

**THE ROLE OF SOCIAL MEDIA IN FRAMING ZIKA LITERACY: A
TEXTUAL STUDY OF *THE NEW YORK TIMES*' HEALTH AND
WELLNESS BLOG**

by

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My Father is my hero, he is the torchbearer of my education, I dedicate this
paper to him.

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ABSTRACT

Social media have been a key player in our day-to-day life. From new disease to latest technology, it has been predominant in our life. Blogs as part of new media have also been contributing our lifestyle. This research has been conducted on *New York Times' Health and Wellness* blog, and the relevant comments from bloggers, and reader to examine how Zika has been depicted in this health blog and contributed to existing knowledge. In the findings, it has been salient that Zika was framed as global threat, global health emergency, national crisis, minimal health risk, preventable disease and WHO is responsible for it. Such framings of the infectious disease in the social media obviously create an attributed picture of Zika as both educative and dangerous.

The contradictory aspects of framing the disease in such a way definitely offer of an issue that is still in early stages and being formulated, encouraging blog interests and opinions. Despite all the misrepresentation of Zika, there is a wide range of possibilities that both bloggers and readers have an extensive platform to learn, discuss, and share their knowledge of the epidemic and thus, they become literate on the topic.

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CHAPTER ONE: INTRODUCTION

In the 20th century, people fought many infectious diseases including smallpox, malaria, yellow fever, dengue, cholera, tuberculosis, and plague, and reduced their impact. But our existence is always being threatened by such diseases, and they often use media – including social media – as part of the effort to curtail disease. This research involves study of a health blog in its role in framing literacy about Zika. As the fight over Ebola recedes, the world has experienced another growing pandemic: Zika. Zika has recently been a matter of great concern in the United States, Latin America, and around the world as thousands of men, women and children succumb to this rapidly growing disease. Although in November 18, 2016, the World Health Organization declared Zika was no longer a global emergency, but it is still found in affected regions. On March 6, 2017, a study published in the Canadian Medical Association that examined 1,118 Canadians returning from trips to Zika-infected areas found Zika was “more severe than expected. They found 10% of patients diagnosed with Zika had syndromes like Guillain-Barré, GBS, and/or Zika viral meningitis, which were unexpected. Doctors emphasized prevention as they found more complicated illnesses than anticipated. According to the Center for Disease and Control (CDC, 2016), Zika virus is spread to people primarily through the bite of an infected mosquito (*Aedes aegypti* and *Aedes albopictus*). In United States, 24,963 travel-associated cases and 224 locally associated cases were reported. One-hundred and forty-three travel-associated cases and 36,432 locally associated cases were reported in US territories including American Samoa, Puerto Rico, and the US Virgin Islands (CDC, 2016).

Zika virus was first discovered in 1947 and is named after the Zika Forest in Uganda (CDC, 2016). The first human cases of Zika were detected in 1952 and since then, outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands (CDC, 2016). Before 2007, at least 14 cases of Zika had been documented, although other cases were likely to have occurred and were not reported (CDC, 2016). The epidemic has also reached US territories. According to the CDC (2016), as of September 7, 2016, laboratory-confirmed US Zika cases were reported to ArboNET. The CDC (2016) says, because the symptoms of Zika are similar to those of many other diseases, many cases may not have been recognized. The CDC (2016) also confirms the disease normally induces mild symptoms lasting for a week or sometimes no symptoms at all, but during infections, the virus can cause serious birth defects (e.g., microcephaly), and there appear to be sequelae. According to the CDC website (2016), the most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). The organization also says, other symptoms include muscle pain and headache and symptoms can last for several days to a week. The CDC (2016) refers people usually are not sick enough to go to the hospital, and they very rarely die of Zika and once a person has been infected with Zika, they are likely to be protected from future infections. The CDC (2016) warns that a pregnant woman can pass the virus to her fetus and infect the baby during pregnancy. The CDC (2016) further indicates, a person with Zika can pass the disease to his or her sex partner. The CDC (2016) mentions diagnosis of Zika is based on a person's recent travel history, symptoms, and test results. It says a blood or urine test can confirm a Zika infection and symptoms of Zika are similar to other illnesses spread

through mosquito bites, like dengue and chikungunya. Family physicians or other healthcare provider may order tests to look for several types of infections (CDC, 2016).

Blogs and Social Media

Since the primary objective of the research is also to find out the framing Zika literacy based on blog sharing among writers and readers, it is important to have a precise understanding about social media and blogs. Along with the efforts of medical scientists to control these outbreaks, media professionals have also played a role by educating, communicating, and persuading people. As new media have become an essential aspect of our media environment, it is important to see how social media follow the footprint of mainstream media to play their role by sharing and spreading information to combat these diseases. In the era of modern communication and technology, social media have contributed to our society in many ways. People not only consume what news media bring to them but also share feedback on particular newsfeeds. They share their ideas, knowledge, and experiences on many socio-economic issues through social media. Facebook and Twitter are two platforms for sharing and disseminating health knowledge. Because of the exponential adaptation of social media, the number of users has grown dramatically since the first social networking site SixDegree.com was founded in 1997 (Elison 2007). The adaption of social media spread very swiftly into different sites such as Myspace, LinkedIn, Hi5, and later, Facebook. Mark Zuckerberg started Facebook in February 2004. Though the initial purpose of Facebook was to connect the students in Harvard dormitories, soon it had 1.55 billion users as interest grew it (Statista, 2015). These new media contribute to our society in many ways. But before the social media

there were blogs, enabling users to freely share content online. A detail of blogs' definitions, history, and functions is given below.

Jan Schmidt (2007) in his article "Blogging Practices: An Analytical Framework," wrote that blogs are frequently updated websites where content such as text, pictures, sound files, etc. are "posted on a regular basis and displayed in reverse chronological order." Readers often have access to comments or posts, identified by a unique URL. Postings are linked in the sidebar, and this is a clustered network of interconnected texts: the "blogosphere." Referring to blogpulse.com, Schmidt (2007) noted there are 50 to 85 million blogs traced as of June 2007. Thus, "communities of blogging practices emerge as groups of people who share certain routines and expectations about the use of blogs as a tool for information, identity, and relationship management." According to research done by Jan Schmidt (2007), this analytical framework can be the basis for systematic, comparative, and longitudinal studies that will further understanding of similarities and differences in blogging practices.

Weblogs (or blogs in short) represent retrospective thoughts, accounts of daily events, journalistic practices, political mobilizations, platforms of open-ended literacy engagement, combination of constant exhibition of images, and videos (Herring et al., 2005; Lenhart and Fox, 2006; Siles, 2011). Siles (p. 738) states that researchers call it a Web 'format' because of its fluidity, and this format permits different kinds of contents or posts and hyperlinks both reverse chronologically and discretely. Blogs are usually programmed in automated software and also include features such as archives of previous posts, search functions within the website, content syndication, and a sidebar where links to other blogs are listed (Herring et al., 2005; Papacharissi, 2007). An early blogger,

Rebecca Blood (2002b), argues that originally blogs served as ‘filters,’ since websites involved “classifying and annotating” online information (p. 738). Later this web format merged with sites such as diaries and journals because of the emergence of software after 1999. Then, blogs moved to free interface from the “filter-style weblog to journal-style blog” (Blood, 2002b). By the end of the 1990’s blogs started emerging in different genres such as history, health, education, etc. (Rosenberg, 2009).

People learn about many health matters in blogs, and there are many health blogs where doctors, patients, and others share their experiences. Some social blogs conduct constructive discussions on Healthcare. This research will focus on one of the most popular health blogs entitled *Health and Wellness* of *The New York Times*. In terms of the participatory culture of the internet, this study will explore how these blogs contribute to health knowledge in Zika disease prevention.

CHAPTER TWO: LITERATURE REVIEW

Health literacy is a “discrete form” (Kickbusch, 2001) of literacy, which is becoming increasingly significant for socio-economic and health development around the world. There has been a great deal of research on education and general literacy as tools to improve the overall development of society. The research on general literacy can be argued to contribute to the development of our society, yet they are not sufficient to identify the major outcomes and new challenges that the healthcare sector is encountering. Though the primary purpose of the research is to find out the framing of Zika, yet, the research also wants to see how people get adequate health literacy from social media and potentially apply them. Health literacy has been defined by the World Health Organization (WHO) as “the cognitive and social skills which determine the motivation and ability of individuals to gain access, to understand, and to use information in ways which promote and maintain good health” (Nutbeam, 1998, p. 10). The US Department of Health and Human Services (2000) defines health literacy as “the capacity to obtain, interpret, and understand basic health information and services to improve health.” Bodie & Dutta (2008) conclude that to have proper health literacy, people also should have motivation along with the ability to understand information. Besides having motivation to gather information, they also have to be able to understand the abundance of information from social media, blogs, friends, family, and healthcare workers. Individuals with low health literacy gather less health information and face difficulty in understanding that information (Birru et al. 2004). Health literacy also includes people’s “confidence and competence” (Bodie & Dutta, p. 181) to utilize health information from physicians, friends and family, and different media outlets. They have to comprehend the

content that are broadcast in television, radio, Internet, and that published in newspapers and magazines. When a person seeks health information, traditional literacy helps him or her to conceptualize the ideas and develop cognitive skills to process the information, but alone it is insufficient. Citing Dutta-Bergman's research (2004), Bodie & Dutta wrote "traditional health information campaigns contribute to knowledge gaps by choosing information-rich media and crafting information-heavy messages, thus not attending to varying patterns of health literacy in the population (p.182)." Therefore, attending to varied health literacy is a key factor in understanding health issues as it educates, directs, and provides the basis for establishing strong services and selecting media types and developing messages.

Possessing motivation and the ability to gather, understand, and use health information in proper ways should have a positive impact on healthcare. Research demonstrates lower health literacy brings negative outcomes such as poor "patient-physician communication, unhealthy behaviors, reduced treatment adherence, increased risk for disease, and strain on the healthcare expenditures (Bernhardt & Cameron, 2003; Rudd et al., 1999)." Government agencies, health services organizations, healthcare workers, other patients, friends, and family members and media such as newspapers, magazines, television, radio, and the Internet are also crucial for ensuring good healthcare (Breashers et al., 2000; Dutta-Bergman, 2004a, 2004d). Health literacy also varies from source to source as Dutta-Bergman (2004a, 2004d) notes: consumers use these channels to get information, which improves literacy, and the channels may be typed as active and passive. Active channels require cognitive effort from readers, viewers, listeners but passive channels demand low cognitive effort and typically known as less involvement

(Bodie & Dutta, p. 183). Research shows that individuals who have low levels of health literacy tend to use passive channels like television and those who have high literacy use active channels such as the Internet (Dutta-Bergman, 2004a, 2004b, Rudd et al., 1999, Kutner et al. 2006).

As literacy rate around the world is increasing day by day by the rapid growth of technology and fast communication system, today we see people use blogs to share their knowledge to inform, educate, and discuss health issues whereas they used to receive their main knowledge source from mass media such as television, radio and newspaper before. Consequently, there is a change noticed in people's life style. Balslem (1991) in his research arguably states that health educators often call for the reduction of health risks through changes in lifestyle (p.153). As a standard reference work on cancer prevention, she notes that 75 to 85% of all cancers in the United States might be avoided through changes in lifestyle factors such as smoking, diet, and compliance with screening recommendations. "But working-class people often refuse to change their lifestyles, stating to educators that disease is tied to the activity of fate. They are then labeled "fatalistic" and "hard to reach" (p.153). But the project "CAN-DO" educators and other community supporters were helpful in "changing their fatalistic belief" (p.153). As the world literacy is changing towards positive curve since Balslem's time, now the digital forms of communication such as blogs, another factor supporting research into the link between blogs and health literacy, have replaced the old media in disseminating information.

Health literacy includes knowledge and use of a healthy lifestyle, taking measure to prevent chronic diseases such as skin cancer, breast cancer, and other viral diseases

(e.g., SARS, Ebola, and Swine Flu), acquiring first aid skills, and knowing how to look up health information in a library or on the internet. Oakley & Spallek (2012) state the impact of social media in our life is so powerful that it can rapidly damage or uplift the reputation of an institution. The use of social media in companies is ubiquitous: 72% companies use them to promote their business and 90% of them have benefited through it (Bughins, Byers, & Chui, 2011). The use of social media in health care is also prominent: 80% of all hospitals nationwide are using social media to disseminate pertinent client information (Mayo Clinic Center for Social Media, 2015).

Through social blogs, people share health information with each other and educate themselves about various aspects of modern medical sciences. Consequently, the medical community encourages health organizations to use social media to improve health literacy, and studies have demonstrated that increased use of social media can help change healthcare communication patterns by engaging people in discussions, sharing information, and bridging the gaps among the stakeholders (Chou et al., 2009). Oakley & Spallek (2012) in *Social Media in Dental Education: A Call for Research and Action*, wrote that by using social media “Participants are open to receiving new factual information, solutions to problems, learning, and insight.” In particular, the use of social media with the help of celebrities increased “public fascination” (p 281). Social media has the ability to reach millions of individuals “with just a click of the mouse” (p 281).

After conducting a research on adolescents’ and young adults’ new media use in relation to sexual health, Divecha, et al. (2012) stated that the use of Internet and cellphones in the United States has been “ubiquitous” and essential for delivering health information (p 176). The prevalence of social media in the health care industry is

generally initiated by the patient demand for information as they go to Internet sites as a source of health information. They mention that “To promote sexual health among adolescents and young adults, many health organizations are turning to new media—the Internet, social networking sites, and mobile phones—to disseminate information and stimulate conversations about health topics. This innovative approach to health communication has the potential to reach a large audience and trigger dialogue about sexual health attitudes and norms (p 176).” In one study, it was found that 80% of all Internet users go online to seek health information (Hampton, Goulet, Rainie, & Pucell, 2011). And hospitals are adapting social media utilization to promote their health services. McCugthy and et al. (2014) in their research on social media’s impact on health care, found a strong positive relationship between “social media channel utilization” and “patient rating of their overall hospital experience.”

As people go to the internet to seek health information and share their knowledge and experiences in different blogospheres, they would likely obtain information about aspects of health-related issues, including the epidemic disease Zika. Thus, they become educated and informed from different social media or news blogs. People learn from participatory cultures of blogging, as the director of the Comparative Media Studies Program at MIT, Henry Jenkins, et al. (2009) wrote: teens who use the Internet are actively involved in “participatory cultures.” They described participatory culture as “a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one’s creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices (p 3).” In participatory culture, members usually show social feelings and offer contributions, and

these feelings come through affiliation with other members in the community via Facebook, Friendster; they develop new knowledge and circulate that knowledge in forms such as podcasts and blogs. There are many potential benefits in participatory culture including “opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship.” The authors claim the participatory culture of the internet forms a ‘hidden curriculum’ that prepares young people to succeed in school and the workplace.

CHAPTER THREE: METHODOLOGY

Purpose of the Research

This research focuses on the health blogs and framing human health knowledge on them and the main purpose of this research is to find how blogs as social media frame Zika in terms of health literacy. Also, the purpose of this research is to bring together diverse research relevant to health literacy and to identify the framing Zika information. This topic is also chosen because of its timeliness as Zika is still prevailing in many countries, and the pandemic has been found recently in Canada. This research explores how health knowledge through blogs is framed, what kind of information the readers accumulate, and how the gathered knowledge help improve their health literacy. The main research question is how health blogs frame health knowledge/literacy in preventing Zika.

Research Question

How Zika literacy is framed in *The New York Times' Health and Wellness* blog?

Methodology

Framing has been used as methodology to analyze the texts and images of the selected posts. The texts are collected from an online blog: The *Health and Wellness* blog of the “New York Times.” Framing is a consistent way to describe “the power of communicating text” from one location—a speech, novel, news report, television serial, or blog—to another location: human consciousness (Entman, 1993). The communication happens through transferring information from the way the audience apparently sees the text to perceived human consciousness. Entman claimed that the communication process

has at least four locations: the communicator, the text, the receiver, and the culture, and framing involves “selection” and “salience.” “To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Entman,1993). To examine how these diseases are framed in the blogs, this researcher tried to scrutinize the “selection” of communicating texts including the elements of communication, i.e. the context, receiver and communicator, and its “salience” including the meaning and the messages of the texts.

Steven M. Schneider & Kirsten A. Foot (2004), in their article “The Web As An Object of Study,” wrote, social scientists are using different methodologies to explore the socio-political, cultural and economic phenomena of growing digital technologies including the world web wide. The writers state the traditional social research methods such as ethnography, textual analysis, focus groups, surveys, and experiments have been used to analyze both the online and offline phenomena of the internet. Yet scholars face some challenges to implement these methods, as the web is ephemeral in transience (brief in time) and construction (it has to be reproduced by computer in order to be viewed again). Also, while the web has a quasi-permanent form, once it is updated it might destroy its “predecessors regularly and procedurally” (Schneider & Kirsten 2004). So, the ephemerality of the web requires proactive steps, but saving websites is not as easy as saving editions of a magazine. As a result, web study changes traditional approaches of social research, and requires new methods of analyzing form and content, along with processes and patterns of production, distribution, usage, and interpretation. Schneider &

Kirsten (2004) identified three sets of approaches-- *discursive* or *rhetorical* analyses, *structural* or *feature*, and *sociocultural* analyses that have been applied in web analyses for the last three decades. This paper adapted the approach of *structural* or *feature* analyses of websites that is concerned more with the framing of texts of a website than its content alone. This approach focuses on the texts, and images contained on webpages, and takes a broad view of what constitutes text, contribute significantly to our understanding of communicative phenomena on the web. In *structural* or *feature* analyses, the researcher will study the framing of the texts of the *Health and Wellness* blog of the "New York Times" as framing saliently helps establishing the main research question and develops target themes, scheme design, and application to and evaluation of the selected texts (Kaid, 1989).

The images are primarily analyzed by semiotics. According to Jonathan Culler (1976), language produces meaning via a system of signs. He also said sounds, images, written words, paintings, photographs function as signs within language, they communicate ideas. Like texts, images have vocabulary, they make meaning, shape ideas and present reality. In this research, images have been broken down into their individual components, naming each components and understanding how each works as a unit of meaning. According to Thwaites, Davis & Mules (2002), when still image texts are read, two aspects should be focused; a) the *form* of the text, b) the *content* of the text. The *form* is the shape of the image, the way it is appeared to us whereas the *content* is the subjects of the texts, the way the subject is presented to us, they said. Components of the form include *frame*, *lens type*, *film stock*, *camera angle*, *height*, *level*, *distance*, and *depth of field*. They described, *frame* focuses on the size, crop, cut, center of the image. Lens

includes the type of it, as for example; “a telephoto lens can signify voyeurism, giving the impression that you are seeing something you should not see, a standard lens can signify normality, placing the audience at ease, and a wide angle lens can signify drama, placing the audience in a state of anticipation.” *Film stock* focuses whether the shot is digital or created on “film stock.” *Camera angle* is how the image has been shot. *Height* concerns of the height at which the shot was taken. *Level* is aware of the level the camera was on when the shot was taken. *Distance* is about the distance of an object from the camera. This can take a variety of forms including extreme long shots, long shots, medium shots, medium close-up, close up, extreme close up. *Depth of field* is the focus range of the shot. On the other hand, content is “basically inside the frame: the subject of the image and how that subject is presented to us.” Components of the content include the “*subject*, *setting*, and *lighting*.” In terms of *Subject*, it is the focus of the shot, and *setting* is the background; “an indication of the physical and temporal location for the shot,” and *lighting* is how the subject is lit.

Sample

For the convenience of conducting the research, ten selected blogposts and the bloggers’ comments found on Zika in *The New York Times’ Health and Wellness* blog, are chosen as the sample for textual analysis part of this research. There are two segments of this blog site, one is “Ask Well” and the other is general blogging on the topic. In “Ask Well,” the writer poses a question and gives one possible answer through explanation and readers give their feedback on the topic. In the general blog, experts write on the topic and readers share their opinions. The sample posts were basically written during the outbreaks as Zika in the USA in 2015. As the “New York Times” is the most popular US

based newspaper, their blog demonstrates how the outbreaks of the disease were framed in the U.S.. The posts focused on basic discussions concerning understanding and preventing the epidemic.

The “Well” blogposts are listed under the ‘Health’ section of the “New York Times. ‘Health’ pages contain several segments including ‘Well,’ ‘Eat,’ ‘Move,’ ‘Mind,’ ‘Family’, and ‘Live’. In the ‘Well’ segment there are Articles, Multimedia, Paidpost, Video, Interactive Features, and Blogposts. The researcher chose all the blogposts published until November 20, 2017 on Zika as part of social media research. For the authenticity of the texts, the researcher chose to keep the original posts, and bloggers’ given name as they appeared there. As a result, readers will see some misspelling in the text and uncommon names as they were chosen by the writers.

Operationalization

To operationalize the research, the researcher used a set of questions to conduct the textual analysis. The guiding research questions for textual analysis on Zika are:

1. What is the information do bloggers generally share in the blogposts?
2. Is the blog contributing to health literacy/knowledge, especially Zika? If does how and how much? (operationalization needed).
3. What kind of health knowledge do bloggers demonstrate?
4. What and how do the popular expert-driven blogs discuss frequently in their texts to frame health knowledge?
5. What are the key health issues that are discussed in the blogs on Zika?
6. Is the information adequate to prevent disease spread?
7. How is Zika framed in the texts of the blogposts?

CHAPTER FOUR: FINDINGS AND DISCUSSION

In the findings, it is understood that Zika were framed as global threat, global health emergency, national crisis, minimal health risk, preventable and WHO was responsible for it. The multifarious framings of the infectious disease in the social media are presented below as they certainly create an attributed picture of Zika as both educative and dangerous in bloggers and readers mind.

Zika as Global Threat

It has been found that Zika has been leveled as global threat and it has been compared to the deadliest diseases to those people lacked immunity. In a post titled “How Zika Became a Global Threat,” Zika was presented as threat for entire globe. The post depicted an interview of an expert who claimed the virus would spread globally as people lacked immunity. A blogger commented Zika, like Ebola and other viral diseases including SARS, MERS, Avian Flu, human influenza, AIDS are “potential” and “actual” threats to human life. To legitimize the threat more authentically, the post also mentioned that in February 2016, WHO declared Zika as Public Health Emergency of International Concern especially after 2,100 pregnant women were found infected.

In the comments of the post, Zika was also compared with the deadliest HIV and other viral diseases, referring to a comment that claimed Zika will have as devastating consequences as HIV. In another comment, a blogger also wrote he often was disturbed to see the picture of an affected baby. Referring to Olympics 2016 as one of the greatest platform to spread Zika, another blogger perceived Zika as global threat because of “instantaneous” and “non-health” regulated global communication. Moreover, the image

selected for the post was shown in a dark background where one *Aedes aegypti* mosquito was framed in a ghostly manner that resembles a global threat of human extinction.

Blogs help people understand and analyze any issue as they discuss and share each other's knowledge. Thus, they can learn about issues like Zika and take a wise decision on any important issue going on. For example, in a The New York Time's editorial blogpost titling *How Zika Became a Global Threat* published on June 18, 2016 that describes how Zika has posed a global threat from Africa to America. The writer Bikas Bajaj interviewed one of the leading scientific experts on Zika, Scott C. Weaver, the director of the Institute for Human Infections and Immunity at the University of Texas Medical Branch in Galveston to talk about the different aspects of the epidemic. The interview covered how the virus spread and its neurologic defects. The post also talked about how we can eradicate epidemics permanently and deal with future outbreaks.

In response to the post, people wrote differing opinions and reactions, which led to an educational platform about Zika. In a comment Gary James Minter from Las Vegas, Nevada wrote, Zika, like Ebola and other viral diseases including SARS, MERS, Avian Flu, human influenza, AIDS are "potential" and "actual" threats to human life. Referring how HIV become deadliest in central Africa by transmitting to a few humans from a few infected chimpanzees, the blogger also warned in his comment on the consequences of Zika, which would be likely be as devastating as HIV virus as he mentioned, "If medical experts and public health officials had been aware of HIV in its earliest days, and if they had done something about it, millions of people would be alive today, instead of suffering a slow, lingering death from HIV/AIDS."

Zika was shown a big threat for the upcoming Olympics in Brazil in 2014. Rob Page from British Columbia wrote, “Why aren't people talking about many thousands of fans from around the globe becoming infected and taking the virus home with them?” Being concerned about the epidemic and finding ways to control it, Scott from Andover, MA wrote about finding the origin of the virus whether it came from mutation or something else. He wrote, “Shouldn't it be relatively easy to determine if the virus has mutated? It is a virus so it has a very small genome. I would think that it would be easy to sequence virus(es) from Africa and virus(es) from the Americas and determine if there has been a mutation. If there is a mutation that doesn't mean that it is the cause of the microcephaly but if there isn't a mutation, then we know that the cause must be something else about the virus.”

Bill Kennedy from California blames global trade, immigration, and travel as direct result of these viruses. He also claims that excessive carbon emission and global climate change are catalysts of these kind of disease. He refers to an article from Bloomberg, which described how India and other developing countries misuse antibiotics to kill superbug in the chicken farm, which easily spread the resultant viruses around the world. The article says farmers use antibiotic to kill the weak bacteria not the strongest ones, which lead transmission of infection of humans. He writes, “The other major infectious agent, bacteria, are now close to acquiring complete immunity from antibiotics in the worst cases. Drugs produced in the West are abused even worse in developing countries than here, resulting in possibly untreatable infections which are spreading around the world.”

Roger G from New York City writes the number one reason of the virus becoming global threat is “the existence of epidemiologically instantaneous; and, (essentially) non-health regulated global communication.” He says, “Ebola, AIDS, and now Zika, all follow the same pattern, they are carried (largely unknowingly) by living (human/animal/vegetable) or material inoculators.” He feels the protection against infectious disease and epidemic outbreaks is impossible because of high-speed air travel, industrialization and globalization. Thus, the global events, such as Olympic 2016, can offer a platform to spread the disease.

Many of the readers react in a careless way as they think that it is the duty of authorities to protect us from the diseases like Zika as they are paid for that. Martiniano from San Diego writes, “We don't care about Zika. We have heard the cry of wolf a dozen times. If it is a serious threat this time, then the CDC and other health organizations should do what they are paid to do.” But it is not always true that only the organizations have the sole duty to prevent the disease and thus, protect us. Such a feedback makes other readers also careless from their duty.



Figure 1: An Aedes aegypti mosquito. Credit Felipe Dana/Associated Press

The image above from Associated Press and credited by Felipe Dana in the post portrays an *Aedes aegypti* mosquito like a ghostly beast which can kill people with its dreadful bite. In a dark background, the mosquito is placed on something that resembles a globe, which matches the title of the post describing Zika as global threat. The wide-angle lens creates a sense of drama. The picture was well edited so that it can show a threatening image of the mosquito to readers. Though the image ironically makes its reader fearful about the virus, yet it helps readers understand basic information about Zika and improve the capacity to interpret the disease.

Zika as Global Health Emergency

The research also finds that Zika is framed as global health emergency, which posed fearful condition to people. A post titling *WHO Declares Zika a Global Health*

Emergency, a Look at the World's Failed Mosquito Policies written by Andrew C. Revkin and published on February 1, 2016, stated that WHO declares Zika as Public Health Emergency of International Concern especially after 2,100 pregnant women were found infected with the virus. The post also discussed how Brazil was successful in eradicating mosquitoes from its growing cities in the age of urbanization and global mobility. The post describes as Zika is not as bad as dengue and yellow fever during 50's and 60's. In reference with discussing the emergence of mosquito from trash-strewn, puddle-laden cities, resulting in bites during daylight (limiting the utility of bed nets) and posing a peril by carrying a host of dangerous ailments, including yellow fever, chikungunya and dengue, the writer cited a 2011 paper titled "Dengue, Urbanization and Globalization: The Unholy Trinity of the 21st Century," by Duane J. Gubler, professor and founding director of the emerging infectious disease program at the Duke-NUS Medical School in Singapore. Gubler talked about the age of urbanization and globalization, how we can control and prevent mosquitoes in the big cities where millions of people live and become endangered to the infection. The post also cited another paper written by Peter J. Hotez, dean of the National School of Tropical Medicine at Baylor College of Medicine: "A Campaign to Eliminate Mosquitoes Is Needed Until a Vaccine Is Developed."



Garbage piled up on the bank of the Pinheiros River in São Paulo, due to rain.

Figure 2: Piled garbage on the bank of the Pinheiros River in Sao Paulo, credited by Patricia Santos.

In several posts, the bloggers framed Zika as a virus that only grows in big cities' piles of trash, though there are other ways to grow the virus. In a post, the hashtag #ZikaDengueHotSpot depicted images where it is seen how waste piles or other untended spots create a habitat for the mosquito behind these urban outbreaks. The picture portrays the skyscrapers of a large metropolitan, with cues indicating the city is covered by garbage as trash dominates most of the image. The garbage piled by rain water also

symbolizes how the capital, Sao Paulo, is poorly managing the disease. As a perfect place to lay eggs, mosquitos use these areas for breeding. The river water shown in the image looks dirty and stagnant, which can also be an ideal place for breeding. The pile of garbage comprises of used tires, water and soda bottles: the waste management of the country is at stake. To combat such an infectious disease like Zika, a combined effect of countrywide waste and water management are prerequisite.

In another Tweet, an image of Imperial Beach, California was tweeted to show how Zika is bred in the pile of plastic cans and bags, tires and sewage. The image shows a huge pile of garbage on the sea shore and depicts how untidy the area is. A yellow bar that impedes the pile of garbage from reaching further the shore of the California State Park. Being largely populated, the city has also become untidy. The image also shows trash is even reaching the pedestrian of the California's pride, the panoramic hills.



Figure 3: Image of Imperial Beach, California tweeted by a blogger.

In response to the post, bloggers wrote comments. Robert from Out West on Feb 14, 2016 wrote, "It turns out massive outdoor spraying does little to slow down the Aedes mosquito, Zika's main vector." He mentions the mosquitoes' reproduction happening in buildings right around them, even in closets and in the debris we leave around, posing a question: "Guess what the best control measure is? A hint: it's not spraying." Responding to his comment, another blogger named Adrian O wrote as a child he remembers, "For school vacations out of town, there were always in the family luggage a Flit pump and a bottle of DDT." On reply, Robert wrote, "That certainly explains some things."

Another blogger named Clear Gardener from London wrote rubbish is a great problem when dealing with mosquito and other insects and mammals that spread diseases. Referring his company website, which worked on the impact of the waste on the environment, he claimed it is equally problematic for both tropic and colder countries. He said his company "deals with the problem by promoting environment awareness among its employees and customers and organizes events to rid London of the abandoned junk."

Birds Transmit Zika

Some posts are also framed in such a way that show Zika transmits through several ways including climate migrations, mosquitoes and birds as Susan Anderson from Boston quoted,

"While Asian and European birds don't migrate into North America, they can pass on viruses to birds that do. That could happen in a place where millions of birds from both the Old World and New World are instinctively drawn every spring: The Arctic lands surrounding the Bering Strait, known as Beringia. In the past, New and Old World birds in Beringia visited numerous ponds spread out

across the tundra. But with temperatures in the Arctic rising twice as fast as anywhere else, conditions are changing rapidly, shifting the distribution of creatures and their pathogens” (How Zika Became Global Threat, comment 6).

From the post, it is understood that because of temperature birds are moving from arctic to tropical areas and when they return, they take viruses with them, which causes the epidemics. It has been seen that the segregated species are coming into new kinds of contact. Since climate change force birds to migrate earlier and farther, feeding at new times and in new places, they overlap with other bird species in unprecedented ways that “pathogens” can exploit. Another blogger wrote how the migratory birds flying to Asia bring virus from poultry. He said,

"Migratory birds picked up the virus from a poultry farm in Asia ... into Siberia and Beringia for the breeding season. There, whether it was because of the new intimacy of the changed landscape, or ... something about the virus itself, the pathogen spread into other bird species, including those that would later head into North America ... By December 2014, they had brought the virus into British Columbia, Washington and Oregon, infecting wild and domesticated birds along the way and igniting the epidemic" (How Zika Became Global Threat, comment 12).

Birds returning to North transmit many harmful viruses causing infections into other wild animals. However, Wmar from USA, in his reply to the comment, provided 20-year data on climate change from mainstream global data-sets, terrestrial, ocean, and via satellites. To focus on the real issue and the outcome of climate change he wrote, “UAH shows the arctic or north polar region as having no warming for 13 years and 10 months, (RSS

essentially agrees)-so there goes the migratory argument at least as per climate change.” Climate change is the real cause of that mass migration, which brings us inter-continental issues of viral infections over the time.

Mosquitoes are the deadliest insects that bring a lot of new viruses and cause human existence into question. Here, another blogger writes about how mosquitoes spread many diseases. Reminding us we are a long way from any "magic bullet," Lee Harrison from Albany, NY wrote,

“Mosquitoes are an incredibly sophisticated evolutionary product. So is malaria, so are the mosquito-borne viral diseases. It's a big world and new disease organisms appear steadily; our modern transportation allows them and their vectors to explode quickly. Neither *A. aegypti* nor *A. Albopictus* is native to the new world, for starters” (How Zika Became Global Threat, comment 18).

As human beings are affected and they transmit the virus from place to place too. There are some suggestions from bloggers that pregnancy in the period of epidemic should be controlled as Rosemary Freitas from Ann Arbor, Michigan wrote, “Uncontrolled development has led to woefully inadequate sewage and trash handling making vector control, I am sorry to say IMPOSSIBLE.” “Even though a reducing pregnancies during this awful time would be beneficial to our crowded planet, ultrasound detection and abortion are rarely available to the poor in these ‘catholic’ countries.”

If we can manage the unpredictable growth of these little insects, we in many ways can control diseases like Dengue, Malaria, Zika and so on. Barefoot Boy from Brooklyn claimed not to equivocate about DDT. He says,

“Yes, it's true that "...countries in the American tropics dealt a huge blow to *Aedes* mosquitoes in the first half of the 20th century, but then – only partly because of the ban on DDT-dropped their defenses..." A successful mosquito eradication program depends on a systematic approach, involving public education/community outreach, waste management and drainage, screening, and other measures. But massive fumigation with DDT and/or other insecticides, urbanization notwithstanding, is a NECESSARY component, no two ways about it, unless and until an effective genetic or other method of vector control, or a vaccine, is developed” (How Zika Became Global Threat, comment 15).

Community education, waste management, vaccine development and proper drainage system are the prerequisite of controlling such epidemic disease like Zika.

Zika; WHO is Responsible

In some blogposts, World Health Organization (WHO) has been considered responsible for Zika as in post-2 titling *The World Health Organization Needs to Be in Charge of Zika*. Suerie Moon, the study director of the Harvard-London School of Hygiene and Tropical Medicine Independent Panel on the Global Response to Ebola, and professor of global governance and health at the Harvard T.H. Chan School of Public Health and Kennedy School of Government wrote

“With the ink still wet on various reviews of the global response when an unprecedented Ebola outbreak spread across West Africa, Zika reminds us that we are still not ready to handle emerging pandemics. The World Health Organization was widely criticized for being asleep at the wheel during the Ebola outbreak in

2014. Now WHO has to prove that it can take charge of dealing with Zika”

(WHO is Responsible, para 3).

She also argued sending teams to America to care for patients and spraying mosquitoes is not the only task for WHO, rather bringing other stronger actors from Latin America along with CDC can play a vital role in facing this epidemic. In the article, she suggests “WHO should analyze the sensitive outbreak information that governments must legally share with the agency, and provide authoritative guidance on how best to counteract the pathogen.” She proposes WHO protect public health, bring together the world’s best scientists to advance understanding of the virus and mutation, coordinate labs, pharmaceutical companies, research funders and governments to develop drugs, diagnostic tools, and vaccines against Zika, to avoid wasteful duplication and enable faster scientific progress. Delineating the role of WHO, which started mapping Zika-related research and development initiatives worldwide, Suerie also wrote,

“On Thursday, WHO’s director-general, Margaret Chan, made the welcome announcement that she is convening an emergency committee on Monday to assess whether Zika should be declared a public health emergency of international concern (the designation that was given to Ebola after too many months’ delay)”

(WHO is Responsible, para 3).

As the situation was getting beyond control and WHO officials became more concerned with the epidemic, which is rapidly grasping a lot of regions. So, it was an urgent decision to declare the Zika situation as emergency.

While, in response to the post, blogger J. Rozo from Sao Paulo, Brazil blamed governments for the Zika-Microcephalya and the birth defects from women vaccinated with a faulty batch of Rubella. He said Zika is normal in Africa whereas it is worst in northeast Brazil where mothers took the vaccine. Another blogger, Jean McMahon from North Pole, addressed women from infected areas as “poor women” and asked them not to get pregnant, while Frank from Houston, asked to get rid Margaret Chan of WHO, writing that “Her timid and foot-dragging approach to Ebola, and now, perhaps to the Zika crisis demonstrates her lack of leadership and sense of urgency.” Himillermd from Stanford, CA shared a link about controlling disease-causing mosquitoes titling *We Can Beat Zika And Malaria--If The FDA Allows*.

Furthermore, some bloggers wrote about the authority’s initiatives and praised their work for Zika prevention. Appreciating the steps taken against Zika, Howard Williamsburg from VA wrote, “Based on recent reports mosquitoes and ticks are becoming increasingly important as vectors of emerging viral and bacterial diseases. Aside from malaria, I have not seen very much of an organized response to combat the vectors themselves.”

Caleb from Portland, Oregon praised New Times Wellness blog for its detail writings and asked the paper to show them proper guidelines and facts about Zika. The blogger also stated the picture of affected baby disturbs him a lot: “Clearly the effects of Zika on a newborn are utterly horrible.” Urging the US government to take the necessary step to stop this dreadful epidemic he writes, “We certainly owe it to our citizens to protect them from this disease and we owe it to the world as well. The United States has

the most resources and expertise to deal with this awful threat and clearly most Americans would like us to do all that we can.”

Zika as National Crisis

It is found in the posts that Zika has also been declared a national crisis in many Latin American countries as in a post titling *Covering Zika in Hushed-Up Venezuela*, Evelyn Nieves discussed how badly Zika virus hit Venezuela resulting various crises of basic supplies including food, water, medicine, gauze and needles. The post also described how the mosquito-borne infection hit the Latin America hard, including Venezuela’s neighbors Brazil and Colombia, estimating approximately 2 million people in danger of infection by the end of this year. Quoting a journalist, it also says, how the government is giving faulty figures and barring journalists to access of information about the victims, as the authority thinks journalist would sensationalize it. Though the number of infection cases in Venezuela has not been documented, it is shown that Brazil estimates 1.5 million people have been infected while Colombia has registered close to 43,000 actual cases. Furthermore, Venezuela official estimate remains at 5,000 cases, while a Venezuelan Society of Public Health estimates more than 400,000 cases.



Figure 4: An Aedes aegypti mosquito viewed through a microscope in a laboratory at the Venezuelan Institute of Scientific Research.

The above picture came with the post shows a close-up shot of an Aedes aegypti mosquito in a Venezuelan lab depicting the crisis with a microscopic view. In a lab, where all other instruments are scattered and the only focus is on the virus carrier, it is understood that the scientists are trying hard to find a way out of this disease. The mosquito with its striped mark and eight long, open legs on the lens is a bit scary, telling us a story of unknown danger.

The post reports that the government says Venezuela has no cases of babies born with microcephaly while “Brazil has put the world on notice, releasing photos and videos of new mothers holding babies born with the devastating syndrome.”



Figure 5: A man covered his face after a fumigation truck passed through the street in the Petare slum in Caracas, Venezuela. Credit Manu Quintero

The image above depicts a man covering his face after a fumigation truck passed through the street in a Caracas slum. The little light in the picture resembles how the darkness is symbolically grasping the slum and the countries with the virus and the bringing despair and darkness. The image indicates the situation is worsening and people are fighting the disease but no light of hope is seen yet. The governments in the region show tendencies to conceal the crisis but in response to the post, Marina from New York wrote, “Whether there have been 5,000 or 400,000 cases of Zika, if the government says Venezuela has no cases of babies born with microcephaly, doesn't this call into question the theory that Zika causes microcephaly?” Also a blogger named Alpha from Europe mockingly replied, “Because Venezuela's government statistics are so reliable and certain

to report the facts as they are, eh?” It may be understood that such a portrayal of a pandemic diseases on mass media does not control the situation but rather worsens it. People get scared easily, resulting a very critical milieu in overall Zika prevention.

Zika as Minimal Health Risk

In some blogposts, Zika has been portrayed as minimal health risk resulting in no serious harm. Christian M. Pettker, the chief of obstetrics at the Yale School of Medicine and Yale-New Haven Hospital said before answering all the necessary questions on Zika whether it really cause serious birth defect in all pregnant women, or we have adequate tests for Zika, or the exact data of the number of infected people. Since not all women pregnant with Zika infection has a baby with microcephaly, we cannot say all women in the areas with Zika are so direly vulnerable to the infections and they all need contraception for the moment. “Of course, the strategy for communicating it, along with its rationale, will be the key for getting it right, along with providing the resources for answering the unknowns as soon as possible,” he said.

Being confused why some educated readers in NY times take the Zika matter lightly, a blogger named A Goldstein from Portland thinks there is no medical specialty more fraught with uncertainty than epidemiology. He said, “Any expertise about how a disease like Zika virus is distributed, transmitted and affects people is subject to modifications from numerous factors including virus mutation, human genetic variability, new transmission methods and of course, even the weather.”

Many believe consequences of Zika are exaggerated. Rob-Chemist from writes, “Other than for the fetus of a pregnant women, the virus appears essentially harmless with only very mild symptoms.” The blogger said, we can’t stop Zika spread but we can

slow it. The blogger also suggested, getting infected well prior to becoming pregnant will prevent an infection while pregnant. “Within a couple years, this virus will just be a background infection like so many others (Rhinovirus, West Nile virus, various herpes viruses, etc.) that we learn to live with,” predicted the blogger.

A blogger wrote that except for the fetus of a pregnant woman, the virus is harmless and we will forget it within couple years as we did in so many other cases, like Rhino virus, West Nile virus, various herpes viruses, etc. Another blogger named Moderate from Texas, wrote unless we answer all the questions including; can the virus transmit through semen? or how long will it remain in men’s semen? how long does it remain in women’s system? or can other type of mosquitoes absolutely not contract the virus? the scary potential will remain with us. Furthermore, a blogger named Frugalfish from Rio De Janerio wrote Zika is less harmful than the normal cold, except for the matter of microcephaly. Another blogger, Nancy said we have to know about Zika immunity: is there a test for antibodies yet? Winthrop Staples from Newbury, CA mentioned none of these questions came from our politicians or medical officials but the public. Because of an open border for economics, the situation gets worse and sometimes it is recommended to close the borders of infected areas.

Dennis Mueller from New Jersey wrote, Zika can cause some problem for women but nothing on the scale of microcephaly. Blaming the health officials for placing the burden only on women, Ashley Smith from San Antonio said, “Why aren’t men in affected areas asked to avoid getting women pregnant and encouraged to use contraception?”

A blogger named TomP replied that the issue was addressed in an NPR report. She said, many tropical countries are unfriendly to women's rights, but Brazil warned men on the risk of Zika infection. Also, Jose from Rio de Janeiro wrote, "Nobody is putting the burden on the women. For people in a relationship, conception is a consensual decision, but women can and do get pregnant outside of relationships, sometimes knowingly and with people they do not wish to see again (produção independente, it is called here in Brazil). Nothing more reasonable than to warn those who must actually carry a baby in the womb for 9 months." Nancy said, "There will always be poor people. Next solution?" while Tired Hypocrisy from US said, he does not think Zika will be eradicated as long as poverty exists.

Zika as Unstoppable

Zika has also been framed as unstoppable in some posts. Steve Singer from Chicago thinks it is unavoidable at this point as climate change, human mobility and trade are growing too fast. He said, "Among Climate Change's downsides, too numerous to list, is the evolution of new pathogens that will spread quickly and widely. New diseases from Africa that suddenly explode as if from nowhere without warning in overpopulated South America, Southeast Asia, South Asia. Thank human mobility. Trade and travel." He believes, those new pathogens will threaten the entire population of the earth while most live in poverty and stress. "Zika" damages fetuses during the first trimester, limiting their lifespans and eliminating their reproductive potential. New strains of malaria will reinvigorate that ancient, lethal scourge. But my money is still on "Ebola", on an evolutionary path that will take it from African rainforest to every large impoverished city slum in every poor, overpopulated Third World country." The history

of pandemics in the course of recent history led to numerous mass death incidents as the Plague of Justinian (Smallpox from South Asia or the earliest waves of Asian Pneumonic Plague, known as Medieval Europe's "Black Death") killed at least a third of the empire's population. "Today, Brazil's population is 209-million. Were a new Plague of Justinian to run wild there like Zika, same die-off rate, that's 70+ million dead in a short period of time. Venezuela, in economic collapse, 32-million people, 95% poverty rate, 12+ million dead. Then, it moves into Central America and Mexico. Then here."

Zika as Preventable

Like other mosquito borne diseases, Zika is preventable. Brazil was successful in controlling the mosquito in fast growing cities in the epic time of globalization and urbanization. Because of high-speed air travel, industrialization, and globalization, the control of these kind of diseases is not possible but it is preventable.

On the Wellness blogpost, there is a debate posted on the Opinion Page called *Room for Debate*, where four health professionals argued their points on the topic of "Stopping the Spread of Zika" and readers commented on the debate issues. The World Health Organization warns 4 million people could become infected by the virus by this year and believes Zika causes serious birth defects in new born babies. So, the debate is based on how we can halt the spread of Zika virus in the Americas, and around the globe.



Figure 6: Aedes aegypti mosquitoes, which spread the Zika virus; Getty Images

The clearly focused image of two Aedes mosquitoes in the above picture depicts a vivid warning of the epidemic threatening the entire globe. To remove these consequences, Peter J. Hotez, a professor of pediatrics and molecular virology and microbiology wrote, “A Campaign to Eliminate Mosquitoes Is Needed Until a Vaccine Is Developed.” He wrote, in 1940’s the Pan American Bureau tool an ambitious insecticide plan to eradicate dengue and yellow fever transmitted by Aedes aegypti that is likely to be the major vector of Zika virus today. Between 1947 to 1962, the use of DDT eradicated Aedes mosquitoes from 18 Latin Countries and dengue fever was drastically reduced. DDT was no longer applicable in certain countries as the mosquitoes returned to Cuba in 1981. The writer proposes two pilot studies to evaluate novel technologies until a safe and effective vaccine for Zika can be developed. They are: genetically modified mosquitoes and mass drug administration. He said,

“With a strong global health leader to coordinate a mosquito eradication campaign, pilot studies and the pursuit of a vaccine, it might be possible to make a major dent in the rapidly spreading Zika virus now decimating the Americas” (Stopping the Spread of Zika, para 2).

Several posts talked about the ways to prevent Zika in a response to the writer’s arguments. John from Washington wrote, “There is a wealth of information on addressing mosquito borne diseases. Mosquito control, bite prevention and public education need to be addressed as ‘defenses in depth’.” In terms of mosquito control and prevention of the virus, he said,

“Mosquito control includes habitat reduction, larviciding to kill mosquito larvae or pupae in the water and adulticiding to kill adult mosquitos, which is often the least effective control. Adulticiding may need to be pursued in the midst of a disease outbreak, and it offers some local control in the midst of an environment where habitat reduction may not be effective. Larvicides and adulticides can be distributed from the air for larger or inaccessible areas” (Stopping the Spread of Zika, para 3).

The post suggests prevention is the most important aspect that is needed to be done in this situation. Habitat reduction, adulticiding, and larvicides are the measures can take in terms of preventing mosquitoes. Bloggers discuss also discuss many other dimensions to enhance the prevention systems. They mention mosquito bite prevention includes physical barriers such as clothing, netting, window and door screens, etc., and chemical barriers such as repellents. Mosquitoes may land but not bite with DEET. Bite prevention is a critical control on people who have a disease that can be spread. Widespread

distribution of products like netting and repellents along with public education may be needed to address disease outbreaks. June Conway Beeby from Kingston, ON, emphasized more research on microbial or viral as Canadian climate is changing into a warmer environment, where mosquitoes thrive like southern countries.

Suggesting herbs as medicine for Zika, Stephan Brown Brewster, MA wrote, “ALL of the suggestions herewith are based on Big Pharma and Big Med. and there is NO suggestion of looking into "the world's oldest medicine"-- the plants. Botanical medicines are far more complex and effective than most pharmaceuticals for most health conditions.” He also said herbs are not being explored as big Pharma could not make billions of dollars off sick people.

Another blogger named MarkH said, “A travel ban would be a rather weak way of arresting its spread, and would have heavy human costs, not just monetary.” He also said, Zika is sure to reach US no matter how high Donald Trump builds a wall on the Mexican border. “The good news for the US is that because of our wealth, we will be able to control infection rates well, and the number of Americans infected in-country is likely to remain small, and the number of malformed infants mercifully should be very few,” he said.

In the process of educating readers about Zika and its deadliest spread, some relevant Twitter posts were discussed as part of other social media related to this post. In one Tweet, a mapping of Zika, the range of *Aedes aegypti* mosquito and more are shown. The red dots in the image indicate the most affected area is the central American countries while the disease was spreading towards the U.S. and other parts of Latin America.



Figure 7: Map of Zika alerts taken from Twitter post

A blogger named DontDenyTruth from Nashville suggested the use of DDT as it was huge success to eradicate dengue in Latin America earlier. On the other hand, JerryV from NYC wrote first of all we need to find the transmitter of Zika and before using DDT, we need to know where we should or should not use it. He said,

“A. aegypti can be a relatively easy mosquito to control. After Yellow Fever was shown to be transmitted by aegypti in 1900, mosquito control eliminated the disease from Havana in fewer than 90 days. This was followed by a mosquito control campaign that allowed construction of the Panama Canal. A. aegypti is largely an urban mosquito that develops in water-filled containers around houses. A more important vector seems to be the “tiger mosquito”, A. albopictus, a significant transmitter of Zika in Central Africa. A. albopictus is largely a forest dweller, making it more difficult to deal with. Furthermore, albopictus tends to bite and then move on to bite another host. A. aegypti prefers to bite humans,

whereas *albopictus* bites a wide range of mammals and birds; this makes it essential to do epidemiological studies to search for possible non-human reservoirs of Zika” (post 5).

In controlling the epidemic, a blogger wrote that an epidemiological study is needed to determine the significant vertebrate reservoirs and mosquito vectors to find out who and where the guilty parties live, and how they should best be dealt with. Showing a natural path to eradicate the natural disaster, David Joines from Kansas City, MO wrote, “This is a simplistic answer, but nature provided an excellent mosquito control system in bats. But people don't like bats, so people have done what they can to remove bats from human-populated areas. Thus mosquito populations grow, and people use insecticides to get rid of those pests. We never seem to care much what happens to the planet so long as we can get rid of any nature we don't like. With White-Nose Syndrome doing a number on bat populations in the eastern U.S., we are losing even more of the poor animals. This is a simplistic answer, but nature provided an excellent mosquito control system in bats. But people don't like bats,so people have done what they can to remove bats from human-populated areas. Thus mosquito populations grow, and people use insecticides to get rid of those pests. We never seem to care much what happens to the planet so long as we can get rid of any nature we don't like. With White-Nose Syndrome doing a number on bat populations in the eastern US,we are losing even more of the poor animals” (Stopping the Spread of Zika, comment 9).

While a blogger claimed Zika is not preventable, Robert from Twin Cities, MN asked the commenter not to worry as he said, many people infected by Zika have no

symptoms or very mild ones whereas Steve replied, saying that no pathogen is static and the long term picture is unknowable yet, so he thinks of Zika as the canary in a coal mine.

Bentsn from Lexington Ma wrote, "It would be much more effective than using DDT to release Wolbachia infected *Aedes aegypti* mosquitoes in the wild." Referring an article, he said, "With the threats of Zika and Dengue viruses it is time to get over our reluctance to release modified mosquitoes." In addition to that, RHE from NJ, wrote, approval for release of *Aedes* suppression gene drives is urgently needed and it is easier, faster, cheaper, and more effective than insecticides with no credible downside.

Nana2roaw from Albany wrote, "When he was young before the Rubella vaccine, parents would purposely expose their young daughters to other children with German measles. Being infected with the Zika virus while not pregnant does entail a small amount of risk but considering the potential damage to babies, why is this not being considered." Eric from Massachusetts wrote, "Mosquito control should be part of the strategy, but what a choice here, to those who resist all release of genetically modified organisms. There are substitutes for long-persisting DDT but there is no known pesticide that targets a specific mosquito species. The spraying proposed here will kill hundreds of non-target arthropods, including butterflies, bees, spiders, and other pollinators and biocontrol species. We call arthropods "bugs," birds call them "food". Spraying would have to be conducted in sustained fashion over large areas if the goal is truly to eradicate the two problem species. In contrast, the release of genetically modified individuals of the two target species -- also in sustained and widespread fashion -- is truly targeted. Ecologically, the GMO approach is the wiser."

In a discussion, Amy Y. Vittor is an assistant professor in medicine at the University of Florida's Emerging Pathogens Institute, suggested by alleviating urban poverty we can tackle the Zika virus. She said because of sanitation and use of air conditioning in the US, the virus is unlikely to create outbreaks, but the scale of the outbreaks in central and south America is more because of poverty. She argues, "Lack of running water and waste management, in conjunction with urban crowding and poor housing, has given rise to the perfect set of conditions for the transmission of such mosquito-borne viruses. Mosquito control measures and heightened surveillance are absolutely critical in the immediate response, but to address the underlying conditions that give rise to epidemics such as Zika, we must address urban poverty." She indicated some parts of Texas are very susceptible to Zika outbreak as a blockage of water and waste management service led to the dumping of untreated waste water into open air canals and drains. "Fundamentally, we need to address the underlying factors that lie behind the emergence of not only Zika, but also other mosquito-borne viruses that have had a high burden of morbidity and mortality around the world. Increasing access to basic needs such as running water, waste management and improved urban planning is not a quick fix, but neglecting these issues puts us all at risk."

In response to the post, Victor Vuong from Orange, TX wrote, "Although eradicating urban poverty may not be a "quick fix," it is still of great importance and should not be ignored in the moment. Currently, scientists are supposed to be researching this new unknown disease that has not yet gained the same notoriety as ebola, but it won't stay that way for long. Hopefully the disease will be contained within a short period and timely manner, but the issue of poverty, especially in more urbanized areas, still remains

and must be addressed regardless of current problems.” Katieatl from Georgia mentioned alleviating urban poverty is insufficient, rather we have to establish world peace and eradicate illness, while RHE from NJ said Eradicating *Aedes* spp. would be easier, faster, and effective at fighting Zika than trying to end poverty. Frulgalfish from Rio de Janeiro advises to cover the container including old plastic and rubber tires as *Aedes* live on the stagnant water, not in moving water. Describing the importance of public health fund, James David from Fort Pierce, Florida wrote, “Puerto Rico needs a massive infusion of public health money to fund backyard control measures. Similar to what Cuba did when they had a dengue outbreak a number of years ago.”

As a solution to stop spreading Zika, a blogger named, Bentsn from Lexington, MA wrote, “We should be releasing *Wolbachia* infected *Aedes aegypti* mosquitoes. *Wolbachia* will spread naturally in the wild mosquito population and dramatically reduce Zika and Dengue transmission.”

Sharing a link another blogger, Steve Milloy Potomac, MD referred to Dichloro-diphenyl-trichloroethane (DDT) to kill Zika as immediate solution whereas Jaginsburg from Chicago wrote, “Zika, like most disease outbreaks over the last several years, has had a significant human-mediated component. In fact, this was hundreds of years in the making, if you take into account the repeated introductions of invasive vectors. The drought—exacerbated by El Niño, climate change and deforestation—has forced people, especially the poor, to save water however they can, creating a bumper crop of mosquito breeding opportunities. In “Rats, Lice and History,” written more than 80 years ago, Hans Zinsser connected the dots between trade, travel and disease outbreaks, so it should be no surprise that many suspect a link to 2014’s World Cup, which brought 3 million + people

from 90 countries (and their stowaway mosquitoes) to Brazil. Public health and economic health are inextricably tied to environmental health. We're need to break down the silos and be proactive if we're ever going to get ahead of the increasingly shocking, dismal and horrific headlines.” He shared a link related to Zika which was titled "Zika: Of Virus, Vector, Victim, Drought, Deforestation, the World Cup, the Epigenome & Evolution." Furthermore, Ned Kelly from Frankfurt responded, “El Salvador has recommended delaying pregnancies until 2018, which could provide an example for other nations to follow. Brazil could also delay the Olympics till that year. Although drastic, better to be safe than sorry.”

Therefore, it is clear that the framing of Zika virus has taken several forms. Yet, the blogposts and comments help our understanding of Zika issues as they educate, direct, and prevent disease spread.

How Zika is Framed in the Blogposts

The analysis of the texts of the selected blogposts suggest that by portraying Zika simultaneously as a(n) (inter)national crisis that also has minimal risk, unstoppable but preventable, demonstrating varied framing. Such varied framing shown in the posts are actually reflections of mainstream media which concurrently portrayed Zika is not only national but also global threat. This happened because media sometimes overemphasize on an ongoing issue and set its own agenda. Though, the primary objective of media is to warn people about the ongoing issues but with the stream of news on the issues, they take them into different paths which bring negative impact on readers. Such a framing of any topic proves Entman’s (1993) claim that as process of the four communication locations (communicator, the text, the receiver, and the culture), framing involves “selection” after

selecting aspects of a perceived reality and making them more significant in a communicating text, in such a way as “to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described. It also offers paradoxical stances. Showing the disease is unstoppable and preventable at the same time, it uses a selected framing, which brings a conflict of interests among readers leading to a critical situation. These selective texts produced a misrepresented salient picture of Zika. Readers around the globe have a perceived fear of the disease as communication happens through transferring information from the way the audience apparently sees the text to perceived human consciousness. As social media has been so prevalent in our lives, the framing of such depictions matters in to a media critique. But, even if readers become puzzled by such portrayals of the disease, yet they are educated readers with literacy in health.

CHAPTER FIVE: CONCLUSION

It has been found that bloggers shared, sought and disseminated knowledge about various issues of Zika. Thereby, they know about new disease controls and how to deal with such a pandemic through sharing their views and ideas to each other. The study sheds new lights on questions concerning how Zika has been depicted in *The New York Times*' health blog and contributes to existing knowledge in five ways. First, this study finds Zika is sometimes described as preventable with minimal health risks, which tends to encourage readers to take the pandemic lightly. Second, Zika is portrayed as unpreventable, as a serious global threat, which creates a fearful milieu among readers and other stakeholders. Third, this study also classifies mosquitoes that cause Zika as primarily grown from piles of waste in large, urban areas, creating a stereotypical image of big cities. This is misleading, as the mosquitoes do not have a particular habitat. Fourth, the study demonstrates the focus on the World Health Organization as solely responsible for controlling the disease, but in reality, every government and its citizens have the duty to make sure they prevent Zika infestation. Fifth, it is found that most of the images edited and focused on a portrayal of the mosquitoes that highlighted fearful aspects. Such a depiction of fear and anxiety through images misleads readers and increases worries about disease control and prevention. Furthermore, *The New York Times* is one of the most renowned and circulated newspapers around the globe and its readers and bloggers are educated and socially conscious. From the comments, it was noted that they represent different geographic regions. However, it can be argued that the readers of *The New York Times* represent a higher-class range of the population, thus the blog will have the limitation of not being varied, in the sense that Dutta-Bergman states.

It may reach opinion leaders, but it is not a form of health literacy that encompasses varied populations.

As a very interactive and participatory platform, blogs offer readers the opportunity for quick and educative feedback. The posts help readers to gather proper knowledge about Zika as the World Health Organization (WHO) intends, and the cognitive and social skills determine the motivation and ability of individuals to gain access, to understand and use information in ways to promote and maintain good health. In this research, Zika were framed as global threat, global health emergency, national crisis, minimal health risk, preventable and WHO is responsible for it. Such framings of the infectious disease in the social media obviously create an attributed picture of Zika as both educative and dangerous. The contradictory aspects of the disease offer the frame of an issue that is still in early stages and being formulated, encouraging blog interests and opinions.

Despite all the misrepresentation of Zika, there is a wide range of possibilities that both bloggers and readers have an extensive platform to learn, discuss, and share their knowledge of the epidemic and thus, they become literate on the topic. They commented about disease prevention saliently and gave insightful and natural feedback on the crisis. Yet, to have full participation and understanding of how media shapes perception, different aspects such as the participation gap, the transparency issue, and the ethics challenge need to be addressed in detail. The ephemeral nature of blogs is also something to consider: as one blogger noted: “it seems like this blog section is dying anyway. Too bad, really, it used to be a great forum for exchange of ideas, but having to wait until an article is off the main page for one's comments to be printed kind of

eliminates any conversational aspect of commenting.” A related study would include the effects of the transient nature of the blogs on health literacy. Through participatory culture (see page 12) of bloggers, readers, and other healthcare stakeholders, where they share, learn and educate each other, the researcher learnt about the framing of Zika. As literacy plays a vital role in changing the game plans, it is understood from the discussion and findings that blogging about Zika also can bring potential effects in Zika patient treatment, management strategies, patient recognition symptom, patient care, diagnostic and therapeutic procedures, and adherence to preventive measures and medications.

Furthermore, this study provokes the researcher to think further and conduct broader research in the future. Finally, by conducting the research broadly it would be possible to understand the roles of popular media blogs in preventing new diseases and helping people to be knowledgeable about them and cope in related adversities. The researcher has a plan to conduct an audience analysis to better understanding the broader realm of this area.

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