



## DATA JOURNALISM IN HEALTH REPORTING IN BANGLADESH: PATTERN OF PRACTICES, IMPEDIMENTS AND PREPARATIONS FOR JOURNALISTS

Anirudha Biswas\* and Md. Uzzal Talukder

*Mass Communication and Journalism Discipline, Khulna University, Khulna 9208, Bangladesh*

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### Abstract

Data journalism, with its ability to provide macro and micro-scale perspectives on health care, redefined health reporting during the global COVID-19 pandemic. Under these circumstances, health has taken the place of high significance. Consequently, the curiosity to see how data journalism is exercised while covering health issues in Bangladesh led to the idea of this study. This investigation aimed to shed light on how data journalism was applied while reporting on health in Bangladeshi media. The study was conducted following a mixed-method approach; quantitative data through content analysis and qualitative data through key informant interviews. The news published in August and September of 2022 in online editions of The Business Standard, the Prothom Alo, the Daily Star and the Ittefaq; was taken for content analysis. Additionally, four key informant interviews with academicians, journalism trainers and media development experts were conducted. The study concluded that data journalism practices in Bangladesh are not up to the standard. The scenario is also severely poor in terms of the number of published data stories; only 24 reports among 736 health-related news were data-driven stories. The Business Standard published 19 health-related data stories, which is the highest among the four news outlets. On the other hand, the Prothom Alo and the Ittefaq did not publish any health-related data story. Even the data-driven stories published in these four news outlets focused only on urban areas. Additionally, the data-driven stories were mainly reported based on government sources. Besides, among 25 data visuals, 84% were pictographs. However, the interviewees identified not having an Optical Character Recognition (OCR) tool for the Bengali language as a significant impediment to the flourishing of data journalism in Bangladesh. They also marked that, journalists in our newsrooms often do not possess the technical skills to carry out the data-driven story. Nevertheless, they proposed that, to improve the scenario of data journalism in Bangladesh, news industry and the universities should work together. Media development organizations should advocate the concept of data journalism in the newsrooms. Furthermore, they have to introduce workshops and training programs on data journalism.

**Keywords:** Data journalism, Online newspaper, Data visualization, Health news, Health journalism

### Introduction

The COVID-19 pandemic made everyone realize the importance of maintaining health and well-being. When there is a public health emergency, health journalists and the media can play a role in rapidly communicating vital information to the public (Mach et al., 2021). In a sense, they serve as a component of the community of health care providers. As citizens struggle to comprehend and navigate the health care system, journalists are responsible for researching and reporting on their needs (Schwitzer et al., 2005). Data journalism is extracting information with news value from data, writing news stories based on the extracted information, and visualizing the information (Veglis & Bratsas, 2017). As data journalism utilizes large amounts of data, it can give the audience more precise and interpretative information. Additionally, interpreting a large amount of data helps to assess risk situations better (Desai et al., 2021).

Bangladesh is a developing country with a large population facing significant health challenges such as malnutrition, infectious diseases, maternal and child health issues, and many more. In this context, health news coverage can yield fruitful outcomes regarding any health-related topic. Exposure to the media promotes healthier behaviors in the use of public spaces (Scopelliti et al., 2021). On the other hand, data-driven journalism has immense

\*Corresponding author: <anirudhabiswas.mcj@gmail.com>  
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potential to influence policymakers. Additionally, data can show many underlying characteristics that are not visible to the naked eye (Chai et al., 2021). Besides, from a socio-political perspective, the role of mass media as the fourth state of a nation is now under question. A load of press releases from these departments and sections is making the mass media a 'compromised fourth state' (Lewis et al., 2008). Living in the age of datafication (Arsenault, 2017; Lycett, 2013), data journalism can solve this as it enables the press to observe its watchdog role (Bril et al., 2012).

Concerning academic research, both health and data journalism are concepts that have yet to be investigated less in relation to Bangladesh. In this context, this study examined how data journalism is practiced in health reporting in Bangladesh. Additionally, it explored the barriers to the development of data journalism in health reporting in Bangladesh and how the situation could be improved.

### ***Data journalism is in the early stage in Bangladesh***

In 2018, Dataful, an open data-based information hub about Bangladesh, began operations. They prepare various Bangladesh-based open data with Accessible-Right-Now (ARN) engine and publish data-driven contents on their website. It derived the realization that the practice of data journalism has already been started in Bangladesh.

News outlets in Bangladesh had started to feature infographics in their story. But the practice of publishing news on the basis of data did not flourish (Datta, 2022). A study found that, in Bangladesh, data journalism is in its early stages. Only some investigative articles are based on extensive data analysis. The majority of data-driven stories focus on business and economic issues and sports. The Bangladesh Bank, the Bangladesh Bureau of Statistics, and a number of other government entities are the primary data sources for these articles (Islam, 2018). Another study examined the use of data journalism in Bangladesh's 2018 National Election in two prominent newspapers, the Prothom Alo and the Daily Star from December 15, 2018 to January 14, 2019. The results demonstrated that approximately 3% (29 out of 958) of election coverage in the Prothom Alo was data-driven, compared to 6% (19 out of 298) in the Daily Star (Quarmal & Islam, 2020).

### ***Poor state of health journalism in Bangladesh***

A study (Khasru et al., 2021) investigated health-related news published between March 1, 2017 and July 31, 2017, in several Bangladeshi newspapers and surveyed 23 health journalists. It was found that just under one-third (32.5%) of all health care providers mentioned in the news were registered physicians, while the remaining two-thirds (67.5%) involved unregistered clinicians or health care providers, such as physiotherapists, medical assistants, nurses, homeopaths, community health care providers (CHCP), kabiraj (Ayurvedic practitioners), fakirs (faith healers), religious leaders, health administrators, and pharmacists. Most health journalists (78.3%) had no previous training in health journalism, and only 26.1% of them were offered training by their media houses. A survey conducted on 100 journalists from eight administrative divisions showed that 48% of the survey respondents were unaware of the theoretical approaches used in health journalism. 88% had never attended a training or workshop on disaster or pandemic reporting and 10% found COVID-19 training to be beneficial (Chowdhury et al., 2022).

### ***Data journalism in health reporting***

A study was conducted on the visualization pattern of data-driven stories during the COVID-19 epidemic in China (Liu, 2021). The content analysis method was used to analyze the articles published between January 22 and October 26, 2020. Most of the data stories were identified to report with official government data. The data are credible, but the number of sources is marginally insufficient. Additionally, it was discovered that descriptive texts were less in the amount in these reports, which were primarily concerned with data analysis. Simple and easily understood illustrations were used for visual elements. Media outlets around the globe, such as the Financial Times, The Economist, The New York Times, and The Hindu, were engaged in systematically collecting, aggregating, and analyzing data. (Desai et al., 2021). The discussed literatures helped this study to know the patterns and practices of data journalism and health communication in Bangladesh and worldwide. Additionally, it helped to set a precise research method to undertake this study. The existing literature focused on how data journalism was practiced while reporting on covid-19. However, minimal focus was on how data-driven reporting was practiced for overall health beat. For this reason, this study was carried out to fulfill this gap.

The objectives of this study were i) to examine how data journalism is practiced in health reporting in Bangladesh, ii) to explore potential software, sources and iii) impediments toward the flourishing of data journalism in health reporting in Bangladesh.

### Materials and Method

This study followed a quantitative approach while examining how data journalism is practiced in health reporting in Bangladesh. Additionally, it followed a qualitative approach while exploring the potential software and tools for making health-related data stories, impediments toward the flourishing of data journalism in health reporting in Bangladesh. Thus, this study was carried out with a mixed-method approach.

Employing convenience sampling, this study looked into the online version of four newspapers' health-related news published from August 1 to September 30, 2022. The newspapers are (i) the Prothom Alo, (ii) the Daily Star, (iii) The Business Standard, and (iv) the Ittefaq. Elaborately, the health news archives of these four news outlets were integrated, well-organized, and well-navigated. Consequently, it was convenient to collect data from these four news outlets. The collected data were analyzed to examine how data journalism in health reporting is practiced in Bangladesh through content analysis. A coding sheet was developed where various factors, principles, and research techniques of journalism were followed. This study used Microsoft Excel to analyze these data. Likewise, to explore potential software and tools for making health-related data stories, and impediments toward the flourishing of data journalism in health reporting in Bangladesh, Key Informant Interviews (KIIs) were conducted through a semi-structured questionnaire. The interviews were analyzed thematically.

### Results

#### *Quantitative findings*

The researchers identified the total number of health-related data stories, data visualization patterns, sources and topics of data stories, and the number of data stories based on urban and rural areas through content analysis of news articles.

#### *Total number of health-related and data stories*

In August and September of 2022, The Business Standard Published 181 health-related news; 19 were data stories. Similarly, the Daily Star published 301 health stories; 5 were data-driven reports (**Figure 1**). In contrast, the Prothom Alo and the Ittefaq published 198 and 56 health news, respectively. However, no data stories were found in these two outlets. Therefore, the quantity of health-related data stories was found to be inadequate.

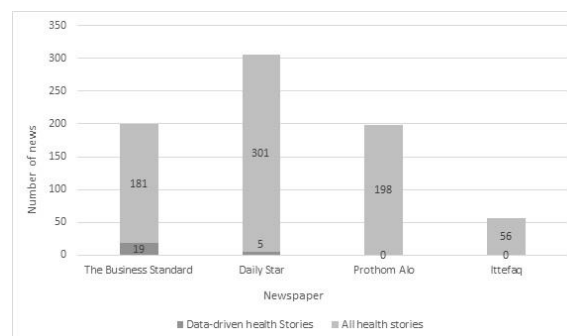


Figure 1. Total number of health-related stories and data-driven stories

#### *Text and number ratio in data visualization*

24 health-related data stories were found in The Business Standard and the Daily Star. The visuals of these data-driven reports carry 77% text (**Figure 2**). In contrast, the number used 23% to visualize those data. This indicates that news outlets put more focus on text than numbers in their data visuals.

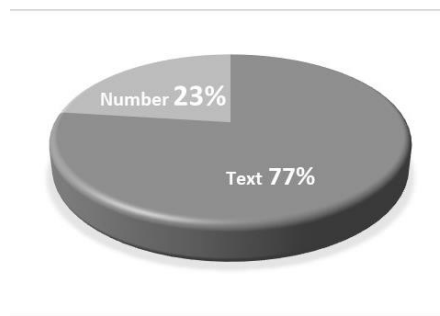


Figure 2. Ratio of text and number in data visuals

**Number of data stories by location**

The Business Standard published 19 health-related data stories; 13 covered the whole country, five were about Dhaka and one was about Chittagong (Figure 3). On the other hand, four data stories the Daily Star published were about the whole country and one data-driven report was about Dhaka. Number of data stories by location

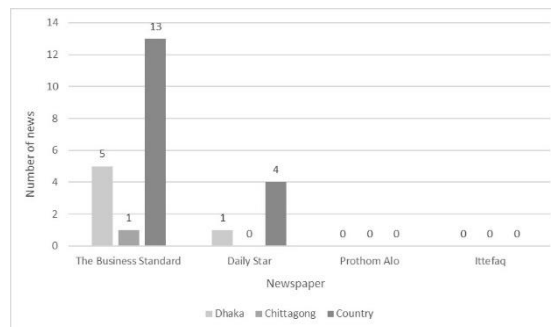


Figure 3. Number of data stories on the basis of location

**Number of data stories of urban and rural area**

The Business Standard published 19 health-related data stories, all of them were reported about the town side (Figure 4). On the other hand, the Daily Star published five data-driven reports. All of them were also reported on the town side. This demonstrates the media’s bias toward urban areas.

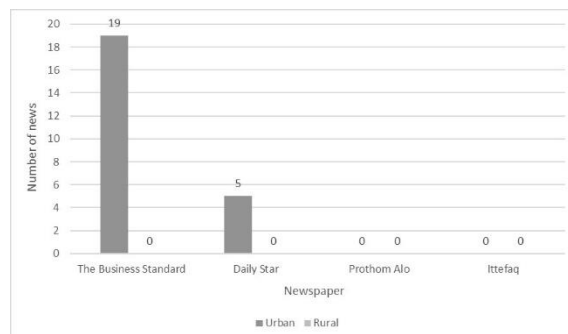


Figure 4. Number of data stories on the basis of urban and rural area

**Number of data stories of visualization type**

The Business Standard published 19 health-related data stories. They used 16 pictographs, one pie chart, one bar chart, one column graph, and one line chart to visualize data (Figure 5). In contrast, the Daily Star used five pictographs to visualize data. This indicates news outlets use pictographs more frequently than other types of visuals.

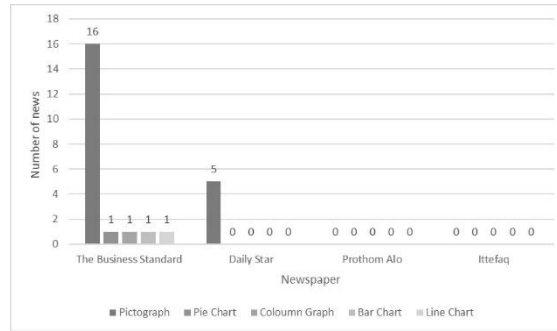


Figure 5. Number of data stories on the basis of visualization type

**Number of data stories of source**

The Business Standard published 19 health-related data stories, of which, six reports were made from primary sources, 11 were made from government sources, one was from World Health Organization’s website, and one was from research data (Figure 6). On the other hand, all five data stories of the Daily Star were made from government sources. This indicates that news outlets rely heavily on government sources for data-driven health stories.

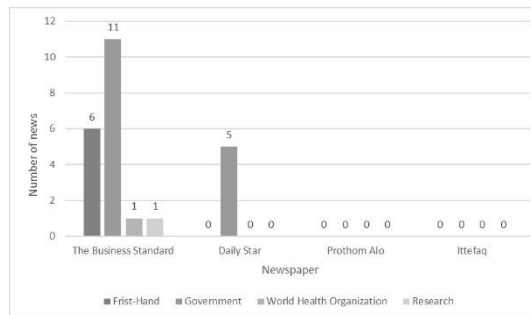


Figure 6. Number of data stories on the basis of source

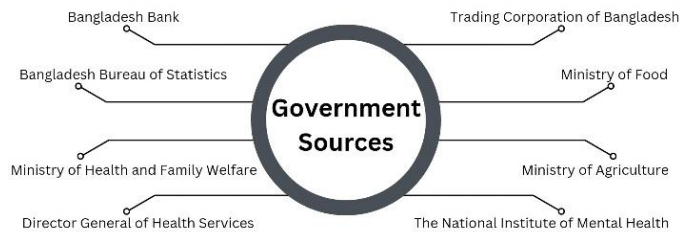


Figure 7. Details of government sources used to make data stories

**Number of data stories by topic**

The Business Standard published 19 health-related data stories; among them, 12 stories were on food, three stories were on disease, two stories were on health expenditure, one story was reported on health plan and one story was reported on hospital (Figure 8). In contrast, three data stories from the Daily Star were on disease, one was on food, and one data story was reported on health plan. This denotes news media have not explored significant topics like health-related corruption, budget provision, and insufficient health professionals while making data-driven reports.

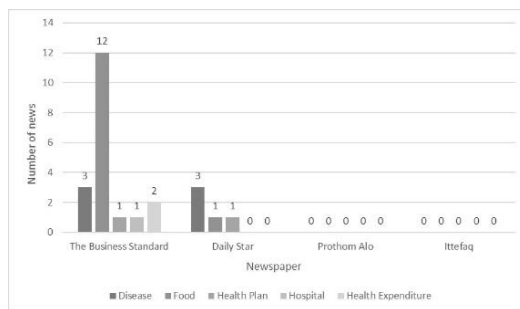


Figure 8. Number of data stories on the basis of topic

**Qualitative findings**

Through key informant interviews, this study identified some potential software and sources for making data driven-report and the impediments toward the flourishing of health-related data journalism in Bangladesh. Owing to the confidentiality issue, informants’ pseudo names were used.

Table 1. Details of interviewees of Key Informant Interview (pseudonyms were used)

Number	Name	Designation
1	Siraj Chowdhury	Bangladesh bureau editor of an international media development organization
2	Mominul Islam	Senior Lecturer of Journalism and Media Studies at a private university of Bangladesh
3	Shamim Ferdous	Project Manager of an international media development organization
4	Dr. Abdul Rahim	Associate Professor of Journalism, Media and Communication at a private university of Bangladesh

**Significance of data journalism in health reporting**

The interviewees discussed that human beings feel the most interest in knowing about their own life. For this reason, data journalism holds great significance in health beat. They also stated that what cannot be said openly can be shown through data visualizations and numerical analysis, even in a country like Bangladesh, where the press is under constant pressure. Shamim Ferdous stated,

“In a country like Bangladesh, where the press is under continuous pressure, issues that cannot directly shared, can be shared through numerical analysis and visualizations. Also, journalists can share composite stories through interacting infographics.”

It was found that data visualization saves time of the readers and easily evokes their interest. It also sometimes makes the report understandable regardless of literacy of the reader. The interviewees also pondered that data-driven reports may assist policymakers in making important decisions and necessary steps. Mominul Islam explained,

“Data reports help people in decision-making; for instance, if the COVID-19 infection rate increases in your locality, you must wear masks. Thus, people make a health safety-related decision after reading data stories.”

***Impediments to the flourishing of data journalism in health reporting***

How people think in the newsroom was a matter of major obstacle to the development of data journalism. Elaborately, senior journalists in newsrooms tended to refrain from learning new technological skills. They were not familiar with mathematics and statistics. As a result, there was negligence in the newsroom toward data journalism. Shamim Ferdous opined,

“One of the challenges to the growth of data journalism is the mindset of journalists. Senior reporters and editors often resist picking up modern software and hardware. Mathematics and statistics strike fear into their hearts. This has led to a lack of emphasis on data journalism within the newsroom.”

Data journalism was not prioritized in the academic programs offered at universities in Bangladesh. As Dr. Abdul Rahim said,

“The curriculums of the universities of Bangladesh do not prioritize data journalism. Even they do not signify skills like data analysis and visualization. Therefore, students do not learn much about data journalism’s theoretical and practical aspects.”

No Optical Character Recognition (OCR) tool was created for the Bangla language. Consequently, no Bangla-written numerical data set could be utilized directly. The reporter had to manually enter the information. Consequently, data journalism in Bangladesh became time-consuming. Additionally, organized digital data sets were uncommon here. Siraj Chowdhury said,

“There is no OCR tool developed for Bangla Language. Consequently, no numeric data set written in Bangla can be used directly. The reporter has to input data manually.”

***Potential tools and software for making health-related data stories***

The interviewees identified some software and tools for data-driven journalism (Figure 9). They suggested Google Sheets and Excel for conducting data analysis, Open Refine and Trifacta for data cleaning and Canva, Flourish, Infogram, Datawrapper, and Tableau for data visualization.

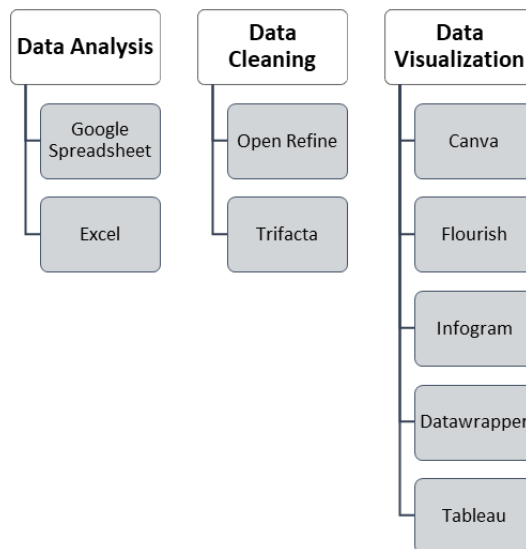


Figure 9. Details of suggested tools and software

### ***Sources for data-driven reports in health beat***

The interviewees discussed that data reports require numeric data sets. Registry books of hospitals and clinics could be used as vital sources for data-driven reports in Bangladesh. Besides, Government organizations, such as the Ministry of Health and Family Welfare and Bangladesh Bureau of Statistics could provide data sets related to health. Siraj Chowdhury stated,

“Registry books of hospitals can be a potential source for data journalism. Databases can provide insightful information about patients, health expenditures, diseases, and many more. However, the problem is that these data are often not preserved digitally.”

Additionally, the reporters could use World Health Organization and non-governmental organizations such as the Red Crescent Society Bangladesh and Mamata Bangladesh as sources for making data-driven reports.

### ***Measures that should be adopted***

The interviewees addressed that the media industry and universities should work closely to improve the practice of data journalism in health reporting in Bangladesh. Additionally, universities should have arranged seminars and panel discussions engaging media practitioners and researchers. It would have enabled the media executives to understand the importance of data journalists in the newsroom. Likewise, media educators could have assessed the current needs and loopholes of the media industry through these programs. Shamim Ferdous stated,

“Media development organizations should also advocate data journalism through meetings and conferences with media executives. At the end of the day, a data journalist will be appointed; a data-driven report will be assigned or not; it is their call. Every other program will go in vain if we fail to convince the media executives.”

The interviewees conversed that media development organizations should launch dedicated data journalism fellowship programs with small groups of young journalists interested in data journalism. These fellowship programs should provide hand-holding mentorship to be impactful.

## **Discussion**

The number of health-related data reports were found to be insufficient. Moreover, the data-driven reports exclusively focused on urban areas, which portrayed biases in media coverage towards urban regions. The interviewees reflected upon the problematic aspects of practicing data journalism due to the absence of an Optical Character Recognition (OCR) tool for the Bengali language. However, they proposed several software and tools, such as Excel, Trifacta, and Canva, that can be utilized to create data-driven stories.

The researchers found 24 health-related data-driven reports in four news outlets' online version. Among them, the Prothom Alo and the Ittefaq did not publish any health-related data story. So, the number of data story is not sufficient. A similar study (Quarmal et al., 2020) also found that the use of data was not that significant in terms of the number of data-driven stories.

Among 24 health-related data stories, 16 were reported from government sources. Only 6 reports were made based on primary data. In contrast, 1 report was made on research data and 1 on World Health Organization's data. A study (Islam, 2018) also found that data-driven reports are mostly made with government sources in Bangladesh.

News outlets focus most on Food and then Disease while practicing data journalism in health reporting. 55% of stories were reported about Food, and 25% of stories were reported about Disease. Besides, 8% of stories about health expenditure, 8% about health plans, and 4% about hospitals were reported. In contrast, News outlets did not explore necessary topics like health-related corruption, budget provision and the inadequate number of health professionals.

While practicing health-related data journalism in health reporting, news outlets mostly make stories on Dhaka. They put less focus on other divisions. Among 25 data stories, 71% were about the whole country, 25% were about only Dhaka, and only 4% were reported about the Chittagong division. There was no story reported about other divisions in the country. Similarly, news outlets paid zero attention to rural areas. All the stories reported were about urban areas. These findings also match the study (Trisha et al., 2018), where they found that media focuses more on urban areas due to their commercial zeal.

Health-related Data-driven stories mostly used pictograph for data visualization. For 24 stories, 25 data-visuals were used. Among them, 84% were pictograph; pie chart, column chart, bar chart and line chart were used

4% each. Additionally, in visualization, the number and text ratio were 23:77; this depicts that news outlets used more text in the data visualization than numbers.

The interviewees identified that data journalism is very necessary, especially for health reporting. Data-driven reports help people and policymaker to take major decisions. Additionally, the data visualization also makes the report understandable to people who are illiterate. Besides, it helps the journalist to tell compound story which matches with a statement (Bradshaw, 2012) that data journalism can help a journalist tell complex story through engaging infographics.

Interviewees discussed there is no OCR tool for the Bangla language. As a result, making a data story becomes very time-consuming. A study (Islam, 2018) also found that the newsroom's main challenges are a shortage of time and the need for data journalism skills. Additionally, digital data availability is a significant concern for practicing data journalism in health reporting in Bangladesh.

Interviewees pointed out that the journalists in our newsroom do not have the necessary technological skills to carry out data-driven reports. A study conducted 24 semi-structured interviews with professionals in British newsrooms. Despite claims of journalistic authority over computational proficiency, at least half of regional data journalists reported feeling constrained by their inability to write software code regarding this skill as a robust enabling agent in data journalism (Borges-Rey, 2016).

Data-driven reports are mostly made with government sources, focusing mostly on food and disease, and not exploring necessary topics like health-related corruption. Data journalism is necessary for health reporting, but it is time-consuming due to the lack of OCR tool and technological skills needed to carry out data-driven reports are absent in the newsrooms of Bangladesh.

The media development organizations such as the DW Akademie, Internews, and Global Investigative Journalism Network may discover the findings of this study to be helpful. Additionally, this research may stimulate the interest of future researchers in studying the application of journalism in other news beats. Furthermore, researchers worldwide may find it interesting to examine the application of data journalism in health beat in other countries.

The strength of this study is that it did not confine itself to just examining the practice of data journalism in the health news coverage of Bangladesh. Instead, it also explored the impediments to the flourishing of data journalism and extracted some potential software and tools through key informant interviews. Thus, it captured almost the whole situation incorporating the problems and prospects of data journalism in health reporting in Bangladesh. In contrast, the limitation of this study is that it only examined news in a timeframe of two months. A more extended timeframe should have been used.

### **Recommendations and Conclusion**

This study recommends the news outlets to revamp health-related data journalism. Elaborately, the media outlets of Bangladesh should train their reporters in technologies related to data journalism. They should also equally emphasize urban and rural areas. Besides, this study suggests that the media development organizations organize long-term data journalism workshops. These organizations should also educate media executives about the significance of data journalism in health reporting to increase the number of data-driven reports in this field. The media development organizations can consider creating a Bangla OCR tool in order to assist the news outlets. Additionally, the study recommends future research initiatives to consider larger sample sizes and more extended timeframes. At the global level, journalism embarked on using artificial intelligence (AI). So, researchers may consider exploring the feasibility of integrating AI and data journalism.

During the COVID-19 pandemic, journalism was redefined by data-driven reportage worldwide. It can provide both macro and micro-scale views of health care aspects. By analyzing and visualizing health data, data journalism helps to identify patterns, trends, and correlations in the domain of public health. These analyses can be used to monitor disease outbreaks, track the effectiveness of interventions, and identify emerging health issues in Bangladesh. For these reasons, data journalism should be promoted and practiced more and more in health beat.

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### Conflicts of interest

There is no conflict of interest in publishing this work.

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