in which concepts are defined differently across fields and methodological designs vary substantially [33]. Rather than estimating effect sizes, this approach enables the synthesis of theoretical perspectives and thematic patterns across heterogeneous studies. The review process followed the logic of PRISMA model to enhance transparency in article identification, screening, and inclusion.

An initial search was conducted in March 2024 using PubMed and ScienceDirect, complemented by Google Scholar to capture interdisciplinary and grey literature relevant to archival studies and communication scholarship. Boolean combinations were employed to ensure systematic retrieval of relevant studies. Search strings included combinations such as "Spanish flu" AND "digital archive," "COVID-19" AND "digital archive," "pandemic" AND "visual rhetoric," "COVID-19" AND "archival practices," and "1918 influenza" AND "media representation." The search was limited to publications between 2018 and 2023 in order to capture contemporary scholarship related to COVID-19 while enabling comparative reflection on the 1918 pandemic. Inclusion criteria required that studies be peer-reviewed journal articles published in English and address issues related to pandemic representation, archival practices, public health communication, or collective memory. No restrictions were placed on research design, allowing qualitative, quantitative, mixed-methods, and theoretical contributions to be considered. Exclusion criteria included books, book reviews, non-English publications, studies published before 2018, and articles unrelated to the communicative or archival dimensions of pandemics.

The initial search yielded 78 records, including 75 from PubMed & ScienceDirect and 3 additional relevant studies were identified through Google Scholar searches and reference chaining (Fig. 1). After removing duplicates across databases, 66 records remained. Title and abstract screening excluded 10 studies deemed unrelated to the research focus. A further 30 articles were excluded following full-text review due to insufficient engagement with archival, rhetorical, or communicative dimensions of pandemic representation. The final corpus consisted of 23 peer-reviewed articles directly aligned with the objectives of this study (Table 1). This structured yet flexible process aligns with established standards for semi-systematic reviews and narrative synthesis [33, 34].

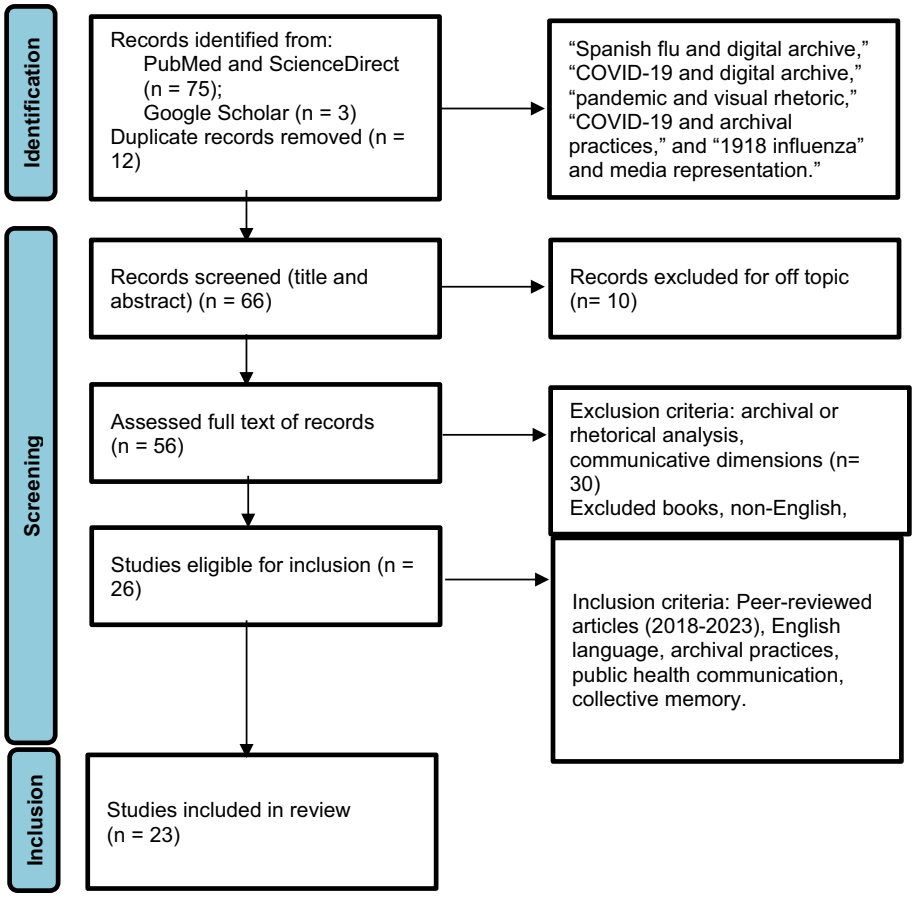


Fig. 1 PRISMA flow diagram for semi-systematic of this study

3.2 Visual rhetorical analysis

The second stage of the research involved a visual rhetorical analysis of digital archival materials. The analysis draws on Finnegan's [18, 19] conceptualization of visual rhetoric as both "images in history" and "images as history." In this framework, photographs are understood not as transparent representations of reality but as rhetorically constructed artifacts whose meanings emerge through interaction between image, viewer, and contextual framing. Digital archives are therefore approached as rhetorical environments that mediate interpretation through selection, categorization, metadata description, and digital presentation.

Images were identified using internal archive search tools and keyword queries such as "Spanish flu," "influenza 1918," "mask mandate," "military hospital," "COVID-19," "health advisory," "social distancing," and "quarantine." Selection criteria focused on materials that visually represented public health advisories, healthcare settings, large public events, quotidian life adaptations, artifacts, and personal or institutional narratives. The goal was to ensure thematic comparability across the two pandemics while remaining attentive to differences in historical context and technological mediation.

Each selected image was analyzed using a structured interpretive framework. The analysis considered the tone of the image (for example, authoritative, collaborative, or affective), visual composition and framing, textual messaging embedded within the image, historical and institutional context, communicative purpose, and archival

Table 1 Summary of articles under themes

Themes	Articles	Methods	Study location	Coverage
Public health Measures and Responses	Tambolkar et al. [3]	Systematic narrative review	–	Spanish Flu and COVID-19
	Minenko [35]	Criminal case records and legal documents	Canada	Spanish Flu
	Alexander [36]	Historical analysis	Mexico	Spanish Flu
	Bambra et al. [37]	Administrative data; GIS	England and Wales	Spanish Flu
Societal and Cultural responses	Adams and Kopelman [20]	Photograph/archival analysis	England	COVID-19
	Kildea [38]	Historical analysis	Australia	Spanish Flu and COVID-19
	Novaes [39]	Qualitative methods; Textual and Contextual Analysis	Brazil	Spanish Flu and COVID-19
Media Representation, Communication, and Terminology	Edwards [24]	Qualitative analysis based on newspaper coverage	Spain	Spanish Flu and COVID-19
	Barnett [40]	Historical case study; newspaper coverage	Spain and Canada	Spanish Flu
	Ding and Pandya [41]	Discourse Analysis; Newspaper Reports	India	COVID-19
	Ogbodo et al. [42]	Content analysis; LexisNexis database and websites	Global media outlets	COVID-19
	Hoppe [43]	Review and commentary		Spanish Flu
	Budhwani and Sun [44]	Quantitative analysis; Social media data	USA	COVID-19
	Lanza et al. [45]	Terminological comparative analysis and semantic analysis	–	Spanish Flu and COVID-19
	Rovetta and Bhagavathula [46]	Google Trends; Newspapers and government websites	Italy	COVID-19
Uneven Impact of Pandemics on Different Regions and Social Groups	Bambra et al. [37]	Administrative data; GIS	England and Wales	Spanish Flu
	Hupkau and Victoria [47]	Comparative analysis; survey data	Spain	COVID-19
	Palen [48]	Mixed methods; historical analysis and literature review	–	Spanish Flu and COVID-19
	Bambra et al. [49]	Historical analysis	–	Spanish Flu and COVID-19
	Sharma et al. [50]	Systematic literature review	India; systematic review	Spanish Flu and COVID-19
Archival Practices and Analysis on Pandemics	Adams and Kopelman [20]	Photograph/archival analysis	England	COVID-19
	Gourley [51]	Qualitative content analysis and social media; Archival analysis	Australia	COVID-19
	Greenwood [26]	Historical archival approach	–	COVID-19
	Parihar et al. [52]	Literature review based on historical data	Global	Spanish Flu and COVID-19
	Wilder-Smith and Freedman [53]	Qualitative; perspective and reviews	–	COVID-19

positioning, including how the image was described and categorized within the digital collection. This systematic coding approach enabled careful comparison across historical periods while distinguishing between descriptive observation and rhetorical interpretation (Annex 1).

The comparative analysis examined shifts in rhetorical authority, communicative style, technological mediation, and representations of collective versus individual experience.

The objective was not to determine the success of public health interventions but to analyze how archival curation and visual presentation contribute to the construction of pandemic narratives across different technological and institutional environments.

4 Findings of semi-systematic review

The findings of the review highlight the number of practices and responses on various aspects of the 1918 Spanish Flu and COVID-19 pandemics, synthesize findings and methods of each study, with the following five sub-themes emerging: public health measures and responses; social and cultural responses; media representation, communication, and terminology; uneven impact of pandemics on different regions and social groups; and archival practices and analysis in pandemics (Table 1). Each theme draws on historical and contemporary studies to provide a comprehensive understanding of both pandemics. These insights and methodologies offer valuable frameworks for comparative analysis, highlighting the enduring impact of pandemics on public health, society, media, and historical memory.

4.1 Public health measures and responses

Pandemic responses have consistently sought to curb transmission while navigating societal dynamics. Four articles examine the responses of public health authorities and societal behaviors during the Spanish Flu and COVID-19 pandemics, highlighting the intersection of government actions, cultural influences, and religious roles. These studies also analyze how public health measures were implemented and how societies responded to these crises. For example, Tambolkar et al. [3] conducted a comparative analysis of the Spanish Flu and COVID-19, underscoring both parallels and advancements. Measures such as social isolation and mask-wearing were central to both pandemics, but technological innovations like contact tracing apps were unique to COVID-19. This study illustrates the evolution of pandemic responses, though enforcement remained a persistent challenge across both events. Minenko [35] also explored the enforcement of mask mandates in Calgary and Edmonton during the Spanish Flu, revealing public resistance to government directives. Similarly, Alexander [36] noted that Mexican authorities struggled to enforce health measures during the Spanish Flu, in part due to cultural perceptions that viewed the pandemic as divine punishment. These issues echo the resistance observed during COVID-19 in various regions, where enforcement difficulties were widespread.

Bambra et al. [37] challenge the notion that public health interventions were consistently effective during the Spanish Flu. They argue that although measures, such as mask mandates and social distancing were introduced, they were inconsistently applied and largely ineffective in curbing the virus's spread. This study contrasts with Tambolkar et al. [3], who highlight improvements in public health strategies during COVID-19 but agree that enforcement challenges persisted in both pandemics. Bambra et al. [37] also point out that the limited scientific understanding of influenza transmission during the Spanish Flu led to inadequate measures, while, despite advancements in knowledge and technology, compliance and enforcement remained issues during COVID-19.

4.2 Cultural and societal responses

Only three articles illustrate societal and cultural responses to public health measures and social norms. For example, Adams and Kopelman [20] examined how COVID-19 was memorialized through photography and social media, reflecting collective efforts to process the pandemic impact. Casey et al. [54, 55] highlighted the disruption of women's lives during COVID-19, particularly about domestic labor and healthcare access, underscoring how pandemics exacerbate existing social inequalities. This exploration of societal roles provides a useful lens for comparing the impact of the two pandemics. Religious institutions also played a significant role in shaping responses. Kildea [38] discussed how the Catholic Church in Sydney initially resisted public health mandates during the Spanish Flu but ultimately complied.

In contrast, during COVID-19, religious institutions adapted more quickly, leveraging technologies such as virtual worship, signaling a reduced influence of traditional religious authority on public health matters. Religious leaders and communities in countries like Italy and the United States often viewed the pandemic as divine punishment, which hindered the adoption of measures like mask-wearing and social distancing (Spinney [56]; Berg et al, [57]). This study also contrasts with the COVID-19 pandemic, where, as Novaes [39] noted, the diminished influence of religious institutions and the use of technology-facilitated greater adaptability, including virtual worship and online community engagement. Moreover, some religious institutions continued to resist public health recommendations during COVID-19, reflecting a continuity of challenges from earlier pandemics.

4.3 Media representation, communication, and terminology

Eight studies related to the role of the media, risk communication, and the use of terminology during both pandemics have shown how media coverage influenced public perception and how terminology evolved to communicate health information. The role of media in shaping public perception during pandemics cannot be overstated. Media coverage has historically influenced how the public understands and reacts to health crises, as explored in several comparative studies. For example, Edwards [24] analyzed Spanish media coverage of both the 1918 Spanish Flu and COVID-19, uncovering recurring themes such as the origins of the virus, transmission, symptoms, and treatments. However, a key finding was that early media reports in both pandemics downplayed the severity of the virus, which contributed to delayed public and governmental responses. However, Barnett [40] noted that, particularly in Canada, sensationalism was used in early coverage, which led to anxiety and discrimination against minority communities such as Spanish immigrants during the Spanish Flu, and later, Asians during the COVID-19 pandemic.

In addition, Ding and Pandya [41] extended this analysis by exploring how COVID-19 was framed in the Indian media, particularly in The Times of India's online publications. They noted the emphasis on risk as a quantifiable public health concern and a socially constructed concept shaped by cultural and experiential factors. Media's portrayal of risk in pandemics plays a significant role in shaping how the public perceives the threat and their responses to it, further emphasizing the media's role in influencing societal behavior. Another study by Ogbodo et al. [42] found that media framing varied significantly across countries. For example, the media in Nigeria placed more emphasis on

misinformation, while other countries, such as Germany, maintained a focus on science-based reporting.

The stigmatization of foreign nations and communities, driven by media narratives, has also been a recurring issue. Hoppe [43] argues that media coverage often evolves from fearmongering to focusing on safety, but not before certain groups are scapegoated for the spread of disease. During the Spanish Flu, countries like Spain and France were blamed, while in the case of COVID-19, China was frequently singled out, contributing to xenophobia and discrimination. Similarly, a study by Budhwani and Sun [44] highlighted that Asian communities faced a wave of stigmatization during the COVID-19 pandemic, exacerbated by the media's frequent association of the virus with China.

Moreover, the evolution of language and terminology during pandemics provides insight into how public understanding is shaped by communication strategies. For example, Lanza et al. [45] conducted a semantic analysis of the terminology used in media and scientific reports during the Spanish Flu and COVID-19. They identified common terms such as "contagion" and "restrictions," but also highlighted the role of digital technologies during COVID-19 in shaping new terms like "smart working" and "distance learning." This evolving language reflects broader societal changes and how pandemics are communicated across different eras. Rovetta and Bhagavathula [46], for example, explored the surge of COVID-19-related terminology in scientific publications, highlighting how rapidly the global health lexicon changed during the pandemic, particularly in the context of online and digital spaces.

4.4 Uneven impact of pandemics on different regions and social groups

The discussions on the uneven impact of pandemics on different regions and social groups, focusing on health disparities, gender inequalities, and the broader socioeconomic and political effects of pandemics are found in five articles. These studies have shown how pandemics have consistently exposed and exacerbated existing inequalities, both on regional and societal levels. For example, Bambra et al. [37] examined the stark regional disparities in mortality rates during the Spanish Flu in England and Wales. Their study found that factors, such as deprivation, working conditions, urbanization, and overcrowding contributed to a north–south and urban–rural divide, with the most vulnerable populations suffering the worst outcomes. This historical analysis sheds light on how structural inequalities influence pandemic experiences and outcomes. The economic disparities were exacerbated by the Spanish Flu in Spain, revealing that more economically developed urban areas faced fewer deaths compared to poorer rural regions [58]. This was due to differences in health infrastructure, economic resilience, and social mobility, highlighting how pandemics disproportionately affect less developed areas.

During the COVID-19 pandemic, these inequalities became even more pronounced. Casey et al. [54, 55] explored how the pandemic deepened gender inequalities, especially for women involved in unpaid domestic labor and those facing restricted access to healthcare. Women, particularly in frontline jobs like caregiving and healthcare, bore the brunt of the crisis, shouldering additional responsibilities while experiencing higher rates of job loss. Hupkau and Victoria [47] extended this by investigating gender inequality in Spain during COVID-19, showing that the disproportionate economic burden fell on women working in sectors most affected by lockdowns, such as retail and hospitality. School closures also magnified childcare responsibilities, limiting women's

participation in the labor force and pushing many into precarious economic positions. These findings echo historical patterns, as pandemics like the Spanish Flu also marginalized women, though in different ways. For example, women's labor increased in wartime industries,however, they were often excluded from economic decision-making.

Socio-economic implications of pandemics extend beyond health disparities, influencing political and economic strategies globally. Palen [48] explored how the COVID-19 pandemic spurred a rise in protectionist and nationalist policies, paralleling the isolationist responses seen during the 1918 Spanish Flu. The shift from globalism to nationalism illustrates how pandemics can trigger a reevaluation of economic policies, with countries prioritizing internal security over international cooperation. This was evident as many countries have imposed travel bans, border controls, and prioritized domestic supply chains, causing ripples in the global economy. These shifts reflect not only an immediate health crisis response but also a longer-term change in global political ideologies.

At the same time, pandemics widen socioeconomic disparities within countries. Bambra et al. [49] argue that pre-existing inequalities, such as poverty and lack of access to healthcare, worsened during COVID-19, with the virus hitting poorer regions and marginalized communities harder. In many cases, those working in low-income jobs, particularly without access to remote work options, were disproportionately exposed to the virus. In countries like India, Sharma et al. [50] noted that both the Spanish Flu and COVID-19 worsened socio-economic inequalities. India's lower classes, already marginalized due to caste and economic hierarchies, faced even greater challenges during these pandemics, including inadequate healthcare and economic support. Such crises also strained government resources and exacerbated wealth disparities, as the rich could afford better medical care and insulation from the virus while the poor struggled to access even basic health services.

4.5 Archival practices and analysis in pandemics

Archival practices during the 1918 influenza pandemic were largely institution-driven and centralized, where government agencies, hospitals, and print media preserved documentation, resulting in a top-down archival structure (Spinney 2017). In contrast, the archival practices during the COVID-19 pandemic were participatory and decentralized, where nonprofit institutions, universities, and community organizations played a significant role. While archival records during the 1918 influenza are fragmented and uneven, with significant gaps in personal and community-level experiences, COVID-19 archives are shaped by real-time documentation enabled by digital technologies, such as social media platforms, blogs, and online repositories [20, 51],Zannat et al., 2024). In terms of materials preserved, archives of earlier pandemics were text-based, such as public health reports, mortality statistics, newspaper coverage, or diaries (Spinney 2017). In addition to traditional records, the COVID-19 archives are characterized by an abundance of multimodal materials, including social media posts, digital photographs, videos, memes, data dashboards, and oral story telling [20, 44, 59, 60]. Moreover, the paper-based records and physical artifacts have transformed to predominantly digital or technology-based data storage and platforms.

The existing archival research on health pandemics highlights the role of photography in contemporary cultural memory, with a critical examination of how photographs

are selected, curated, and labeled. The studies argued that citizens' writing repositories, as sources of personal and emotional experiences during health crises, have become a focus of both archival and historical scholars. For example, Gourley's [51] study of the emotional experiences of Australians during the COVID-19 pandemic illustrates how personal writing repositories, such as the Diary Files project, provide an intimate view of daily life during the crisis. This approach brings forth the argument that personal accounts and reflections offer a more authentic, uncensored narrative of pandemics, in contrast to the more polished, institutionalized records. In addition, Greenwood [26] also emphasized the need to document underrepresented groups during pandemics, particularly marginalized communities whose experiences are often left out of mainstream narratives. This concern was also echoed by Hoppe [43] and Platt et al. [61], who both argue that pandemics tend to worsen social inequalities and lead to the marginalization of certain groups, whether through stigmatizing labels or disproportionate impacts on marginalized communities, such as sex workers. The tension between inclusion and exclusion in archival practices raises significant questions about whose voices are preserved and whose experiences are considered worthy of documentation. Such tension connects to a broader critique of archival processes, where power dynamics and institutional biases influence what is deemed "archivable."

Moreover, the role of public health interventions and control measures during pandemics is a recurring theme in historical literature. Parihar et al. [52] analyzed the history of pandemics, arguing that non-pharmaceutical measures, such as quarantining and mask-wearing, have historically played a critical role in curbing the spread of diseases. Wilder-Smith and Freedman [53] also argued that in modern pandemics, such as COVID-19, the global mobility of populations due to international travel complicates the implementation of traditional control measures. This argument expands the discussion to include structural factors such as globalization and urbanization, which not only exacerbate pandemics but also influence how they are archived and remembered. As scholars continue to debate how best to document diverse experiences, both personal and institutional archives play complementary roles in preserving the memory of pandemics, each offering unique perspectives that contribute to the collective understanding of these crises.

5 Key findings from visual rhetorical analysis

The visual rhetorical analysis examined photographs and digital materials preserved in the U.S. National Archives and the Texas Woman's University (TWU) COVID-19 Digital Collection. The findings are organized under six thematic categories: (1) health advisories using language, tone, and expression; (2) large public events; (3) artifacts; (4) quotidian lives during the 1918 influenza pandemic; (5) healthcare settings; and (6) special items collected during both pandemics.

5.1 Theme 1: health advisories using language, tone, and expression

The advisories preserved in the TWU COVID-19 collection and those archived by the U.S. National Archives from the 1918 Spanish influenza pandemic display observable differences in language, tone, and visual composition. The COVID-19 advisories frequently employ specific, action-oriented phrases such as "Wear appropriate face covering" and "Maintain social distance." Several materials address readers directly, using expressions

such as "Dear TWU community" and statements framed as commitments, including "I promise to." Visually, these materials often incorporate graphic icons, color contrasts, and digital features such as QR codes that link additional institutional resources.

In contrast, the 1918 influenza advisories rely more heavily on imperative language, including instructions such as "Spitting must be prohibited" and "Coughers and sneezers must cover their faces." The tone is predominantly directive. The visual layout of these materials is largely text-based, with limited graphic elements and reliance on bold lettering for emphasis.

Both sets of advisories aim to promote disease prevention, though they differ in textual formulation and visual presentation.

5.2 Theme 2: large public events

The archival collections include images depicting large public gatherings during both pandemics. One image from the TWU collection documents a Black Lives Matter protest during the COVID-19 pandemic. Participants are shown wearing face masks while holding signs advocating racial justice. The image captures a mass public demonstration occurring alongside ongoing public health restrictions. In contrast, a photograph preserved in the National Archives documents the Liberty Loan Parade in New York City during World War I, which took place amid the 1918 influenza outbreak. The parade shows dense crowds gathered in public space to support wartime bond efforts. Both images depict large gatherings occurring during periods of active viral transmission. The National Archives' image emphasizes a nationally organized event linked to wartime mobilization, whereas the TWU image captures a grassroots protest reflecting contemporary social movements.

5.3 Theme 3: artifacts

The collections also preserve artifacts reflecting social responses to each pandemic. In the TWU collection, a handwashing embroidery created during the COVID-19 pandemic emphasizes hygiene practices through artistic representation. The embroidery integrates public health messaging into a handcrafted object. In the National Archives collection, a photograph documents toys made by children during the 1918 influenza pandemic to support war refugees. The toys reflect efforts by American children to contribute to broader wartime and humanitarian initiatives. Both artifacts illustrate creative responses during periods of crisis photographs capture sizes hygiene practices during COVID-19, while the 1918 toy-making photograph captures charitable engagement amid war and pandemic conditions.

5.4 Theme 4: quotidian lives during the 1918 influenza pandemic

Photographs from the National Archives provide insight into how civilians adapted daily life during the 1918 influenza pandemic. One image depicts an outdoor classroom at the University of Montana, illustrating educational adjustments intended to reduce viral transmission. Another photograph shows barbers wearing masks while serving customers, reflecting modifications to business practices. Additional images document women serving as conductors and clerks while wearing masks, as well as a letter carrier in New York City continuing postal duties during the outbreak. These photographs collectively depict adaptations across education, labor, and essential services during the pandemic.

The images illustrate efforts to maintain continuity of daily activities while incorporating protective measures.

5.5 Theme 5: healthcare settings

Images from both pandemics document healthcare environments under strain. The 1918 photographs archived by the National Archives depict temporary field hospitals, crowded wards, and organized medical personnel responding to influenza outbreaks. Some images show military vaccination efforts and protective practices among soldiers. In contrast, the TWU collection includes an image of a frontline healthcare worker during the COVID-19 pandemic wearing advanced personal protective equipment, including a face shield and mask. This image emphasizes an individual healthcare provider in a contemporary medical setting. The archival materials from 1918 highlight large-scale mobilization and collective medical response, while the COVID-19 image documents a healthcare worker operating within modern protective protocols.

5.6 Theme 6: special items (1918 influenza and COVID-19)

The TWU collection includes self-interviews, oral history transcripts, personal journals, children's drawings, and reflective letters documenting experiences during the COVID-19 pandemic. These materials capture personal accounts of lockdowns, social distancing, emotional responses, and disruptions to daily life. For example, one image depicts a young girl leaning on a fence, visually representing physical separation. A child's drawing portrays a fractured world, while a photograph of a theater marquee reading "A Brief Intermission" documents the temporary closure of public venues. A personal letter from a student and mother provides narrative insight into the challenges of managing family responsibilities during the pandemic.

By contrast, personal narrative materials from the 1918 influenza pandemic are less systematically preserved within the National Archives collection. The 1918 materials are predominantly institutional or military in nature, with fewer examples of individual reflections or personal documentation.

6 Discussion

The comparative analysis of the 1918 influenza and COVID-19 archival materials reveals important shifts in how pandemics are documented, framed, and remembered. While both pandemics generated visual records related to public health advisories, healthcare settings, daily life adaptations, and large public events, the archival structures through which these materials are preserved shape their interpretive significance. One of the most prominent differences concerns rhetorical authority. The 1918 materials preserved within the U.S. National Archives predominantly reflect institutional and governmental perspectives. Many of the images document military mobilization, official health advisories, organized vaccination efforts, and state-directed responses. Visual framing emphasizes collective compliance and centralized authority. This institutional orientation is consistent with archival scholarship demonstrating that state archives often privilege governmental narratives and administrative documentation [15].

By contrast, the TWU COVID-19 Digital Collection foregrounds participatory documentation. Personal reflections, oral histories, children's drawings, and self-submitted artifacts are prominently featured. The inclusion of self-interviews and personal

testimonies expands the archival record beyond formal institutional documentation. Rather than exclusively documenting governmental response, the collection captures lived experience, emotional expression, and individual adaptation. This participatory dimension reflects broader shifts in archival practice toward inclusivity and community engagement, as documented in recent scholarship on COVID-19 archiving [26, 28].

Technological mediation further distinguishes the two archival contexts. The 1918 materials are preserved as digitized photographs of originally analog artifacts, often accompanied by brief descriptive metadata. In contrast, the TWU collection exists as a born-digital archive, incorporating interactive interfaces, embedded links, and digital submission mechanisms. These infrastructural differences influence not only accessibility but also the way meaning is framed. Digital interfaces enable layered contextualization and searchable metadata, shaping how users encounter and interpret archival materials.

The analysis also reveals differences in tone and communicative framing. The 1918 health advisories employ imperative language consistent with command-based public health messaging. COVID-19 advisories in the TWU collection, while still directive, frequently incorporate collaborative phrasing and community-oriented appeals. These differences reflect evolving norms in institutional communication, where public health messaging increasingly integrates relational language and digital interactivity.

The theme of large public gatherings illustrates additional complexity. The Liberty Loan Parade photograph documents mass mobilization within a wartime national context, while the Black Lives Matter protest image from the TWU collection captures civic activism occurring alongside pandemic restrictions. Both images depict public assembly during viral outbreaks; however, the archival positioning of these events differs. The 1918 image is situated within national wartime mobilization narratives, whereas the COVID-19 protest image intersects public health crisis with contemporary social justice movements. These intersections demonstrate how archival collections mediate not only health narratives but also broader sociopolitical contexts.

Importantly, the contrast between institutional and participatory archives also raises questions of visibility and exclusion. The National [7] influenza materials largely center military and governmental documentation, with comparatively limited preservation of marginalized voices or personal accounts. In contrast, the TWU collection intentionally solicits community contributions, thereby expanding representation. Nevertheless, digital participation is itself shaped by access to technology, institutional affiliation, and digital literacy. Thus, while participatory archives may broaden inclusion, they do not eliminate structural inequalities in whose experiences are documented and preserved. Archival scholarship has long emphasized that selection and preservation practices reflect broader power structures [15], and this dynamic remains visible across both pandemics.

Moreover, these findings demonstrate that digital archives do more than store historical evidence; they actively structure the narratives through which pandemics are remembered. Institutional archives tend to foreground centralized authority and collective mobilization, whereas participatory digital archives center lived experience and affective memory. Technological infrastructures further mediate how these materials are encountered and interpreted. By comparing archival representations across two

pandemics separated by more than a century, this study highlights the evolving relationship between public health communication, archival practice, and collective memory.

7 Conclusion

The comparative analysis of the 1918 influenza pandemic and the COVID-19 pandemic demonstrates that pandemics are not only biological crises but also communicative and archival events. Through the examination of digital archival materials preserved in the U.S. National Archives and the Texas Woman's University (TWU) COVID-19 Digital Collection, this study has shown that archival practices shape how pandemics are framed, interpreted, and remembered across historical contexts.

The findings indicate that the 1918 influenza materials emphasize institutional authority, collective mobilization, and state-centered documentation. In contrast, the COVID-19 materials curated by TWU foreground participatory contributions, lived experience, and affective memory. These differences reflect not only historical shifts in communication practices but also transformations in archival infrastructures and digital technologies. Whereas the 1918 materials were produced and later digitized within institutional frameworks, the COVID-19 archive exists as a born-digital environment that enables community submission, interactive engagement, and expanded representation.

Importantly, these archival differences influence collective memory. Institutional archives tend to privilege governmental and administrative narratives, while participatory digital archives broaden the scope of documentation to include personal and community experiences. However, the expansion of digital participation does not eliminate inequalities in archival visibility. Access to digital platforms, institutional affiliation, and technological literacy continue to shape whose experiences become part of the permanent record. In this sense, digital archives do not simply preserve history; they actively mediate the interpretive frameworks through which societies understand health crises.

From a practical perspective, these findings suggest that future public health crisis management should consider archival strategy alongside medical preparedness. Inclusive and participatory documentation practices may enhance collective resilience by preserving diverse experiences and enabling broader public engagement with crisis narratives. Archival institutions can play a proactive role in ensuring that pandemic records reflect multiple perspectives, particularly those of communities that may otherwise be underrepresented. At the same time, institutions must remain attentive to structural inequalities that influence whose voices are documented and whose remains are absent.

Moreover, the comparison of pandemic archives reveals a transition from a centralized, retrospective, and institutionally controlled practices to decentralized, real-time, and participatory approaches. The contemporary archival practice during COVID-19 expands inclusivity, captures a broader range of experiences, and introduces new complexities related to scale, ethics, and preservation. These differences underscore the importance of situating archival practices within their broader technological and social contexts, as they fundamentally shape how pandemics are remembered, studied, and understood over time.

This study has several limitations. First, the analysis focuses on two United States–based digital archives, which limits the geographical scope of comparison. The findings therefore reflect archival practices within a specific national and institutional context and may not fully represent global archival responses to pandemics. Archival initiatives

in other regions, particularly in the Global South, may operate under different technological, institutional, and cultural conditions. The concentration on U.S.-based collections may thus reproduce broader geopolitical patterns in which Western institutions disproportionately shape global pandemic memory. Second, the analysis centers on visual and digital materials available through publicly accessible platforms. Other forms of documentation, including non-digitized materials and community records outside formal institutional archives, were beyond the scope of this study. This methodological focus underscores how digitization and platform accessibility influence which materials become visible to researchers and the public.

Finally, although the semi-systematic review followed structured search and screening procedures, it was limited to English-language publications and articles published between 2018 and 2023. Relevant scholarships in other languages or earlier historical studies may therefore not have been included. These constraints highlight how linguistic and temporal boundaries shape academic knowledge production. Taken together, this study underscores that digital archives function as active mediators of crisis narratives. By comparing archival representations across two pandemics separated by more than a century, the research demonstrates how evolving technological infrastructures and archival philosophies shape the rhetorical construction of public health events. Recognizing this mediating role is essential for developing archival practices that promote transparency, inclusivity, and informed public memory in future global emergencies.

Annex 1: Coding matrix of visual rhetorical analysis

This matrix operationalizes six thematic categories derived from the visual rhetorical analysis of pandemic-era photographs and digital materials preserved in the U.S. National Archives and the Texas Woman's University (TWU) COVID-19 Digital Collection. Each category includes an operational definition, observable visual indicators, and a concrete application example.

Category/code	Operational definition	Observable indicators/elements	Examples
Theme 1: Health Advisories (Language, Tone & Expression)	Safety promotion and behavior guidance through textual and visual health communication elements advised by public health organizations in times of a pandemic	Officially issued signage with precautionary advisories (e.g., mask up, social distance); Use of authoritative/imperative language; Officially issued signage with precautionary advisories (e.g., handwash, stay home, mask up, social distance); Inclusion of institutional logos; Categorizing risk using Color codes (red/yellow); and Choice of font size, boldness, and upper cases for texts;	"Spitting must be prohibited"; "Coughers and sneezers must cover their faces with handkerchiefs"; "I promise to wash my hands frequently with soap and water or use hand sanitizer"; and "SAFETY FIRST"
Theme 2: Large Public Events	Public gatherings – formal or informal that ignored public health advisories during the pandemic	Rally, procession, or demonstration by a large crowd; Use of banners, posters, placards, flags, and protest signs; Evidence of not adhering to health precautions; Patriotic vs. civil-rights iconography; and Media presence (e.g., journalists with cameras and booms)	The 1918 Liberty Loan Parade (patriotism-driven mass gathering) and the 2020 BLM protests highlight the enduring power of collective actions amid global crisis over public health advisories

Category/code	Operational definition	Observable indicators/elements	Examples
Theme 3: Artifacts	Symbolic materials or objects reflecting the coping strategies, community feelings, and cultural values during the pandemic period	Handcrafted or embroidered craftsmanship manufactured during the pandemic; Folk art and aesthetic creations representing cultural norms and values; and Charity, refugee inclusion, or community service via the use of functional or decorative items;	Embroidered reminders of hygiene during COVID-19; and Handmade toys that were crafted during the 1918 Spanish flu for war refugees
Theme 4: Quotidian Lives (Spanish Flu)	The adaptation and/or disruption of ordinary people's routine lives during the 1918 influenza pandemic	Wearing masks in everyday activities; Continued activity in open air or outdoor settings, substituting indoor settings; Adjusting and performing professional practices in alternative ways; Transforming educational, laboratory, scientific work, and healthcare settings; and	The depiction of masked postmen delivering mail; Academic classes taking place in the open air; and Barbers, nurses, and employees of a scientific lab continued providing service wearing masks
Theme 5: Public Healthcare Settings (Spanish Flu)	An overarching situation of healthcare service, including medical, clinical, and emergency services, during the 1918 Spanish Flu	Identity markers of healthcare professionals (e.g., uniforms, PPE, masks); and Operating field hospitals, Red Cross in civilian spaces	Field hospitals, converted Red Cross facilities, and modern front-line workers exemplify the evolution of healthcare responses during pandemics
Theme 5a: Military Healthcare Settings (Spanish Flu)	The portrayal of the healthcare services in military facilities emphasized preventive measures during the 1918 pandemic	Hospital ward arrangements for military personnel; Vaccine administration settings; Compliance with the public health advisories; and Efforts to combat the pandemic	Soldiers taking vaccines in the military hospitals; Military personnel march wearing masks; and Gargling drills of soldiers
Theme 6: Special Items – Personal Documentation (COVID-19)	Personal materials developed and directly used by individuals to share their lived experience and how they navigate COVID-19 as a crisis	Journal writing of individuals, either handwritten or typed; Transcribed version of a recorded oral history with first-person voice; and Digital Collections of pandemic experiences	A TWU student's oral history transcript and personal journal capture firsthand experiences, reflections, and emotions during the COVID-19 era, preserving a unique perspective on a historic global event
Theme 6a: Special Items – Creative & Environmental (COVID-19)	Non-traditional, symbolic, and visual documents representing pandemic experience through an artistic, imaginative, or creative lens	Artworks depicting pandemic themes; Symbolic photographs; Visual metaphors emphasizing isolation and social distancing; and Emptiness in typically crowded spaces	A child's imaginative depiction of a world in chaos; The sun peeping behind the cloud symbolizes hope or optimism for a normal life; and "A Brief Intermission"

Sources U.S. National Archives (1918 Spanish Influenza); Texas Woman's University COVID-19 Digital Collection

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Declarations

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Consent for publication
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