

# Dengue Mortality Rate challenges the Public Health System in Kolkata: A Sociological Investigation

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**ABSTRACT:** The study intends to demonstrate the potential of the newspaper articles to portray the Dengue Fever outbreak and the potential harm it causes to the Public Health in West Bengal with special reference to Kolkata. The newspapers serve as the source of valuable information on the early Dengue fever outbreak detection, surveillance and epidemiological research. The objective of the study was 1) To find out how the fluctuation of Dengue Fever reported articles in one 'Local' and one 'National' newspaper circulated in Kolkata, can be used to monitor the temporal trends of Dengue outbreak in Kolkata. 2) To uncover and highlight the underlying fact from the news articles which discussed the Dengue Death in Kolkata in the year 2018. 3) To find out how were the public health facts used in the news articles to spread awareness, control and prevention of the spread of Dengue Virus in Kolkata. The method used was the 'Media Content Analysis', here the two leading newspaper 'Anandabazar Patrika' and 'The Telegraph Calcutta', was used to analyse the Dengue Fever news articles and how they cluster together to communicate the Public Health messages to their audience through the press. A total of 1900 articles were analysed over a period of one year (January 2018 to December 2018), and they were searched according to the selected keywords. The articles were coded and framed according to their type. The data were then entered in 'Microsoft Excel 2007' and analysed. The results showed that a strong positive correlation was seen between the reported number of Dengue Death cases and the number of news articles published in the year 2018. And also a strong positive correlation was seen between the Dengue Death case and the related Environmental Pollution (water logging in garbage, tyre, tank, drain, ponds, vegetation, canal) as portrayed and published in 'picture article' by the news papers. This study showed the advance approach in analysing the news paper articles and produce valuable information to detect the early occurrences of Dengue Fever and to take necessary action and surveillance by the Public Health professionals specially in India with due importance to Kolkata, where the dengue case gets under reported or not reported at all due to poor infrastructure.

**Keywords** – Public Health Model of Reporting, Dengue Fever, Dengue Death, Environmental Pollution, India.

## INTRODUCTION

Public health surveillance is that the process of monitoring trends through data collection, collation, analysis, and dissemination of public health information for evaluation and public health response, to scale morbidity and mortality (Langmuir AD 1963, Baker MG, Fidler DP 2006, Calain P 2007). And the major public health threat is the Dengue, which are a global concern and also the major public health threat in Kolkata (Halstead SB 2007, Mustafa MS, Rasotgi V, Jain S et al). Dengue as a communicable disease needs outbreak investigation, surveillance and preventive measures and for all of them we need constant control mechanism (WHO 2006). The epidemiology of dengue first outbreak occurred in Calcutta (now Kolkata) in 1963 (Ramakrishnan SP, Geljand HM, Bose PN et al, Chaturvedi UC, Nagar R). Dengue had been restricted to urban areas, but now it is prevalent in rural regions too (Arunachalam N, Murty US, Kabilan L et al). The expansion of dengue in India has been related to unplanned urbanization, changes in environmental factors, host-pathogen interactions and population immunological factors. Inadequate vector control measures have also created favorable conditions for dengue virus transmission and its mosquito vectors. *Aedes aegypti* is the main competent vector for dengue virus in India and in Kolkata (Gubler DJ). So prevention is the main long-term approach to reduce risk factors of Dengue disease burden (Beaglehole R, Bonita R 2001). So, this study of outbreak investigation establishes the existence of an outbreak and identifies the source (WHO 2004). Unfortunately, data from surveillance systems are often delayed and reporting is inaccurate, making it difficult to use such data for the detection of outbreaks (Farrington CP, Andrews NJ, Beale AD, Catchpole MA 1996, Liu Y 2004, Brownstein JS, Freifeld CC, Reis BY, Mandl KD 2008, Thacker SB, Quarters JR, Lee LM, Davies SE 2012). So here in India, especially in Kolkata the under reporting of the disease Dengue happens quite often, so the researcher in this study took his own initiative to investigate and reveal the original fact which was reported daily in local and national newspaper and tried to portray the public health conditions about the Dengue epidemic during

the year 2018, similar to the study by (Shepard et al 2014) where the study reported an underestimate of 282 times the number of official reported dengue cases in India for one district under study. Underreporting of these diseases negatively impacts the public health policy makers' abilities to decrease morbidity and mortality (Konowitz PM, Petrossian GA, Rose DN 1984, Suaya JA, Shepard DS, Beatty ME 2007, Beatty ME, Stone A, Fitzsimons DW, Hanna JN, Lam SK, Vong S, Guzman MG, Mendez-Galvan JF, Halstead SB, Letson GW 2010) and same happened in Kolkata as the Dengue Death goes under reported every year and so there is no record found in the official website for the following two year 2018 and 2019, where as the local newspaper portrayed a different story where the Dengue Fever spreads like epidemic and followed by Dengue death in many areas of Kolkata in West Bengal. As there are no record of Dengue death so neither the state government ask for 'oil to kill mosquito' from the central government nor the central government have any data of Dengue death in Kolkata to make further preventive policy or measure to help the state government to combat the situation over all it shows a total negligence to stop the spread of dengue in Kolkata (published in Anando Bazar Patrika on 9<sup>th</sup> October 2018). Furthermore, national health agencies across the globe publish reports that vary in their timeliness, some agencies report data from the previous week, and some delayed, that can range as long as multiple years (Woodall J 1997) and same happened in Kolkata during 2018 and 2019 with no official report on Dengue Fever outbreak published in the government official website nor actual number of Dengue death in Kolkata. That's why the researcher chooses this topic to study as no other researcher worked on this.

## OBJECTIVE

- 1) To find out how the fluctuation of Dengue Fever reported articles in one 'Local' and one 'National' newspaper circulated in Kolkata can be used to monitor the temporal trends of Dengue outbreak in Kolkata.
- 2) To uncover and highlight the underlying fact from the news articles which discussed the Dengue Death in Kolkata in the year 2018.
- 3) To find out how the public health issues portrayed in the news articles to spread awareness, control and prevention of the spread of Dengue Virus in Kolkata.

## MATERIALS AND METHOD

The Public Health Model of Reporting (PHMR)

The Public Health Model of Reporting (PHMR), which promotes a public health perspective on reporting health issues, is a useful guide. Our goal is to descriptively assess sorts of public health information and story characteristics of Dengue news coverage under this model. PHMR was originally created as how to spur change in reporting associated with crime and violence (Rodgers S & Thorson E 2001). The goal of PHMR is to explain the kinds of public health facts that might enable readers to realize a broader perspective on issues which will threaten public health (Stevens J.E 1998). PHMR advocates that a part of the answer to public health problems is that the provision of critically important information about the causes, costs and consequences of health issues which will prompt individuals to form proactive health choices and, thus, prevent many health problems (Coleman R & Thorson E 2002).

The journalism can highlight and frame certain aspects and play a task in steering policymakers for decision-making. On these grounds, this study employed conceptual content analysis for two leading newspapers, Anando Bazar Patrika (Bengali version local newspaper) (newspaper 1) and The Telegraph Calcutta (English version national newspaper) (newspaper 2), with top circulation in Kolkata. Kolkata is that the capital of West Bengal and therefore the most populous urban agglomeration in India.

## STRATEGY TO EXTRACT DATA

A total of 1900 news articles of both the newspaper 1 and newspaper 2 were collected, which represented the whole universe (news stories/editorials) for the specified period of 1 year (January 2018 to December 2018). Articles were excluded if they were duplicating (articles found around the same time, with same number of words in the same publication and the duplicating text).

Only the articles which include exact keywords words like Dengue, Dengue Fever, Fever, Dengue death, Mosquito Bite, Canal, water logging, Dengue 2, mosquito were included in the analysis [Figure 1]. A codebook was developed as an adaptation of (Eckler P, Rodgers S, and Everett K).

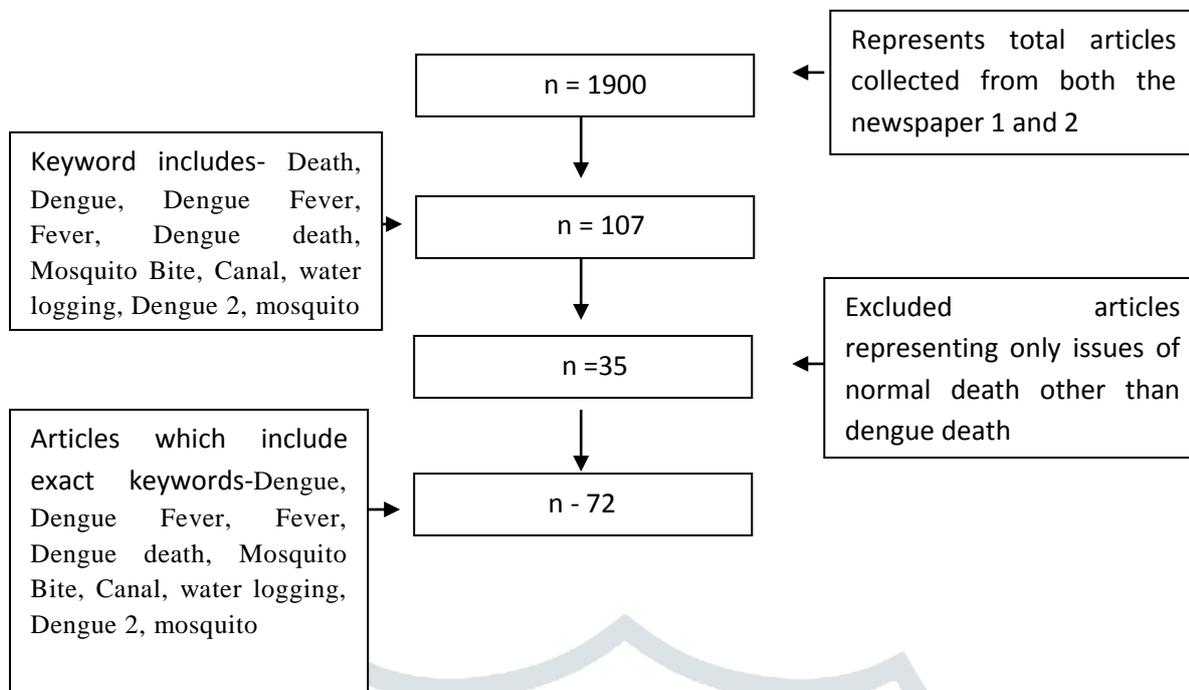


Figure 1: Flow chart showing sample selection process

**QUANTITATIVE ANALYSIS**

The various variables were categorized and coded by the author. The frequency of appearance of every coding was analyzed employing a frequency count. The unit of study was the news article.

**QUALITATIVE ANALYSIS**

The headlines, subhead, and text of all articles were analyzed descriptively; the full text of each article was reviewed by the author again and again for the emerged study variables.

Figure 2: Step wise data extraction and content analysis schema

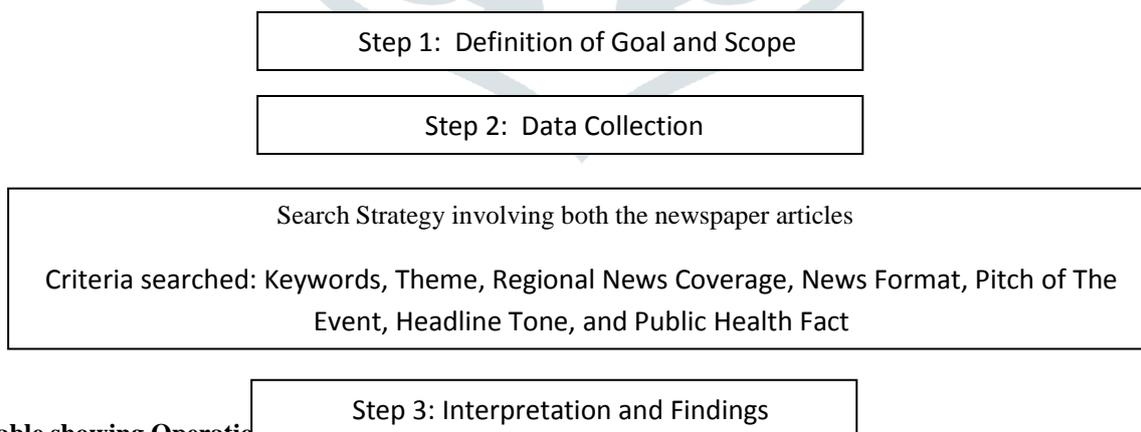


Table 1: Table showing Operational theme summary

Theme	Description
Prevention of Dengue	Steps taken by the KMC(Kolkata Municipal Corporation) to stop the spread of Dengue,
Reported case of Dengue	Persistence of Dengue fever
Politics with reported dengue death	KMC (Kolkata Municipal Corporation) disagreed the report on Dengue death prescribed by the Private Hospitals.
Emergency plan opted to stop Dengue spread	Procedure and necessary action taken by KMC(Kolkata Municipal Corporation) for the immediate betterment of the Public Health

Environmental Pollution leads to the spread and germination of dengue virus	Degradable and pollutant such as domestic garbage, vehicle tyres, ponds and vegetation, drains, canal, plastic and cans.
Public Health awareness	Awareness Campaign, propaganda, banner, leaf lets, poster, awarded contest in case of Dengue awareness, public health awareness at larger community.

## CODING CATEGORIES

A total of 7 main coding categories were found and analysed: 1) Appearance of keywords, 2) Theme, 3) Regional News Coverage, 4) News Format, 5) Pitch of the Event, 6) Headline Tone, 7) Public Health Fact

## APPEARANCE OF KEYWORDS

It includes appearance of keyword in: 1) Headline, 2) Sub head, 3) Text, 4) Combination.

## REGIONAL NEWS COVERAGE

The place or in more specific term geographical place in which the story's event, issue, feature, or editorial took place was categorized as follows: (1) local (the news story occurred in the local town in which the newspaper is located), (2) state (occurred in the state, i.e., Kolkata in which the newspaper resides), (3) national (occurred anywhere else in India except for Kolkata).

## THEME

The principal subject that centered the news story was subcategorized into six heads: (1) Prevention of Dengue; (2) Reported case of Dengue; (3) Politics with reported dengue death; (4) Emergency plan opted to stop Dengue spread; (5) Environmental Pollution leads to the spread and germination of dengue virus; and (6) Public Health awareness.

Coding preferred a hierarchical order by examining the headline first, subhead, and text afterward. For instance, if the headline was about "Dengue Death" (Ananda Bazar Patrika, October 22, 2018), the "Politics with reported dengue death" topic was selected. In cases where the headline was ambiguous and the examiner was unsure which topic to code, henceforth, the first sentence (and no more than the first paragraph) of the story was taken into consideration.

## NEWS FORMAT

The news format coverage was primarily classified as: (1) event/issue, i.e., a story that is happening currently or recently happened; (2) feature was defined as a special story or article that is not "the current talk of the town," but was distinguished by writing style; and (3) editorial included opinions/letter to the editor/briefings/commentaries

## PITCH OF EVENT

The fundamental and philosophical amalgamated tone of the news which is presented to the readers was referred to as "Pitch of event." The focus was on how the news story presented information for and against Dengue. There were 4 options: 1) Political concealment of the actual fact, 2) water logging problem, 3) Government negligence, 4) Community Public Health awareness.

## PUBLIC HEALTH FACT

There were 3 options: 1) Health Effect – defined harmful consequences related to Dengue Fever. 2) Financial Aspect – covered expenses/burden due to Public Health problem at familial, community, city, state or national level. 3) Others – category comprised of Public Health comparing and contrasting dengue fever outbreak within different places of West Bengal.

## HEADLINE TONE

Defined as the primary attitude or valence. There were 3 options: 1) Positive, 2) Negative, 3) Neutral

## STATISTICAL ANALYSIS

Correlation and Regression test was conducted to draw comparisons between the two newspapers ( $P < 0.05$ ). Statistical analyses were performed using Microsoft Excel version 2007.

## RESULTS

A total of 72 articles from newspaper 1 and from newspaper 2 published during 1-year period were retrieved for content analysis. The analysis showed that keywords searched appeared in the headline for most of the articles (71.64%) followed by the

combination (17.91%) for newspaper 1(ABP); however, in newspaper 2(The Telegraph Calcutta), keywords were mostly observed in the headline (100%).

Regarding the regional coverage of the articles, mostly, the news published was from the local state in both the newspapers 65.67% (newspaper 1) and 40% (newspaper 2) respectively.

**Table 2: Thematic representation of Dengue in the newspapers**

Theme	Newspaper 1, n (%)	Newspaper 2, n (%)	P
Prevention of Dengue	3(4.48)	0(0)	P < 0.05*
Reported case of Dengue	19(28.36)	1(20)	
Politics with reported dengue death	6(8.96)	0(0)	
Emergency plan opted to stop Dengue spread	1(1.48)	0(0)	
Environmental Pollution leads to the spread and germination of dengue virus	15(22.39)	1(20)	
Public Health awareness	23(34.33)	3(60)	
TOTAL	67(100)	5(100)	

Regression test in Microsoft Excel version 2007, \* statistically significant.

On assessing the theme of the news articles published concerning “Dengue” it was interesting to note that, in both the newspapers, majority of the articles discussed about Public health awareness that was 34% in newspaper 1 and 60% in newspaper 2. [P < 0.05; Table 2].

Mostly, the articles in newspaper 1 were of editorial format (55.22%) in comparison to feature format and in newspaper 2 (60%) was of editorial format.[P < 0.05].

Regarding the pitch of the articles, it was observed that only 38.8% of newspaper 1 and 40% of newspaper 2 stories had a negative slant towards negligence of Dengue.

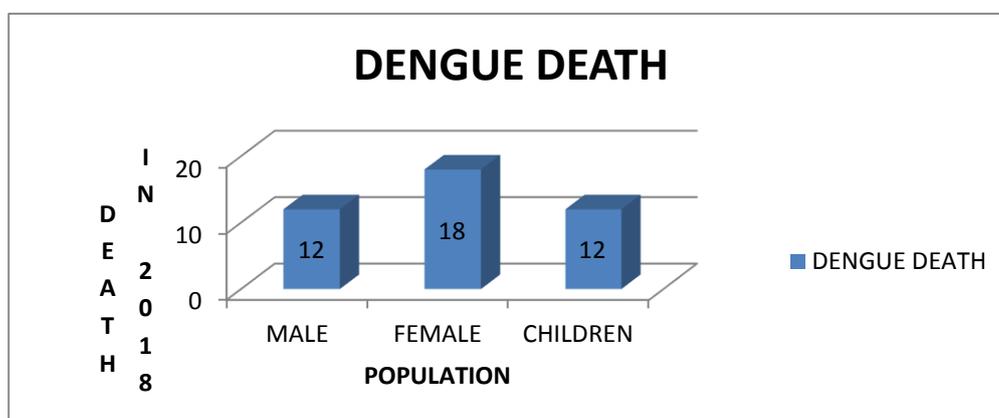
During that period, most of the stories conveyed Public Health impact. 80.6% and 80% of the articles published in newspapers 1 and 2, respectively, highlighted the health effects/consequences of Dengue, the difference being statistically significant [P < 0.05]. See Table 3. In addition, front page stories varied from 4.48% in newspaper 1 to no front page news in newspaper 2.

**Table 3: Public health Fact regarding portrayal of Dengue in newspapers**

Public Health Fact	Newspaper 1, n (%)	Newspaper 2, n (%)	P
Consequence	54(80.6)	4(80)	P < 0.05*
Cost	13(19.4)	1(20)	
Context	0	0	

Regression test in Microsoft Excel version 2007, \* statistically significant.

Headline tone had a more negative slant in both the newspapers, in newspaper 1 (51%) and newspaper 2 (40%).



**Figure 3: Demographic presentation of Dengue Death in Kolkata in the year 2018**

The study found the females were maximum (18) who suffered from Dengue and died during the year 2018 than the male only (12) died of Dengue, whereas the children accounted (12) in that year who also suffered from Dengue death as had been published in both the newspapers during the year 2018.

## CONCLUSION

Answering the research question 1, the results stated that there was a correlation between the number of Dengue case and the number of reported articles. Pearson  $r = 0.99$ , showed a strong, positive correlation between the number Dengue case and the number of news articles published for those place.  $R^2 = .98$  [ $F(1, 4) = 233.091$ ,  $P = 0.00010$ ], ANOVA result showed statistically significant. Well the work of (Yiding Zhang<sup>1</sup>, Motomu Ibaraki<sup>2</sup> and Franklin W. Schwartz) stated the same thing as found in this study, while doing their research.

Answering the research question 2, the results found the under lying fact which revealed that there was a correlation between the Dengue death and the surrounding environmental pollution as portrayed by both the newspaper while reporting the Dengue death by putting the 'person died' with their 'picture' and as well as side by side putting the picture of the 'environmental pollution(which include pictures of vehicle tyre with water logging, dirty ponds and vegetation, drains with clogged water, house hold waste, pits dug and covering picture, canal, mosquito nets, ) all these pictures of Dengue affected death person validates death and environmental pollution picture signified and highlighted the Dengue incidence of that place. Pearson  $r = 0.94$ , showed a strong, positive correlation between the number Dengue death reported and the environmental pollution portrayed in the 'pictured article' for that place.  $R^2 = .88$  [ $F=1, 4 (31.72, P = 0.004)$ ], ANOVA result showed statistically significant. Here again the work of (P. Datta, S.A Khan, A.M Khan, C.K Sharma, P.K Doloi, J. Mahanta) showed the same outcome as shown in this study.

Answering the research question 3, the results showed that in newspaper 1 only (4.48%) reported news showed about prevention and control of Dengue and in comparison no such was found in newspaper 2.  $R^2 = 0.78$  [ $F=1, 4 (14.92, P = 0.018)$ ], ANOVA result showed statistically significant.

So we can see that more prevention and control mechanism should be undertaken by the government to stop the spread of Dengue in Kolkata.

## ACKNOWLEDGEMENT

This paper is the part of my thesis. I show my gratitude to my guide and supervisor Dr.Saheli Guha Neogi Ghatak, Department of Sociology, Adamas University for her guidance.

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RESEARCH INTEREST – DATA MINING AND MEDIA CONTENT ANALYSIS