# Visualization of Data Journalism of China's Mainstream Media in Public Health Emergences: Taking the Data News Section of Xinhua Net as An Example

# Visualization of Data Journalism of China's Mainstream Media in Public Health Emergences: Taking the Data News Section of Xinhua Net as An Example

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**Abstract.** In the context of Chinese media, the practice of data news visualization during the COVID-19 pandemic presents unique characteristics. In order to explore the visualization mode of China's data news reports during the epidemic, this article uses the method of content analysis to analyze the data news reports related to the epidemic released by the data news section of Xinhua Net from January 22, 2020 to October 26, 2020. The article discussed the innovations in the application form and narrative characteristics of China's mainstream media visualization practice from three aspects, and proposed improvements to the deficiencies. The research found that the data news related to the epidemic focus on data analysis in terms of production methods, and use simple and easy-to-understand diagrams for visual design, and use both traditional and advanced infographics; but it also reflects a lack of the richness of data source, mainly including static information charts and insufficient interactivity.

## 1. Introduction

The widespread application of information technology has brought profound changes in various fields of human society. It not only promotes the application of technology to improve the quality of human life, but also shapes people's living habits and ways of thinking. As Negroponte said in *Being Digital*, "computing is no longer just related to the computer, it determines our survival."

The advancement of information technology drives the development of news practice and theoretical research. In the era of big data, the reporting methods of data journalism broke through the traditional news narrative mode and gradually formed its own application form and narrative characteristics during the practice.

In December 2019, unexplained pneumonia cases were discovered in Wuhan, Hubei Province. Subsequently, all parts of the country carried out joint prevention and control to contain the spread of the epidemic. Spreading the knowledge of pandemic prevention, propagating anti-epidemic actions, and strengthening confidence in the fight against the epidemic have become the important tasks of the Chinese media, especially mainstream media.

Xinhua Net is a comprehensive news information service portal, hosted by Xinhua News Agency, the national news agency of China. It is the most influential online media in China with global influence. It is responsible for gathering public opinion and information. As one of China's most influential mainstream media, Xinhua Net has published a total of 62 reports related to the epidemic in its data news section during the critical stage of China's fight against the COVID-19 pandemic. Using it as a

sample, this article attempts to analyze the innovations in application forms and narrative features of data news released by mainstream Chinese media during the anti-epidemic period.

## 2. The role of media in public health emergencies

During the sudden break out of public health emergencies, mainstream media are required to respond quickly, accurately reporting the epidemic-related information as soon as possible. Mainstream media should also popularize the knowledge of epidemic prevention to eliminate rumors, guide public opinion, and avoid unnecessary public panic.

In addition to ensuring the public's right to know, mainstream media also have the responsibility to guide people to fight against the epidemic. With the development of Internet technology, the public will actively exchange and share information in the face of disasters [1]. In China, information basically comes from official channels. If mainstream media can increase the frequency of reporting and broaden the scope of information source regarding the developing trend of the epidemic, the public's attention to the related topics will be effectively increased, making personal agenda setting more consistent to the media agenda setting, guiding the whole people to prevent the epidemic.

## 3. Digitization, visualization and data journalism

Data are quantitative facts, which can present objective existence neutrally and accurately. There are many external manifestations of data, such as symbols, text, numbers, voice, images, videos, etc. The information can be presented through these different carriers. Specifically in news production, open and published data can help the public to better understand the truth and reality of specific events [2]. At the same time, the data can convince the public due to its objectivity and neutrality.

News visualization is a new form of news reporting, integrating modern information technology, data production and visualization production[3]. In the era of converged media, fixed linear news reports, single text reports and even graphic reports can no longer meet the needs of the audiences. The visualization of data news can just make up for this shortcoming. It can not only intuitively express the news content, but also highlight key points through elements such as icons and colors to help audiences obtain key information in the news.

The development of data journalism is inseparable from the advancement of technology. Data journalism is a new method of news reporting based on data capture, mining, statistics, analysis and visualization, and the core of it is the processing of data[4]. Xiangdong Xu proposed that the narrative of data journalism is to tell news stories through the analysis, screening, and organization of data. This process is actually the process of reconstructing narrative discourse[5]. It is not difficult to see that the definition of data journalism by scholars has paid a lot attention to its innovation in news reporting.

During the outbreak of the COVID-19 pandemic, the data news launched by the Chinese media quickly spread the latest worsening trend of the epidemic on social media in an intuitive way, and made data news more readable and interesting by using the form of vivid data expressions. It also popularizes epidemic prevention knowledge in an easy-to-understand way, effectively enhancing the public's awareness of scientific epidemic prevention.

## 4. Methods of the research

### *4.1. Content Analysis method*

This article uses content analysis method to analyze the reports related to the COVID-19 pandemic released by the Xinhua Net data news section during the outbreak of the epidemic in China. As a quantitative research method for systematic and objective description, content analysis is suitable for describing the basic characteristics of the data news.

### *4.2. Sample description*

According to the White Paper "China's Action to Fight the New Coronary Pneumonia Epidemic", from January 20 to May 31, China's anti-epidemic operations experienced four important stages: "containment of the spread of the epidemic", "the number of new local cases gradually decreased to

single digits", "achieved decisive results in the defense of Wuhan and Hubei" and "national epidemic prevention and control has entered normalization". After that, there was a slight rebound in cases in some areas, mainly manifested in the newly confirmed cases notified by Beijing on June 11. As of July 19, Beijing achieved 13 "zero" new cases.

Therefore, the scope of this research is from January 22, 2020 on the eve of Wuhan's lockdown to October 26, 2020, the last data news related to the epidemic was released on the Xinhua Net data news section.

The mainstream media is the front for news reports and public opinion propaganda, and the content of its report can reflect the public opinion orientation during the epidemic. The mainstream media reports reflect the key process of China's anti-epidemic action. Selecting the content of the reports during this period as the research objects can make the research results more objective and true.

### *4.3. Category construction*

The category construction of this research was mainly divided into three parts: production content, production methods and visual design, as Table 1 shows. In terms of visual design, it is divided into three categories: visual elements, information graph application and interactive design.

**Table 1.** This research mainly divides the categories of content analysis into three parts.

| Parts | Description |
|---|---|
| Production content | Data Sources, subject and scope of the topic, descriptive words |
| Production methods | Digital expression, data analysis |
| Visual design | Visual elements, infographic application, interactive Design |

Diagrams, illustration icons, visual decorations and animation effects are used as the visual elements in the data news. Visual decoration refers to the use of lines or graphics to change the appearance of the information. The animation effect is embodied in dynamic pictures that integrate static pictures to make them "moving", so as to better observe the trend of the epidemic.

The information graph embodies the ability to integrate and express data, and is also the most widely used visual expression tool in the visualization design process of data news. Information charts are roughly divided into relationship diagrams, flowcharts, maps (heat maps), timelines, bubble charts, histograms, pie charts and scatter charts. The main infographics used in the data news include traditional infographics (bar, line, bar, pie, etc.) and advanced infographics (word cloud, bubble chart, etc.).

## 5. Research results

According to the statistics, from the eve of Wuhan's lockdown on January 22, 2020 to October 26, 2020, a total of 62 reports related to the COVID-19 epidemic were released by the Xinhua net data news section.

### *5.1. Data source: strong authority, but insufficient richness*

The sources of data news about the epidemic released by the data news section of Xinhua Net are Xinhua News Agency and Xinhua Net, other mainstream media, government departments, enterprises and publishing houses, and an unknown source of data, respectively accounting for 11%, 5% , 78%, 3%, 1% and 2%, as shows in Figure 1. It can be seen that the government accounts for most of the sources of data in the news section of Xinhua Net. The data are authoritative, but the richness of the data sources is slightly insufficient. In particular, only 3 of the 62 data news articles came from companies and publishing houses, indicating that the cooperation between Xinhua Net's data news section and non-mainstream media platforms is not deep enough, and most data depends on government departments and the media.

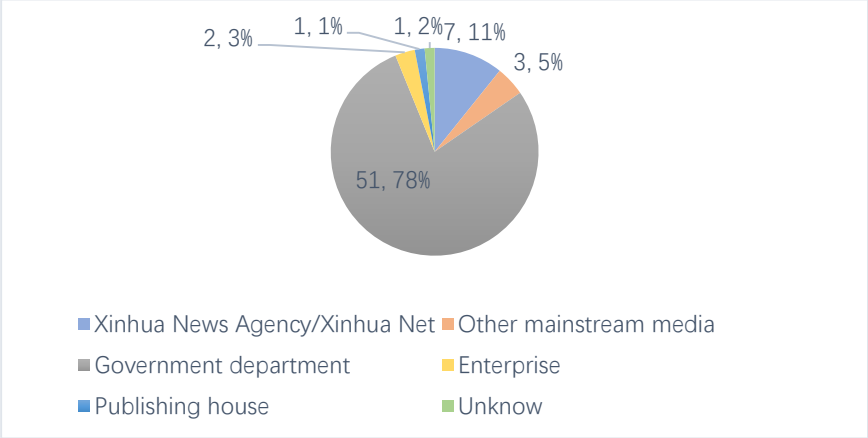


**Figure 1.** The sources of data in the news section of Xinhua Net.

Most of the data news related to the epidemic released by the Xinhua Net Data News column is from a single source, with two sources or more and an unknown source accounting for only 18%, indicating that most of the data sources used by Xinhua net rely on official government data, and mainstream media's ability to use multiple data sources is lacking.

*5.2. The topic selection has a global perspective and pays most attention to the changing trend of the epidemic*

Among the 62 data news related to the epidemic released by the data news section of Xinhua Net, 10 of them paid attention to the changing trend of the international epidemic, accounting for only 16%, which reflects that the data news section of Xinhua Net has a global vision. It indicates the focus of news reports is domestic, and the proportion of international news reports is relatively unbalanced. This reflects the characteristics of Xinhua Net as a mainstream media in China.

Among the types of topics reported by the Xinhua News column, there are 52 epidemic situation reports, accounting for 84%, anti-epidemic actions in China accounting for 14%, and anti-epidemic knowledge accounting for 2%. On the one hand, this reflects the Xinhua Net's data news section's high attention to the development of the epidemic. On the other hand, it reflects the data news has applicability in epidemic situation reports and anti-epidemic actions, while popularizing anti-epidemic knowledge is more suitable to be presented in the form of comics, text, etc.

*5.3. Few descriptive text and more focus on data analysis*

In the statistical sample, 54 articles have texts below 500 words, accounting for 87%. Other data news with 500-800 words and more than 800 words accounted for a relatively small proportion. This shows that when traditional media produce data news, they consciously use numbers to express them instead of describing them in words.

According to the statistical results, 54 of the data news related to the epidemic on the Xinhua Net data news column focused on data analysis, accounting for 87%, while only 8 focused on digital expression, accounting for 13%. This shows that the data news section of Xinhua Net has a clear positioning of data news and its ability to integrate, analyze and interpret data is very strong.

*5.4. Visual design*

*5.4.1. Using simple, easy-to-understand illustrations for visual elements.* As can be seen from Figure 2, the number of illustrations in the four visual elements is the largest, with a total of 50 articles, accounting for 81%, followed by animation effects, a total of 9 articles, accounting for 14%, while illustration icons and visual decorations each account for 2 % and 3%. It can be seen that the data news column of Xinhua Net pays more attention to explaining the trend of the epidemic in a graphical way in the visual design.

This is because the graphic news is easier to produce and more intuitive and understandable in presentation. There are not many applications of animation effects in the Xinhua Net data news section because the production of it requires higher time cost and more professional skills. At the same time, the Xinhua Net data news section has also made innovative attempts to describe news with lines and icons. For example, **Figure 3** *The Number of Beds in Wuhan Fangcang Shelter Hospital* uses different sizes of graphs to indicate the number of beds.

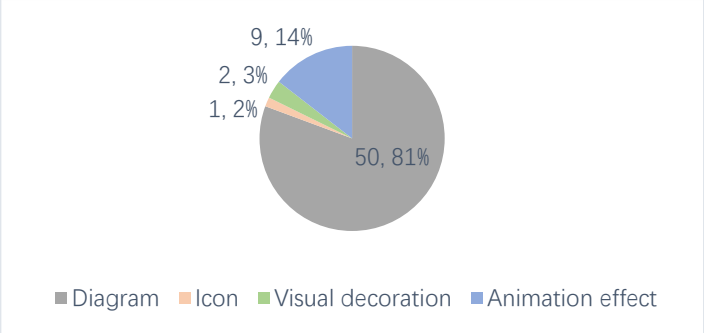


**Figure 2.** Visual elements of the data news.


**Figure 3.** The Number of Beds in Wuhan Fangcang Shelter Hospital uses different sizes of graphs to indicate the number of beds.

*5.4.2. Use both traditional and advanced infographics*. Infographics can extract the most concerned topics from complex information, making the presentation of information more intuitive and easy to understand. Research has shown that 94% of the data news related to the epidemic released by the data news section of Xinhua Net use infographics. As shows in Figure 4, 31 of them use traditional infographics, including tabular bar charts, column charts, line charts, and pie charts. 10 use advanced infographics, such as bubble charts, word clouds, and data maps, while 17 of them combined with both of the traditional and advanced infographic. This shows that most data news reports have analyzed and sorted the data, and selected appropriate interpretation methods based on the characteristics of the data, and they are also relatively skilled in the use of advanced infographics. However, it did not simply pursue the use of advanced infographics, but chose the most suitable way to present data. Therefore, there have been many cases of combining traditional and advanced infographics, and **Figure 5** Sources of People Moving into Beijing After the Spring Festival can be served as an example.

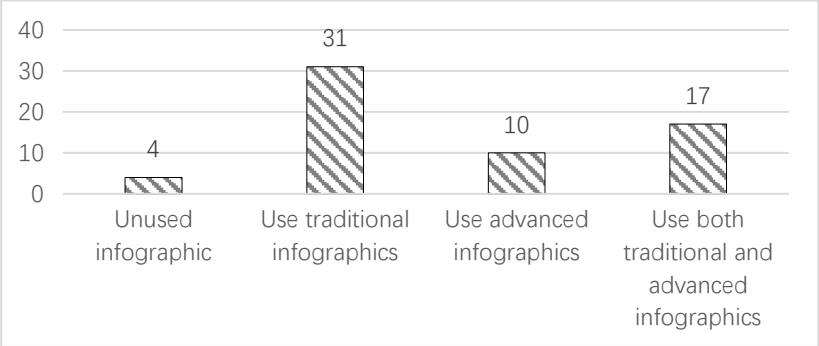


**Figure 4.** Infographic application.


**Figure 5.** Sources of People Moving into Beijing After the Spring Festival.

*5.4.3. Mainly static infographics and lack of interactivity.* Most data news uses static infographics, accounting for 82%, while 18% of news uses dynamic infographics. Most of the visual information graphs are narrative information graphs, which have outstanding advantages in elaborating news and can show the full picture of information in detail. But this kind of chart is too singular, and the interaction with the audience is not strong.

## 6. Conclusion

The data news related to the COVID-19 epidemic released by the data news section of Xinhua Net can follow the changing of the epidemic in a timely manner. The data source has strong authority, and the topic selection has a global perspective, too. Meanwhile, it pays the most attention to the trend of the epidemic. Using digital descriptions and explanations instead of lengthy texts. The reports also pay attention to data analysis, and use simple and easy-to-understand diagrams in visual design, while traditional and advanced infographics are also involved. However, it also reflects the lack of the richness of the data source. In response to the above problems, this research proposes the following suggestions to improve the data news of mainstream media in China.

### *6.1. Strengthen cooperation with non-mainstream media and enterprises to enrich the data sources*

The COVID-19 epidemic is a severe emergency, and the data sources used in relevant news reports often come from official government departments, such as the National Health Commission. This is especially reflected in data news reports showing the changing trend of the epidemic. However, for some topics related to the epidemic, such as travel during the epidemic and hot words of public concern, more data from companies and non-mainstream media can be used to enrich data sources. For example, "One Picture to Understand the Hottest Four Words in Beijing Now" has cooperated with Tianyancha(a commercial organization that records the business status of the company) to analyze the number of companies with nucleic acid detection reagents in the business scope, and interprets the location and cost of nucleic acid detection in Beijing.

At the moment when social media is booming, social media platforms contain a large amount of data for mining and refinement. At the same time, paying attention to public opinion on social media platforms also helps mainstream media to produce news reports that are more responsive to public concerns. Therefore, data mining and analysis on social media can also help enrich the data sources.

### *6.2. Use multiple technologies to enhance interactivity*

The data news of Xinhua Net lacks in dynamic information graphics and interactive design. Although static infographics can present information intuitively, they lack interactivity, which makes it difficult to arouse the interest of the audience and reflect the changing of severe emergencies. By using some technologies, such as H5 pages and VR panoramic news, the interest of audience towards data news can be enhanced.

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