

**Zika Discourse in American Media:  
The Language and Framing of a Public Health Crisis**

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**ABSTRACT**

The Zika virus is a mosquito-borne and sexually transmitted disease that became an epidemic in South America in 2015 and spread to the United States in 2016. How American newspapers talk about and frame the Zika virus influences how the public understands and reacts to the disease and how governments respond to the disease. The characteristics and frames of media discourse and the inclusion and exclusion of certain communities and ideas reflect relations of power and social inequity. I collected relevant articles from the *New York Times*, *Miami Herald*, and *Dallas Morning News* between January 2016 and January 2017 by searching “Zika”, and analyzed them for common themes and patterns in framing, language, and content. The *New York Times* primarily focused on international issues, while the *Miami Herald* and *Dallas Morning News* focused on more locally relevant issues regarding Zika. Five common discursive frames were found in the articles: the medical moment, economy, environment, women, and development. The medical moment frame was the most prevalent, while the women and development frames were often only implied from language and phrasing. While limited by the scope of newspapers and the newness of the Zika Virus in the United States, understanding how these discourses are presented and characterized has important implications for government policy and public health responses, and also contributes to the greater understanding of how power and oppression operate in the context of public health crises.

**KEYWORDS**

Othering, Emerging Diseases Worldview, Gender, Capitalism, Medical Moment, Insecticide

## INTRODUCTION

The Zika epidemic is a growing threat around the world, with severe consequences for public health and less visible issues of economic and social equity. The virus originated in the Zika Forest of Uganda, and has been endemic to areas of Asia and Africa for almost seventy years (Fauci and Morens 2016). Like Dengue Fever and Chikungunya, Zika is transmitted through the *Aedes Aegypti* mosquito, but it can also be sexually transmitted (Moreira et al. 2016). Zika poses a great risk to pregnant women and those planning to become pregnant, as the virus is correlated with birth defects such as microcephaly and arthrogryposis in newborns (Sikka et al. 2016, Linden et al. 2016). Likewise, Zika is a risk for sexually active men because the virus can persist in semen for possibly up to three months (Mansuy et al. 2016). However, Zika is a concern for the general population, as infection is correlated with Guillain-Barre Syndrome, a neurodegenerative autoimmune disorder, and because the health of vulnerable individuals depends on the health of their greater community (Cao-Lormeau et al. 2016). With the virus' entry into Latin America and the Caribbean in the summer of 2015, Zika has become an increasing threat to the United States. Zika exists in all fifty states due to travellers carrying the disease from endemic areas, and has become endemic to areas of Southern Florida and Texas ("Maps of US Zika Cases" 2014). However, beyond the immediate and intensifying health threat, Americans are experiencing Zika economically, socially, and through other indirect effects (Fauci and Morens 2016).

Zika differentially affects people and communities across the United States due to variation in socioeconomic status, geography, gender and race, reflecting systemic issues of social and racial inequity. These different experiences are associated with narratives regarding Zika in media - whether on Facebook, in newspapers, or on the radio. These narratives contribute to the greater discourse of Zika - both the "language associated" with Zika and "meaning-making as an element of the social process" that shapes how Zika is understood (Fairclough 2013). While discourse serves to circulate these narratives and inform the public about the Zika Virus, various discursive frames (patterns in how discourse is represented and framed) can affect public perception of Zika (Zhou and Moy 2007). Framing is a sub-category of discourse and refers to "how the content of a text is presented, what sort of perspective (angle, slant) the writer is taking (Huckin 2002)." Additionally, because the media has a unique role in framing and representing

these narratives, and because it acts as a powerful conduit between government and the public, it can be particularly influential in focusing public opinion and government policy on certain issues (Robinson 1999). Discourse and framing can influence how people and governments associate the disease with certain actions, communities and geographies and how people respond to government prevention measures. Language can also work to reproduce or destabilize power relations locally and globally between individuals, cities, nations, and international organizations. Including or excluding particular narratives in media can perpetuate or alleviate certain inequities of Zika, and can have tangible affects on how people experience Zika based on race, gender, nationality, and socio-economic status.

Effective public health policy and responses to Zika must consider how these discursive frames interact to make some voices more important than others in shaping policy and public opinion, while some perspectives are excluded. Recognizing that these discursive frames are situated in pre-existing power structures and that certain perspectives are discussed while others are ignored is necessary in responding effectively to the Zika crisis and deconstructing peoples' understanding of the epidemic (Van Dijk et al. 2013). As a developing disease in the United States with an evolving discourse, Zika offers a unique window on how the language and framing of a public health epidemic is created, circulated and affects policy. Understanding Zika discourse in media can elucidate patterns and relationships of power in government policy and also reflects trends across discourses of past public health crises. Identifying themes and commonalities between the discourse and policy of Zika and past public health crises could help to elucidate why some people are differentially affected by emerging diseases and inform future public health responses. Even though language and discourse play an important role in the context of public health and policy, there has been little research on how Zika has been represented in media (Wallis and Nerlich 2005). While identifying and tracking all Zika discourse is unfeasible, individual efforts such as this study can inform the specific and unknown link of how media is framing and shaping the discourse of Zika and how this emerges in policy.

The rising threat of Zika in the United States and the importance of media and discourse in shaping public opinion and government policy raises the central question of this paper: How is Zika discourse represented in American Media? More specifically:

1. What discursive frames are present in American media?
2. How do the language and framing of these themes reflect power relations and inequity?

3. What implications does this have for public health policy and future public health crises?

## BACKGROUND

Here I briefly describe Zika's predominant mosquito vector and the epidemiology of the disease. I also provide a brief background to a few of the key policy responses, federal funding bills and government reports that address Zika in the United States.

### Mosquito Vector and Zika Epidemiology

The *Aedes aegypti* mosquito, the predominant vector in transmitting the Zika virus to humans, must be considered to best reduce the transmission of Zika. Understanding the biological and environmental factors that contribute to mosquito life cycle processes and habitat are critical in creating plans for vector abatement and deciding upon the use of pesticides or GMO mosquitoes as a form of vector eradication. The transmission of Zika is dependent on the successful survival of *Aedes aegypti*, and therefore the environmental and climactic conditions the mosquito needs to complete its lifecycle. *Aedes aegypti*, which are also responsible for the transmission of Chikungunya, Yellow Fever, West Nile Virus and Dengue Fever, live in tropical, subtropical and temperate climates (Fauci and Morens 2016). The mosquitoes have travelled through global shipping and trade from their African and Asian origins to equatorial nations around the world (Fauci and Morens 2016). They have co-evolved with humans for the past 5000 years, and prefer urban habitats with dense human populations (Fauci and Morens 2016). They have no particular feeding time and can live inside and outside of buildings, making them particularly difficult to target with pesticides. *Aedes aegypti* larvae live in bodies of standing water that can be as small as a bottle cap, and are often found in trash that has collected water. Additionally, they are "sip-feeders"; females feed multiple times in short timespans before they reproduce – making them excellent transmitters of disease ("This Mosquito Likes Us Too Much For Our Own Good" n.d.). *Aedes albopictus* is another mosquito species that can transmit Zika virus, but is considered less threatening because it does not feed primarily on humans or live exclusively in urban areas. Both *Aedes aegypti* and *Aedes albopictus* exist in the southern United States, spanning the Gulf Coast and as far North as New York and California ("Zika Virus"

2014). Some climate change projections predict the geographic habitat of these mosquitoes to increase across the United States, as increasing temperatures and precipitation create more viable habitats. However other projections predict little to no change, or a reduction in mosquito habitat.

The Zika virus is a flavivirus related to others such as Yellow Fever, Dengue and West Nile that have a propensity for causing encephalitis in humans. The Zika virus was discovered in Rhesus monkeys by a scientific team in the Zika Forest of Uganda and was later isolated in humans in 1952 in both Uganda and Tanzania (Ioos et al. 2014). The first widespread outbreaks of Zika occurred in 2007, causing epidemics in Gabon and Yap Island in the Federated States of Micronesia. The most recent outbreak that has resulted in Zika's spread through South American, Latin America, and into the United States began in the Bahia region of Brazil in 2015. Only one in five people infected experience symptoms, which commonly include "maculopapular rash, fever, myalgias/arthralgia, and conjunctivitis (Campos et al. 2015)." However, less common but more severe symptoms have been associated with the disease including microcephaly, Guillain-Barre syndrome and arthrogryposis (Sikka et al. 2016, Linden et al. 2016). As of May 3, 2017, 5,274 cases of Zika had been reported in the United States, with 4,973 from travellers being infected in endemic areas, 224 cases from local mosquito-borne transmission and 77 from other methods including sexual transmission within the United States ("Zika Case Counts in U.S." 2014). Due to seasonal tendencies of the *Aedes aegypti* mosquito to grow in warmer, wetter times of the year, Zika poses a reoccurring and seasonal threat in endemic areas such as parts of Texas and Florida.

### **Current State of Policy and Government Action**

In response to the increasing threat of Zika, state and federal governments have created mechanisms that address vector abatement and management and disease transmission prevention. Many state protocols outline public health measures preceding an outbreak and, in the case of an outbreak, also focus on healthcare availability and vector control practices. Abatement and management campaigns were successful at reducing *Aedes aegypti* populations in the early 1900s in response to outbreaks of Yellow and Dengue Fever. These efforts were primarily executed by local Boy Scouts, who were tasked with overturning yard items that could

hold water (“To Fight Mosquitoes, Time To Send In The Boy Scouts : Shots - Health News : NPR” n.d.). Federal and state Zika response plans are inherently general, as they address and manage large populations and geographies. They do not directly recognize difference in geography, nor cultural or socioeconomic differences in the populations considered in their plans. They sometimes recognize that different communities may need different response plans, but fail to delve into the reasons why.

There have been a variety of federal, state and organizational policy and health responses including two Congressional bills and the Center for Disease Control’s predominant response plan. There have been two main bills that have passed congress that regard funding a Zika response: the *H.R.5243 - 114th Congress (2015-2016): Zika Response Appropriations Act, 2016* and *H.R.5325 - 114th Congress (2015-2016): Continuing Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations Act, 2017, and Zika Response and Preparedness Act* (Rogers 2016, Graves 2016). These two bills approved \$1.1 billion for funding the United States Zika response and delineate the government departments that will be allocated funds. The federal response from the Center of Disease Control and Prevention (CDC) focuses on supporting state mechanisms that are specific to the local environment and geography. The CDC’s plan outlines a CDC Emergency Response Team (CERT) that can be mobilized to address Zika outbreaks by aiding in vector control, laboratory availability and state management and communication (“Draft Interim Zika Response Plan - zika-draft-interim-conus-plan.pdf” n.d.). The CDC’s plan aims to create a chain of command and organize which departments are responsible for certain objectives and who they are responsible too at varying stages of a possible Zika epidemic. There are also a variety of State policies and reports that interact with the public health departments of individual cities and towns. The main federal actors in the United States response to Zika are the Center for Disease Control and Department of Health and Human Services. When there is an outbreak or recorded Zika case in the United States, the CDC works closely with local public health departments to address and contain the disease and educate the public (Hernandez 2017).

## METHODS

### Data collection

I collected three types of data for this project: textual data in the form of newspaper articles, government policy and texts, and data from interviews with public health professionals contributing to the Zika discourse.

#### *Newspapers*

I collected newspaper texts predominantly from the *New York Times*, the *Miami Herald*, and the *Dallas Morning News* (Appendix A). I chose to analyze these newspapers because of their high circulation and popularity and because of their basis in areas affected by Zika. I collected articles from these newspaper's online websites by searching "Zika" by "most relevant articles" and selecting the first 15-20 articles that came up for each newspaper. A few additional articles were analyzed from the *National Public Radio* and the *Atlantic*. Here I give a brief background to these papers an explanation for selecting each.

**New York Times.** The *New York Times* (*NYT*) is considered the "national newspaper of record", meaning that it has a broad circulation and that its journalism is known to be professional and authoritative in the industry (Dunlap 2017). The *NYT* has the second largest circulation in the United States. The *NYT* has historically covered politically controversial news topics and proclaims its commitment to "diversity" and "social responsibility", specifically detailing its action in "environmental stewardship" and supporting employee networks of women, varying ethnicities, and LGBT and allies ("Who We Are | The New York Times Company" n.d.). The *NYT* is considered to have factually accurate reporting and a "left-center" or moderate liberal bias that takes the form of using "loaded words" that favor liberal perspectives ("New York Times" 2016). The *NYT* was chosen for analysis because it is a "newspaper of public record" and because of its popularity and large circulation across the United States.

**Miami Herald.** The *Miami Herald (MH)* serves Miami-Dade, Broward County and Monroe County as the second largest newspaper in Southern Florida. The *MH* is in the top fifty highest-circulated newspapers in the United States and also circulates through parts of the Caribbean and Latin America (“About Us | MiamiHerald.com & Miami Herald” n.d.). The *MH* is considered to be “left-center”, using loaded words to favor liberal tendencies, and to have a high consistency in factual reporting (“Miami Herald” 2016). The *MH* was chosen for this study because of its large circulation within Florida and its basis in Miami, the frontlines of addressing Zika in the United States. It offers a much more local perspective on Zika, as it is based in a city undergoing endemic transmission of the Zika Virus.

**Dallas Morning News.** The *Dallas Morning News (DMN)* has one of the largest circulations in the United States and serves the greater Dallas Fort-Worth area (“Top\_Media\_2013\_January2013\_Final.pdf” n.d.). The *DMN* is historically known as a more conservative newspaper, and has consistently supported Republican Presidential candidates since Franklin Delano Roosevelt until just last year, when it supported Hillary Clinton in the 2016 election. The *DMN* is considered to have a “right center” bias that uses loaded words to favor conservative leanings and is considered to have highly factual reporting (“Dallas Morning News” 2016). The *DMN* was selected for analysis because of its large circulation in Texas, a state that is currently experiencing the Zika virus as an endemic disease. It was also selected because of its more conservative tendencies in order to provide a comparison to the other two more liberal newspapers analyzed.

### *Interviews*

I conducted open-ended interviews with people from city public health departments of health organizations who are contributing to the Zika discourse to collect interview data. I interviewed Tammy Mogford, Director of The Zika Foundation, Ryan Clausnitzer, District Manager of the Alameda County Mosquito Abatement District, Sarah Babcock of the New Orleans Public Health Department, and Lorenzo Hernandez of the Brownsville Public Health Department. I asked questions with some variation depending on the association and knowledge of the person being interviewed (Appendix B).



## Government

I collected textual data regarding government policy from the *United States Government Zika Virus Disease Contingency Response Plan* written by the U.S. Department of Health and Human Services, and the text of the Zika funding bill, *H.R.5325 - Continuing Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations Act, 2017, and Zika Response and Preparedness Act*, and the Center for Disease Control's (CDC) Interim Response Plan for Zika.

## Data Analysis

While collecting the newspaper texts, I categorized them into two matrices; one based on predominant themes in content, and the other based on the geographies discussed within each piece. These thematic categories were influenced by the discursive themes delineated in a discourse analysis of HIV/Aides and the common characteristics that arose in the collected texts (Seidel 1993). I identified five predominant and relevant frames of Zika discourse in the *New York Times*, *Miami Herald*, and *Dallas Morning News*. I also categorized the articles based on predominant geographies discussed, including Florida, Texas, national (United States) and international. Articles were placed in at one or more categories given their content.

After categorizing the newspaper articles, I chose six from each content category (one or two from each paper) and did a semi in-depth discourse analysis, considering each article in terms of five levels of textual analysis: production, text form and content, circulation, discursive effects and context (Huckin 2002). This analysis was performed to compare how varying forms and sources of discourse define the content of these frames differently. This was achieved by considering aspects of text such as genre, section, frame, modality, content, actors, agency, presuppositions, and omissions. I then determined patterns across these textual characteristics within each category to characterize and define each category as a discursive frame. In addition to these in-depth and methodical analyses, all articles were read, briefly analyzed, and considered in terms of how they supported and constructed these different frames. I used categorization by place to analyze the relative prominence of each discursive frame regarding specific geographies.

I analyzed interview responses more broadly, and used to supplement the discursive frames found in the articles. The interview responses were used to support the frames found in the newspaper articles, and offered a more involved and technical perspective than that of the media. I then performed a brief and holistic analysis of the policy texts, searching for similar discursive frames, language used and textual characteristics. The trends and patterns in government and policy texts were then compared to the frames found in the newspaper articles and interview responses. After these analyses, the newspaper, policy and interview data were considered in relation to each other to identify patterns across the different mediums and determine how these discursive frames may interact. Throughout the process of analysis, a Foucaultian approach, similar to Seidel's discourse analysis of HIV/Aides, was taken with "concern [being on] how discourse functions and how power is exercised through discourse (Seidel 1993)." As I identified the characteristics and circulation of these discursive frames, I also recognized patterns in how certain language, phrases and framing could represent power relations between different individuals, communities, and governments based on race, socio-economics, gender and nationality.

## **RESULTS AND DISCUSSION**

### **Common Content**

I determined the five dominant frames in the discussion of Zika in American media to be (1) medical moment, (2) women and gender, (3) development, (4) economy and (5) environment. The frames of the medical moment and economy dominate Zika discourse, focusing on Zika as an urgent health crisis or as a crisis for affected economies. The authoritative and commanding voices that characterize these frames obscure less dominant voices that constitute the frames of environment, women and gender, and development. The frames of environment, women and gender, and development explore how power is associated with language and framing to advantage certain people and ideas over others, and represents less dominant voices in discourse. All five frames interact together to construct how people understand and respond to Zika. The following sections detail and critique each frame.

*Medical Moment*

The primary theme in Zika discourse is the representation of the epidemic as a public health emergency or crisis. This medical discourse can be considered through the lens of the “medical moment”, the hegemonic discourse for epidemic diseases, which is the most dominant discourse in frequency and authority (Seidel 1993). This hegemonic discourse overshadows other narratives and perspectives because it is considered the most urgent and relevant. It presents information on a disease in the short term and denotes real time progression of an epidemic. The “medical moment” is characterized by a focus on information, factors, causes and responses that are critical and apparent to addressing the epidemic in a short-term perspective. This discourse is evident in American media’s focus on medical symptoms and numerical counts of infection, and its reliance on public health and government officials as authorities in the Zika discourse.

While this focus on the medical moment is necessary to inform the public and express the gravity and urgency of a disease amidst an epidemic, it can obscure other narratives that may be contributing to the transmission of or be useful in understanding how to stop the disease. Newspaper articles presented the medical moment frame more often than any other discourse. They often begin with a brief description of Zika and mosquito transmission, the most relevant count of infection, the count of infection in pregnant women and the geographies affected, followed by a description of the innately scary and grotesque symptoms of microcephaly (Ungar 1998). This frame and presentation of this information through numbers, medical terminology, and the scientific method hides the subtleties of other themes and power relations that exist in the discourse (Seidel 1993). Often these other themes have much longer or more historical perspectives that are evident across a number of public health crises, and are more tied to the structural, societal issues of disease than the immediate threat of being bitten by a mosquito (Seidel 1993). While the medical moment answers the immediate questions of whom, where, and when, it overwhelms the discourses that enlighten the answers to the equally important questions of why and how.

The medical moment discourse for Zika is characterized by a focus on relative certainties, drawing on authorities such as health and government organizations and officials who inform the public through facts about the disease, whether through describing symptoms, delineating geographical boundaries, or recommending preventive measures. Periods of fear and reassurance

characterize the medical moment, in which discourse balances between creating panic through uncertainties and reassuring through certainties that readership cannot be harmed by the disease (Ungar 1998). A dominant characteristic of this discourse is the discussion of babies, fetuses, and the disturbing symptoms of Zika and microcephaly. It is routinely mentioned that Zika “attacks the fetuses of infected women, killing some and leaving others with severe brain damage,” and that “infants that appear normal now [but] may suffer from intellectual deficits or mental illness later in their lives (McNeil 2016b).” Microcephaly is most commonly mentioned, and is considered “the most severe deformity...a tiny head with a severely underdeveloped brain (McNeil 2016a).” The majority of articles include pictures of women in Brazil or South American holding their microcephalic children. Some articles include photos that also depict medical equipment or x-rays of microcephaly. To reassure American readership, articles also often frame the discussion to show that the United States government has the situation under control, and early on in the epidemic stress that it would be very unlikely for Zika to be transmitted within the United States (Ungar 1998).

The medical moment discourse also calls on dominant voices of authority, such as public health and government officials and related academics to offer insight or to support the logic behind certain public health measures taken (Wallis and Nerlich 2005). Many articles quote officials from the WHO, CDC, Harvard Medical School, Children’s National Health System and other academic institutions (McNeil 2016a). The *MH* quotes local public health officials and the Florida governor (Chang 2016b). Expert authorities are used to support this discourse, but there are very few narratives from individuals experiencing Zika or the risk of Zika. Often when these anecdotes are included, they are used to dramatize or support a greater point of the article, while very little agency is given to non-expert individuals. This omission of individual experience hides underlying discourses or factors associated with the disease that may be more societally based. For example, another common photo used repeatedly in articles is a close-up image of a mosquito (Rice 2016). The *MH* even includes a short video clip in a few of their articles titled “Who’s to blame?”, the answer being mosquitoes (Chang 2016a). This focus on transmission cycle and the literal placing of blame on mosquitoes omits and excuses other factors such as the environment, socio-economics, or lifestyle that may contribute to the spread of Zika.

The medical moment discourse also works to define Zika by delineating geographic areas of disease and non-disease and identifying “risk behaviors”. Particularly in the *MH*’s articles that

report disease counts, maps of “zones of transmission” are included that show a map of Miami with dashed red lines boxing off certain areas (Flechas and Chang 2016). The *MH* also has an interactive map called the “Daily Florida Zika Virus Tracker” which shows expanding circles that represent increasing counts of infection in different Florida counties. Other common maps included in articles show spread of mosquitoes that can carry Zika in the United States, and proposed areas that could become endemic with Zika. This creation of defined areas of disease and non-disease give the medical discourse authority and certainty, even though these boundaries are flexible and changing with the movement of people and mosquitoes. This division has problematic effects. Identifying certain areas as Zika zones can associate certain communities or populations with the disease and harm local economies (Herrera 2016). These areas of disease are also created through travel bans or advisory warnings that define areas as safe or unsafe. Identifying “risk behaviors” places a value judgment on the people who participate in these activities, and overlooks underlying cultural or personal factors that may contribute to people engaging in this behavior (Stuntzner-Gibson 1991). Risk behaviors identified include unprotected sex or traveling to an area known to have Zika or are also implied as not taking part in preventive measures such as covering bare skin or using bug repellent. Drawing boundaries of safe and unsafe areas or identifying risk behaviors can be inadvertently harmful to public health by leading people to assume that if they don’t enter these areas or don’t partake in these behaviors they are not at risk of Zika.

The limited certainties of disease transmission, symptoms and location of this medical discourse are all modes of explaining the greater uncertainties of Zika and quelling fear surrounding the disease. Very little is still known about how it functions, the longevity of its repercussions and where it may spread in the future. These larger uncertainties sometimes provoke a fearful and distrusting response, evident in other news articles and in the discourse of past diseases (Ungar 1998). For example, the medical discourse reports on recent vaccine and microcephaly research giving examples of how many cases of microcephaly are tied to Zika, or where microcephaly didn’t develop in babies until they reached one year of age (Belluck 2016). These studies report known certainties, yet lead people to speculate on the possibilities of unknown and uncontrollable risks. People’s uncertainties around Zika are voiced through the media’s expression of distrust or uncertainty with government measures being taken, or criticism of these government actions. Examples are articles that claim the “Zika response has failed

millions” or question the health effects of spraying pesticide for mosquito abatement (Viglucchi 2016, McNeil Jr. 2017). The *MH* sued (and won) the city to find out which mosquito traps tested positive for Zika (Chang 2016c). Further distrust is evident in other articles describing the public backlash against pesticide spraying in Florida and Puerto Rico, where populations disagreed or did not trust their governments and public health departments to act within their best interests (Farmer 2016).

The medical moment discourse inspires fear with frightening imagery that provokes panicked responses from the public, but also works to reassure the public with science and control. The larger media and these newspapers serve as a voice for both the certainties of reassurance and uncertainties of fear in the Zika discourse. It is beneficial to understand both the discourses as well as how they are being presented in various media. While sometimes criticized or questioned, the medical discourse still dominates most news articles because it is the discourse readership assumes is mostly based on scientific facts gleaned from credible authorities. At the same time medical discourse attempts to present the situation of Zika and provide solutions in the short term in understandable and urgent language. While it is the most evident in media articles, the medical moment frame is also tied to the economy frame and overshadows other frames and discourses that are important to uncover within media because they also shape the public’s understanding of and reaction to Zika.

### *Economy*

The “economy” frame of Zika is characterized by discussions of money and the controversial tensions between balancing the best interests of public health and economic welfare. This balance comprises discourses on tourism that prioritize economic health and their consequent critiques. This balance between economic health and public health is also evident in congressional funding debates, and within the push for biotech companies to develop a Zika vaccine.

The *NYT* and *MH* focus on economic voices in their discussions of Zika’s effects on tourism and the hotel industry in Florida, the Caribbean, and Mexico (Vora 2016). Many articles are placed in travel or business sections of newspapers and note the “immediate decline in visitation” or the “weak travel demand” that has been correlated with Zika in these areas

(Herrera 2016). People interviewed within these articles refer to the “Zika effect” on local businesses that reduces customers and therefore harms the local economy. The *NYT* equates the economic impact of Zika with that of the Miami nightclub shooting saying, “Despite Shootings and Zika, Florida Tourism Remains Strong,” and later blames Zika for the worst decline in Miami’s economy since the Great Recession (Vora 2017). This focus on the hotel industry and tourism gives voice to larger corporations and companies and normalizes broader economic health as being the best for all people. However, focusing on spokespeople from large companies or businesspeople from trendy neighborhoods does not create space for less affluent individuals and how Zika is affecting them. Prioritizing the tourism industry and business has caused tensions across the greater Miami community.

The *MH* has criticized the Florida state government and public health services that have been monitoring and reporting on the spread of Zika and the governor of Florida’s efforts to lift travel advisories and announce Zika free-zones (Flechas and Chang 2016). While the City of Miami’s public health response of travel bans has been criticized by businesses for harming the economy, with a council representative of Wynwood saying that the travel bans and advisories “suffocate a neighborhood”, the *MH* criticizes the government’s hastiness in removing travel bans (Chang 2016a). The *MH* argues that the City is prioritizing the economy over public health in Miami-Dade County. The *MH* focuses particularly on how public health may be harmed at the expense of the local economy, accusing the local government of underreporting infection rates and the locations of Zika-carrying mosquitoes to spare the tourism industry (Chang 2016c). The *MH* eventually sued the city to release the known locations of infected mosquitoes. This is particularly relevant after realizing that the declaration of areas free of Zika by the WHO or Miami government has immediate economic effects. The Wynwood area of Miami experienced a resurgence in tourism when the travel ban was lifted on the area. Likewise, tourism companies noted increased bookings to hotels and resorts in the Caribbean and Mexico when the WHO downgraded the Zika epidemic to a non-emergency (Alvarez 2016, Vora 2016). These tensions are variably experienced and expressed by many Miami residents. Some tourists were unconcerned because they didn’t plan on becoming pregnant any time soon (Harris 2016a). Some business owners are also unconcerned, stating how they didn’t see a decrease in local customers and had not heard from any that they were staying away because of Zika (Chang 2016b). Another business owner in South Beach also explained how the city came to remove her

restaurant's plants and brought fans to keep the mosquitoes away(Chang 2016b). However this brings up questions of what areas are deemed important enough or economically valuable enough by the city to receive these services.

Biotech companies' profit motivation is also a factor in the economy frame that has shaped the public's understanding of and the fight against Zika. The motives of companies producing genetically modified mosquitoes, creating pesticides or larvicides, and attempting to develop vaccines are in part motivated by profit. This profit motivation does not always result in what's best for public health, even though public health is greatly reliant on the efforts and decisions of these companies. The involvement of biotech companies in the fight against Zika is a part of the economic discourse of Zika because many articles make clear that the primary motives of these companies centered on money (Thomas 2016). This profit motive can also be seen to influence companies like Oxitec, which produces genetically modified mosquitoes as a form of abatement. In articles discussing a Zika vaccine, the Zika epidemic is considered an "opportunity" in comparison to the Ebola epidemic which was a "missed opportunity" (Thomas 2016). The search for a vaccine is described as "a race" between companies who have a newfound motivation because the Zika epidemic has reached countries that can afford a vaccine. The framing in these articles hold this economic incentive above the reward of helping millions of people. Likewise, this same motivation can be seen in Oxitec, as they push for clinical tests of their mosquitoes. Oxitec's trials in the Florida Keys were embroiled in protests as local residents resisted even though it was finally approved last November (Allen 2016). While this economic motive may incentivize innovation and eventually result in a viable vaccine, it undermines companies' focus on public health. Their economic incentive may cause them to overlook the needs or wants of communities they are working with or take advantage of vulnerable communities or relaxed regulations to achieve their product. Similarly, these companies are not focused on which populations are most adversely impacted and greatly need a vaccine, but on those that can pay for it - in other words, these vaccines are not created or meant to be distributed in developing nations because they have limited capital (Adams and Nutt 2016). This economic frame complicates the development frame (described below) by phrasing North-South difference in terms of money. The intent for vaccines to be distributed only in the developed world also goes against global public health motives to end an epidemic where it begins, like expressed in the Emerging Diseases Worldview later in this discussion. This could allow for the Zika virus to



evolve in areas that don't have access to vaccines and threaten vaccinated populations in another outbreak.

Another theme within the economy frame is the issue of Zika funding, which is viewed differently between newspapers and the geographies they represent, but mutually critiqued by the *NYT*, *MH*, and *DMN*. The opposing economic opinions of the Democratic and Republican parties greatly influenced the discussion of Zika in Congress. While Senators from opposing parties in Florida, Marco Rubio and Bill Nelson, came together to demand more funding from money from Congress for their state, partisan politics slowed passage of the Zika funding bill (Rosen and Bureau 2016). While bipartisan politics is not always directly based in economic arguments, it is certainly influenced by money (McNeil Jr. 2017). The *NYT*, *MH* and *DMN* each had a different perspective when discussing the Zika funding issue in Congress. The *NYT* focused primarily on partisan issues as the cause for the delay in funding, the *MH* focused on the valiant efforts of their own Senators in pushing for funding, and the *DMN* reported on the funding debacle from the perspective of one of their Republican senators (Lovegrove 2016). These sentiments align with the political biases of each paper or the local pressures of the disease that the State was experiencing. The *NYT* discussed the added pieces to the Zika funding bill that were unamenable to each party, such as the Republican's attempts at reducing funding for Planned Parenthood or allowing for the confederate flag to be hung in federal cemeteries. The *NYT* framed the delay of the Zika funding bill as a result of the Republican Party's anti-abortion stance and ultimately their ties to religion (McNeil Jr. 2017). The *MH* criticized Congress for their lack of action, and reported on how the White House's request for \$1.1 billion was not enough money to address the crisis (Rosen 2016). The *DMN* echoed the opinion of their local senator that the Zika crisis could be addressed in an effective and "fiscally responsible" way, criticizing the government for not using already allotted funds, and demanding an explanation of how the funds were to be spent (Lovegrove 2016). However, the delay of federal funding and focus on being "fiscally responsible" undermines the gravity of Zika and its effects. The inability of states to prepare and take preventive measures to address the disease only increases the cost of paying for microcephalic children and their families in the future. The *NYT* reported on the life of a genetically microcephalic boy in New York to detail the cost and care necessary to support a microcephalic human, and reported the CDC's estimate of \$10 million as the cost of support over a lifetime (Santora 2016). Yet, this doesn't account for the economic impact on a family of

varying levels of income that have to care and support for a microcephalic child. Once again, funding discussions attempt to balance what Congressional voices consider economically feasible and what is best for public health.

While economics is a measure of health - having money increases your chances of accessing health care, not living in at-risk places, and giving you choices to influence your own health - those without money are often disadvantaged by the focus on economic arguments in addressing public health crises. While the local economy or fiscal budget has long-term effects on individuals, the success of a Miami hotel or the delayed discussion in the particulars of a Zika funding bill do not directly and immediately affect the wellbeing of individuals who are most at risk for Zika. This balancing act of economy and health is not unique to Zika, and points to more important questions of what it means to maintain public health in a free market - or to be someone without capital in a capitalist society.

### *Environment*

The environment is another common theme in Zika discourse. This theme is inextricably tied to discussions of Zika, because weather, temperature, vegetation, and other environmental factors are influential in vector growth and disease transmission. Reference to the environment or surrounding geography is made in almost every article to give context to the Zika virus and the specific locale it is affecting. Differences in environment between cities, states and nations require different approaches and responses to the Zika virus. The surrounding environment is often the main factor governments and experts consider in deciding if an area or city should be concerned with the possibility of Zika becoming endemic. Discussions of the environment commonly arise in reference to habitat for vector and virus growth, human encroachment on wildlife areas, the spread of pandemic diseases, climate change, and the spraying of pesticides or other preventative measures.

The “environment” referenced in articles takes on many different forms and characteristics, but serves the common purpose of providing assurance or certainty in understanding the spread of disease and what preventative measures can be taken. Zika virus is considered to be less of a threat under certain environmental conditions. For example in Florida “winter...brings the end of the rainy season and slightly lower temperatures (Alvarez 2016). ”

Zika is more of a threat during “the summer...and early rains” or due to Florida’s “tropical climate (Alvarez 2016).” The medical director of the Rio Olympics declared “‘Athletes are not at risk’...because for us it is wintertime,” attributing the low risk of transmission and non-necessity of a travel ban or other precautionary measure to the weather (Carter 2016). The environment is also represented in Zika discourse through the use of map displays that relate possible disease and mosquito distribution in the United States and across the world, and the possible trajectories of travel transmission cases (Peçanha and Wallace 2016). Models that produce these projections rely on environmental parameters such as precipitation and temperature that are scientifically collected, giving an air of authority to these representations in media. Such maps serve as evidence for newspaper articles and city governments alike of who and what areas are at risk for Zika even though they are often based on models that make assumptions about a changing environment.

The environment also plays a major role in the construction of Zika as a “tropical disease”. The Zika forest in Uganda where the virus originated is introduced as a place found by “slashing through tropical brush,” and to be a “swampy area” with a “cool, wet climate” (Kron 2016). Calling the Zika Forest a “petri dish for virologists” not only plays into the colonial idea that the developing world is meant for the science of the developed world, but also enforces that tropical environments are teeming with diseases like the Zika Virus and that tropical origin is a defining characteristic of the disease (Kron 2016). Because certain environmental characteristics and geographies are identified as being more susceptible to Zika transmission and vector growth, these characteristics contribute to determination of preventative measures by public health organizations or governments. Environmental factors impact government decisions of when and what type of abatement should be used and what prevention measures to advise people. “‘People in the area need to take precautions...’” said a Miami sanitation worker because of the “summer rain and heat” (Carter 2016).

The environmental frame also prioritizes human health over environmental health and sometimes implicitly blames the surrounding environment for the presence of Zika. Associating Zika’s presence with certain climatic factors, or “blaming” mosquitoes for the transmission of Zika, frames Zika as “natural” and ignore societal or economic factors that could be influencing transmission (Chang 2016a). Focusing on the “natural” processes of the environment also disregards the actions of humans moving into environments that could put their health at risk.

While this may be less evident in developed nations like the United States where most land has already been converted or made off-limits to human use, the movement of expanding populations in developing countries into wild areas does increase risk of new disease transmission (Daszak et al. 2000). The Zika forest in Uganda where the virus was first discovered was “cropped in half in the past fifteen years” and is now surrounded by a “soccer field, highway and real estate developments (Kron 2016).” Although the mosquitoes in the area “tended to remain in forested areas...as those areas get developed, scientists worry the danger to humans can only grow” as the forest “[suffers] human encroachment (Kron 2016).” As humans push further into wild areas due to rising populations and economic incentive, such as grazing cattle in the Brazilian Amazon, people risk exposure to diseases that could cross over from similar hosts. Additionally constructing Zika as a tropical disease of the developing world ignores the reality that the *Aedes aegypti* mosquito commonly lives in habitats created by humans in the United States. Abandoned pools, flowerpots, or empty buckets serve as habitat in an urban environment in developed or developing countries (Unlu et al. 2013).

Another theme characterizing the environmental discourse is the potential effects of climate change on the spread and transmission of Zika and how the “complexity is enormous” surrounding the issue (Gillis 2016). While some studies report that climate change will increase vector habitat, others suggest that vector habitat will decrease or just that some change will occur (Kearney et al. 2009). Because “epidemics always involve interactions among genes, ecology, climate and human behavior” understanding how different factors contribute to disease presents “profound difficulties for scientists” (Gillis 2016). The former director of the CDC, Thomas Frieden, claimed that “...the rapid spread of pathogens such as Zika represents ‘the new normal’ in an age of global travel and trade, booming cities and climate change (Chang 2016d).” By accepting climate change as a contributor to pandemic disease, the Director bolsters climate change as fact and forces people to recognize it as something that could have very real effects on their lives. Particularly in the United States, where climate change is still a hotly contested issue, public health will suffer if officials and residents do not recognize and address the impacts of a changing climate on Zika transmission. Even the brief statement that “Zika could soon enjoy a greater range, thanks to climate change” affirms that climate change is fact, but also adds to the fear surrounding both Zika and a changing environment (Mercer 2016). Other articles quoted researchers who considered how climate change affects the biology of mosquito life cycles,

summarizing that with warming temperatures, “[mosquitoes] bite more, breed more, and spread more disease” (Mercer 2016). The *NYT* and the *Atlantic* recognize and discuss the possible effects of climate change on Zika, but the *DMN* had no articles mentioning climate change and the *MH* only referenced it within a quote by the Director of the CDC (Chang 2016d). This acceptance and recognition of climate change by government and citizens in certain areas will allow for a better understanding and response to Zika. Depending on different valuing of climate change and the environment, the effects of and responses to Zika could be different across different communities and geographies, making some more vulnerable to Zika than others.

The environmental discourse is also characterized by discussions of controversial mosquito abatement practices, such as the spraying of Naled or use of GMO mosquitoes. While engineering GMO mosquitoes is still in the testing process, Naled has been widely used as a chemical pesticide in Miami and other areas of Florida to prevent mosquito growth (Hoang et al. 2011). Both approaches have been protested against because of unknown and possibly adverse impacts on humans and the environment, although claims for protecting the environment seem to bolster greater fears for human health (Farmer 2016). While the *NYT* recognizes the minimal possibility of adverse human health effects due to spraying, the *MH* takes a much more critical perspective in an article titled “Is Insecticide Used to Fight Zika Harmful to Humans and Wildlife?” (Viglucchi 2016). The *MH* introduces Naled as a “controversial pesticide” and reports that it’s “toxic not just to the noxious flying parasites, but also to beneficial insects like honey bees, as well as birds, some fish — and people (Viglucchi 2016).” The article continues to report how Naled is banned in the European Union, is associated with harmful impacts on fetal brain development, and is likened to the “potency of a chemical weapon.” The article calls on environmental harms to emphasize these health claims by explaining how Naled has been linked to a decline in local butterfly populations and is harmful to aquatic invertebrates and trout. The article increasingly questions the use of Naled by including an anecdote of protests in Puerto Rico that eventually pushed the government to stop spraying. The *MH* ends the piece by saying the government should be “extremely wary about deploying Naled” and should “warn people about the risks involved (Viglucchi 2016).” The article jointly calls on the health of the environment and people to criticize Miami city’s use of Naled.

Other environmental fears arise from the use of GMO mosquitoes as a form of abatement, drawing both from fears of Zika and of GMOs (Somerville 2000). These fears

resulted in the biotech company Oxitec being “embroiled in a long fight with residents of a tiny suburb of Key West called Key Haven — the designated site for the mosquitoes’ release (Alvarez 2016).” While the Food and Drug Administration had approved the mosquitoes release, residents feared the possibility of that the GMO mosquitoes might create a “super mosquito” that could better spread the disease or cause damage to the local ecosystem (Pollack 2016). The *DMN* discusses GMO mosquitoes in their “Debunked” section of the paper in which they dispel conspiracy theories in a very casual tone. A particular article is written in the first person and uses phrases like “a guy named Rob” describing mosquito eggs as “shiny grains of rice” (Yasmin 2016a). The *DMN* recognizes the uncertainty of future harm GMO mosquitoes could cause, but clarifies that they are not the mosquitoes spreading Zika. This clarification gives insight into concerns broadly being discussed by audiences of the *DMN*, and how these are real enough for the newspaper to address. These concerns connect issues of human health to environmental health and recognize that each contributes to the other. However this also shows the balancing act between immediate public health needs and long term environmental and human health. Long-term effects are sometimes overlooked due to the seemingly dire need for an immediate public health solution. Yet the fact that other developed countries do not use these chemicals or organisms implies that the United States may not be taking the appropriate steps to prepare for a disease outbreak, but relies too heavily on fast, expedient solutions. The environmental discourse counters the medical moment discourse because it poses long-term concerns in the face of government trying to find immediate solutions.

### *Women and Gender*

Women are mentioned in almost every media story on Zika. Issues of women’s rights, women’s healthcare, and women’s relationship to Zika constitute a dominant discourse across all news sources. This focus is necessary because pregnant women face a great risk of birthing microcephalic babies if they are infected with Zika. When recounting the latest number of infections, every newspaper pointed out specifically how many of them were women and how many of them were pregnant women. Pregnant women were also the main focus outreach group for the public health departments and organizations I interviewed (Mogford 2017, Clausnitzer 2017, Hernandez 2017, Babcock 2017). However, while the focus on women as possible

infections is necessary and important, particularly in the early stages of Zika spreading through the United States, this emphasis can also be harmful and problematic. It is critical to understand how this relationship between Zika is being constructed, and what knowledge and narratives are characterizing this discourse at the expense of others.

The focus on pregnant women is necessary and important, yet newspaper articles don't often go beyond the immediate effects and negative sentiment of having a microcephalic baby. Newspaper articles emphasize the connection between mothers and microcephaly by including photos of solemn mothers holding their microcephalic babies and using language such as the "terrible consequences" of Zika and describing lack of government and organizational aide as "hideous" and a "travesty" (McNeil Jr. 2017). The *NYT* hints that "families are already suffering" and that medical care for these microcephalic babies will cost "hundreds of million of dollars," but doesn't draw the connection that this burden will fall largely on the mothers who have birthed them (McNeil Jr. 2017). Women who give birth to these children are at risk of becoming a "lost generation" in that they can no longer participate economically and socially within their communities because they have to care for a disabled child (Preston-Whyte 1994). Because the effects of microcephaly are so severe and many women are not in the economic position nor have access to state aid for helping with medical disability, Zika will greatly impact the wellbeing of the women who have to care for the disabled. Zika is an additional stressor on existing oppressive intersectionalities such as socio-economics, gender and race that put all women, but specifically women of color and poor women at more risk for being greatly affected by Zika infection (Bowleg 2012).

However, this focus on women as the most vulnerable community has manifested in constructing women as passive victims of Zika. The fight against Zika, whether through finding a vaccine or encouraging economic funding, is often framed in the patriarchal trope of protecting women and unborn fetuses (Rich 1995). This is evident in always including how many women and how many pregnant women have been infected within a given geography, or directly identifying women as the "population of concern" (Hernandez 2017). In most articles, "women" are portrayed as those that need to be saved by government and global health organizations. Even in the articles that criticize the lack of action from these governments and organizations, women are portrayed as suffering because of these organizations' "failures", which while critical, affirms the women as objects needing to be protected (Rich 1995). Additionally, most of these

organizations are represented by male spokespeople, such as Thomas Frieden, the former director of the CDC, or the articles make claims of authority by quoting experts who are predominantly male academics (Chang 2016d). In many articles, women are discussed as objects instead of individuals with the agency of choice and as people belonging to vastly different contexts. This is again emphasized in these articles' photos of women of color holding their microcephalic children (Jr and Cobb 2016). Instead of focusing on the narratives and circumstances of these women, these photos often seem to serve as emotional leverage for the article's main point. While these photos call to the reader's pathos by personalizing and emphasizing the effects of Zika in individual women and children, they simultaneously bolster the framing of women as helpless, passive victims of Zika by not giving them a voice.

The emphasis on women as those predominantly infected constructs the image of women's bodies as vessels of infection and sometimes lends itself to language that hints at blaming women for infection. An article from the *DMN* proclaims that the "vagina is a welcoming home for Zika" and that "Zika flourishes in the vagina" (Yasmin 2016b). The article continues to explain how a recent study of mice gave evidence to the idea that Zika can live in the vagina and states that there has already been a case of a "woman spreading Zika to a man through sex." While these statements are factual, the phrasing of these facts plays into the stereotypes of vaginas as scary, foreign objects of disease (Beit-Hallahmi 1985). By discussing sexual transmission with emphasis on the vagina even when it is recognized that the Zika virus persists much longer in semen, this article objectifies all women as possible vessels of transmission and infection (Paz-Bailey et al. 2017). In addition to this article, sometimes women or infected women are placed as the subjects in sentences actively responsible for infecting their babies or partners, or as actively partaking in a risky activity that has led to their infection. Women contract Zika from traveling to known infected areas such as Latin America or having "unprotected sex"; they then "pass" Zika to their babies "in the womb" or "spread" it to their partners" (Yasmin 2016b). Not only does this active verb tense place blame on these women for infection, it also creates an "othering" of activities that lead to infection. This presentation creates a grouping of women who get infected as those who cross the border or visit Latin or South America and those who have unprotected sex. This gives false, subconscious security to women who read these articles that by not travelling to infected areas, and by not partaking in risky behavior, they can avoid infection. This "othering" of women who partake in "risky"



behavior sets up a division amongst women that places more emphasis on some female bodies over others as vessels of infection. This “othered” group of women is often poor, women of color.

When the articles focus on individual women’s narratives, whether white women or women of color, they are often represented in a way that fits into a greater narrative of female stereotypes and victimization. The representation of these female stereotypes within different countries and contexts favors the protection of white women’s health in the United States over women of color in developing nations, and constructs women of color in developing nations as assumed bodies of infection (Seidel 1993). The *NYT* considers many of the “tens of millions of women” failed by global health organizations as “impoverished slum dwellers” in opposition to the “white tourists” who have been better protected by travel advisories (McNeil Jr. 2017). While many impacted women in South and Latin America are indeed “impoverished” and it is important to recognize this intersectionality with Zika as another measure of oppression, identifying them as poor foreigners reaffirms poor, female bodies of color in developing countries as vessels for infection (Bova 2000). The *NYT*’s recognition of who will be predominantly affected by lack of global health action is a necessary critique. Yet when this critique gives no agency to women in developing nations and frames them as being completely dependent on Western health organizations and governments, these women are constructed as passive victims who have no control over their own health. Even in an article by the *NYT* that discusses Colombian women’s decisions to get pregnant by focusing on the individual narratives of Colombian mothers, emotion and “the burden” of having to make these decisions is emphasized (Jr and Cobb 2016). This plays into the stereotypes of women being unable to make decisions for their own bodies and also that their ability to make decisions is impaired by their emotionality, which is caused for instance by seeing their unborn baby’s face on a sonogram (Barrett and Bliss-Moreau 2009). The victimization and inability of these mothers is emphasized even more when the article describes one of them “who is 18 but looks 15,” creating the image of a child who is unable to care for her own child and who can only rely on the possibility of “miracles” (Jr and Cobb 2016). This focus on women of color from developing nations who are unable to care for themselves reaffirms and “others” these women as primary bodies of infection.

When white women are discussed in relation to Zika in the media, they were only mentioned as white tourists in Latin or South America or as women living in Miami-Dade

County. The *MH* depicts four narratives of pregnant women from Miami, and their approach to protecting themselves and their unborn babies from Zika. In the attached photos, at least three out of four of these women are white or white passing and one is donning a beekeeper suit that she wore for her pregnancy announcement photo shoot (Harris 2016b). These women are taking precautions such as completely covering up bare skin when going outside, spending the majority of their time “under house arrest” or leaving Miami completely. While some are facing the very real struggles of displacement or the fear of not being able to continue their careers, the article also discusses the unpleasantness of not being able to “play tennis anymore” or going “stir crazy” in their homes and turning to adult coloring books (Harris 2016b). While all of these sentiments and struggles are valid, the portrayal of pregnant women in Miami through four white, middle class women omits the narratives of many other women in a city that has been plagued by geographic racial divides for decades and is home to a diverse array of Caribbean, black and Latin American populations (amongst others) (Connolly 2014). This article presents pregnant white women as the most impacted women in Miami, while omitting and therefore devaluing narratives of women of color in the same geography. Similarly, the contrast between the white, American female tourist and the poor women of color in developing countries omits the existence of poor women of color in the United States who may be experiencing Zika through other realities beyond tourism. Many of these women face similar difficulties to women in developing nations such as poverty, lack of health care and access to government aid, but are not as heavily focused upon because they live in the United States - a country deemed fit by the media to deal with the Zika crisis, or who serves as the ideal for how Zika should be managed. This omission harms women of color in the United States even more so by not including them as a population who may be more adversely affected by Zika than the constructed identity of the white, American female.

The emphasis on women as people who need to be protected or as the point of attack for combatting Zika also belittles the greater contexts of government and religion that are disadvantaging women. Access to abortion in Latin and South American countries is discussed in many newspaper articles that often critique many countries for their harsh restrictions on abortion and birth control (McNeil Jr. 2017). Global health organizations and governments alike have been criticized for both encouraging delayed pregnancy, or advocating that women make their own decisions after becoming educated on the risks of Zika. Abortion is illegal in many

Latin and South American nations, and even where it is legal, it can be hard to get approved, or is often culturally unacceptable (Davies n.d.). Asking women to delay pregnancies is also difficult in countries where contraception is hard to access or culturally unacceptable. Lack of access to abortion or contraception is a known detriment to the growth and success of women, and is often the result of religious ties within government such as the Catholic Church's dominant presence in many Latin and South American countries (Grimes et al. 2006). This connection between access to abortion and Zika has yet to be readily discussed in the context of the United States beyond government funding. The *NYT* calls out the CDC's stance on women making their own decisions, and not advocating for abortion access, as a result of their funding ties to conservative politicians (McNeil Jr. 2017).. This emphasis on mothers and their babies in the discussion of Zika in American media plays into the prioritized protection of unborn fetuses in our country, and downplays the discussion of abortion as a viable option for American women in combatting Zika. The debate concerning Zika funding rests on the contentious point of whether or not to fund Planned Parenthood depicts how babies are still prioritized over women by the American government. Even though not all women would necessarily opt to abort a fetus infected with Zika, lack of discussion about abortion as an option for American women in addressing Zika in the media and government is a privilege that the United States has as a country that has yet to realize a full Zika catastrophe.

### *Development*

The Zika Virus has a diverse history of movement through different populations and geographies, and continues to evolve biologically and culturally through space and time. The globalization and movement of humans, mosquitoes and habitat has made Zika a global disease that has no respect for nations or borders. The only boundaries drawn around the virus are those that have been culturally or politically delineated between peoples as governments and health organizations attempt to categorize populations, monitor infection, and ultimately protect the health of their own nations. This discussion is characterized by descriptions of infections in different populations, the movement of Zika through different countries, and the differences in peoples and cultures that result in different public health responses. I have categorized the discussion of these themes within media as "development discourse," which considers how

American media and readership construct the idea of Zika through “othering” and colonial and post-colonial understandings of disease and the developing world. This depiction of development discourse is influenced by Seidel’s presentation of development as a “diachronic, historical perspective” that “addresses socio-economic determinants of health and health care” and calls for international “North-South solidarity” (Seidel 1993). While development theory commonly focuses on international relations between developed and developing nations, these themes exist within the United States across different racial and socioeconomic groups and across different states and geographies (McCarthy 2002). It is critical to understand how Zika is being constructed in terms of development themes, and how the inclusion of some narratives, and the exclusion of others, shape the construction of and response to the disease.

**Othering.** Othering is the act of associating someone or something, like Zika, that is foreign and unknown with something or someone different from oneself in order to create “barriers of exclusion” (Ungar 1998). Zika discourse commonly constructs the other as a feminine, person of color from the developing world – but can also more implicitly work to create “others from within”, people or communities within the United States that are considered different from the norm and associated with the disease (Reeves and Campbell 1994). This othering can be a result of differences in culture, race, socio-economics, or certain lifestyle choices or actions.

Zika, named after the Zika forest in Uganda, where it was first “discovered”, carries a similarly othered and exotic identity to diseases such as Ebola or West Nile Virus (Ungar 1998). As a disease that originated in and travelled through developing nations, American media represents Zika as foreign, raced, and of the “third world.” Within the media, the Zika virus has been described largely in terms of the populations and geographies to which it is endemic. These depictions are often characterized by tropes of developing nations - crowded, dirty, poor places with little sanitation or health care. The *NYT* describes those most affected by Zika as women who are “poor slum dwellers” who did not receive adequate advice from public health experts (McNeil Jr. 2017). These characteristics are not often imagined by the media as realities in the United States, yet they are important factors to consider in the spread of Zika within America.

The three major newspapers analyzed use similar images of the Brazilian or South American mothers holding their microcephalic children in their articles or up-close images of mosquitoes or mosquito abatement practices. While these photos are useful for relaying the

gravity of Zika to the public or information on its vector, the overwhelming use of these photos of women of color classify Zika as a disease of the developing world and not a disease of the idealized white, male, American identity. Additionally, as detailed in the “Women's” section, identifying Zika as a disease that is primarily a concern for pregnant women allows people who don't fall into that category to “other” Zika from themselves as a non issue as exemplified by two German tourists in Miami not considering Zika as a factor in their travels (Harris 2016a).

The progression of the *DMN* reporting on Zika cases is characterized at first by the identification of infected peoples as recent travelers to Latin American or the Caribbean in the first few lines of each article. When a case of infection could not be tied to international travel, the newspaper pointed to Texas' proximity to Mexico as a risk factor because “travel back and forth across the border is a way of life” (Martin 2016). However, this causation implies that people who cross the border are more at risk for Zika than others and often implicates entire communities as areas of possible disease growth. These communities are often communities of color and of lower socioeconomic status, reflecting the colonial framework that considers poorer communities of color as bodies of infection. This “othering” is also implied in an expectant mother's reaction to Zika in Miami in which she says Zika “seemed so far away in the jungle, and then it was in my backyard” (Harris 2016b). This perspective is a product of “othering” Zika as a disease of less-developed populations in African and South American “jungles”.

Across all American newspapers, the narrative of Zika progresses from it being an “unlikely” threat to being a very real concern affecting the American people. American health and government officials initially considering Zika as an unlikely threat to the United States is another form of othering in which people don't recognize the disease as a real problem, because they have been told it is not an issue for themselves as Americans, but an issue for people in developing countries. The issuance of travel bans or advisories is an example of physical, geographical othering, in which some areas are deemed safe and others unsafe (Staletovich 2016). These boundaries are often created or can be interpreted arbitrarily, yet concretely characterize certain areas as unsafe in the public's mind. However, because the spread of Zika relies on a variety of factors, drawing such clear boundaries belittles the possibility that other areas or populations are still at risk. This process of “othering” in relation to Zika intensifies boundaries between geographies and communities and delays political response because it constructs Zika as a non-issue for the white, wealthy, male identity that is prioritized in

American society (Seidel 1993). Constructing Zika as “other” allows people to draw imagined, false and unhelpful boundaries between themselves and those at risk for the disease.

**The Emerging Diseases Worldview.** The Emerging Disease Worldview (EDW) is a post-colonial construction of global health that focuses on the intersections of security, disease, and commerce that have come to define how international disease threats are globally addressed (King 2002). While colonial views of global health feared the infection of European bodies by moving into an infected space, postcolonial views are characterized by a fear of infected bodies moving into an uninfected space (King 2002). The increasing globalization of people and goods has led to disease and epidemics becoming an issue of national and global security. The Emerging Diseases Worldview defines postcolonial global health as a global network of health data and technologies that are controlled and created by Western countries, particularly the United States, to be used on a global scale to monitor and recognize possible disease threats (King 2002). This network is intended to give developing nations the scientific and technical capabilities to identify and address a disease threat before it can spread to other nations. However, the ways in which this network is created renders some parts of the network more important than others, and still maintains the form of the developed world interfering with and controlling developing nation’s health governance in Western interests (King 2002). Relying on the “sustained American faith in technological fixes” that defines the EDW also “ends the consideration of social or structural remedies to international health problems” and instead “establishes a framework in which participation in global public health is conducted upon a terrain already colonized by market relations and logic of exchange (King 2002).” Defining characteristics of the EDW such as reliance on technology and the dominance of health organizations from developed nations in Zika discourse are evident in American media.

One theme that resonates between the EDW and Zika in American media is the implied recognition that the Zika virus only became a concern in international politics and on the global stage when it began to affect the United States. The *NYT* describes how only when Zika “hit almost every country in the Western hemisphere” did governments “swing into action” (McNeil Jr. 2017). A *NYT* article also likens Zika to HIV as having an overwhelming and overlooked presence in Africa, but not being “discovered” until noticed in a developed nation (Adams and Nutt 2016). This lack of media international focus on these diseases in developing nations is also

evident in the framing of Zika's progression by different news sources and its overall omission in media and international health governance until it entered South America and became an immediate threat to the United States. While the earliest articles considered in this study regarding Zika appeared in January of 2016, the virus existed as an unnoticed disease in Africa because for decades "no one was looking for it" (Adams and Nutt 2016). Additionally, the *NYT*'s statement that the "Zika Response has failed millions," is a colonial assumption that Western, developed nations and organizations such as the CDC and WHO have failed millions because it is their responsibility to care for developing nations through global health aid (McNeil Jr. 2017). An *NYT* opinion piece states, "the data on Zika seems to matter only when it helps those of us in rich countries protect ourselves," as Zika has been known in Africa for over seventy years (Adams and Nutt 2016).

Another characteristic of the emerging diseases worldview is a reliance on American technological fixes for global health problems - for Zika this means a vaccine and abatement pesticides. While mosquito abatement and transmission prevention are presented as immediate, short-term fixes, a Zika vaccine is portrayed as the long-term goal for Zika prevention. The *NYT* discusses a Zika vaccine in their Business section as an economic and public health "opportunity" (Thomas 2016). The three newspapers analyzed intermittently discuss the progress of the Zika vaccine, and the Brownsville Public Health Department spokesperson interviewed referenced a vaccine as the ultimate solution (Hernandez 2017). The abatement and education measures being taken by the department were considered the best temporary option to avoid transmission while the vaccine is being produced (Hernandez 2017). However, in an opinion piece, the *NYT* recognizes the inequities of which communities a Zika vaccine would be created for - not for impoverished and heavily affected people in the developing world, but rather for those who can pay for it (Adams and Nutt 2016). Another "technological fix" driven by global health organizations are the insecticides and larvicides used in mosquito abatement. While the *NYT* presents a statement by "public health experts" that Miami is the only city to have taken proper abatement measures in the western hemisphere in response to Zika - implicitly valuing the use of chemical abatement and Miami's organization over other cities - they disregard the controversy of using these methods in developing nations (McNeil Jr. 2017). The *DMN* briefly mentions the struggle in Puerto Rico over the CDC attempting to use Naled, an abatement chemical, and the resulting protests that eventually led to no spraying (Farmer 2016). While

these technological fixes seem necessary and logical in the pressing context of the Zika epidemic, focusing on these methods as the only ways to address Zika ignore and propagate systemic inequities that also contribute to the severity of Zika, like suppressing the voices and opinions of people in developing nations where these technologies are being deployed.

Populations of developing nations are also disadvantaged in this global health network, as these communities are sometimes used as trial groups for vaccines or populations to gather scientific information (Lurie et al. 1994). While these areas are those with the greatest mosquito and disease presence due to environment and other factors, the involvement of Western scientists and officials and often the belittling of local scientists reveals an unequal power relation of Western control over health in these areas. The *NYT* discusses the creation of a Zika vaccine and how “some clinical trial organizers are trying to start their tests in South America over the next few months” (Thomas 2016). While tests for Zika vaccines will be held in developing nations of South America, an *NYT* opinion piece recognizes that these vaccines are only being created due to the economic incentive of possible infection in countries like the United States and Brazil. Additionally, while it is true that “an outbreak of Zika provides an ideal testing ground for a vaccine, so the preventive medication can be evaluated in a population exposed to the virus,” using a community that is experiencing a Zika epidemic creates an unequal relationship of power between researcher and test subject (Lurie et al. 1994). Especially when a researcher has the backing of a Western health organization or biotechnology company, and the proposed test subject risks suffering from a life threatening disease, many people would be willing to comply. While this may seem like participant and researcher both benefit from this relationship, the fact that the final product of these tested vaccines will likely never reach these communities reveals that these people are being used as a Western “petri dish” to better the health of developed nations and ultimately to make a profit.

In media’s depiction of international relations between the United States and South America in combatting Zika, it is evident that Western or American “nodes” or pieces of the global health network are more valued in the system than those of developing nations (Sassen 2002). The valuing of American scientific work over efforts of Brazilian scientists also provides evidence that some “nodes” in this global health network are more important than others. A Brazilian scientist of the Oswaldo Cruz Foundation claimed that “The C.D.C. would not accept it until they had done it themselves,” referring to the discovery of Zika in amniotic fluid and the



microcephalic brain of a fetus (McNeil Jr. 2017). This delegitimizing of scientists in developing nations reifies the position of power American and Western health organizations have in the global health network. This importance of Western or American nodes of the network is also shown in the funding decisions of congress, in which money initially put towards researching Ebola in Africa and therefore directly helping African nations would be shifted to Zika response funding in the United States (Thomas 2016). This difference in value across the global health network is also called into question by the WHO, which no longer considers Zika a state of emergency. While one news source recognized that the WHO was shifting towards a more long-term approach to Zika, this declaration of non-emergency was presented as a downgrading in severity in other newspapers. However, Zika will remain an unsolved and recurring issue in many parts of the world, and framing Zika as no longer an emergency, whether by the WHO or by American newspapers, belittles the continued severity of the disease and the importance of finding a way to address it. Claiming Zika to be no longer an emergency, with no further explanation, implies that Zika is no longer an emergency for the United States due to the abilities of American healthcare, abatement and environmental conditions. Additionally, the framing of Zika as an “opportunity” for Western biotech companies with the recognition that the Zika vaccine is now economically viable places more importance on developed countries in the global health network because they can pay for a vaccine. The Western control of these biotech firms and vaccine creation also gives more power to developed nations in the global health network. Additionally, because these companies’ aims to help the public good are convoluted by profit, developing countries that cannot contribute to this profit are less valued in the creation of this vaccine.

**Poverty and People of Color.** While developmental discourse and theory is often applied to international relationships between developed and developing nations, these lenses can also be applied to relationships between government, communities and peoples within the United States. Development theory compares the less developed to the developed on a nation-to-nation scale; applying this logic to domestic relations within the United States can be used to compare a less privileged, lower socioeconomic, group of people of color to a “more privileged,” whiter, wealthier group.

Poverty is a controversial factor when considering the growth and spread of Zika. From a colonial perspective and since the times of British workhouses, poverty and small living spaces have been associated with dirtiness and disease (Hamlin 1998). Poverty is pointed to in a number of articles as a cause or at least contributor to Zika in the favelas of Brazil or poorer areas in other South American nations (Garcia-Navarro 2016). This connection is tied to the assumedly increased presence of trash in poor areas that can serve as habitat for mosquito larvae. Within poorer areas of the United States, this has been associated with old tires or illegal dumping in areas such as parts of Baltimore, Maryland or Brownsville, Texas (LaDeau et al. 2013). This connection between poverty and Zika can also be drawn as the mosquito that transmits Zika is anthropophilic and would therefore exist in larger numbers in areas of high-density human populations.

However, while some newspapers, researchers and even the WHO have drawn this causation between poverty and Zika, it is still a controversial conclusion with problematic repercussions. The three officials I interviewed each had a different opinion and experience with the relationship between poverty and mosquito-transmitted diseases. The director of the Alameda County Mosquito Abatement District did not recognize any connection between poverty and mosquitoes, but found the opposite to hold true. In California, he recognized that wealthier areas that had greater irrigation for personal gardens were more likely to have increased occurrences of mosquitoes than poorer neighborhoods, although he also found that abandoned pools posed a major risk for mosquito growth and that these abandoned pools could be the result of different states of poverty (Clausnitzer 2017). The official from the Brownsville Department of Public Health drew very close connections between the poverty in poorer, Hispanic communities and increased risk of mosquito-borne disease because of the presence of old tires, and detailed the constant education effort to get people to remove them from properties (Hernandez 2017). The official from the New Orleans Public Health Department did not necessarily draw any connection between poverty and mosquito-borne disease, noting that poor neighborhoods or run-down properties were interspersed in wealthy neighborhoods and homes, so any connection between mosquitoes and poverty would also hold true for wealthier areas (Babcock 2017). *NPR* released a piece stating how research on the topic has produced mixed results and how Brazilian officials countered the WHO's warning of avoiding favelas during the Rio Olympics with countering points such as mosquitoes prefer clean water to lay their eggs in and that human

movement is much more influential than poverty for disease transmission (Garcia-Navarro 2016).

While poverty may not be directly correlated with disease transmission, depending on certain contexts and geographies, it is important to recognize the intersectional contribution it could have on those infected by Zika. Poverty is an assumed frame for discussing Zika in developing nations, in that these populations are assumed to be of lesser wealth than those in the United States, but this socioeconomic distinction within the United States is not as commonly discussed as a risk factor for public health in American media. The *NYT* depicts tens of millions affected by Zika as “impoverished” and “slum-dwellers” while the only time poverty is mentioned in reference to Americans is when the homeless or women on Medicaid are given free mosquito repellent (Rice 2016, McNeil Jr. 2017). Other articles were found outside of the three main focused newspapers that drew conclusions between living in poverty and mosquito growth in areas such as New Orleans (Szabo 2016). While poverty can serve as another form of othering, it is important to consider what this connection of Zika and poverty means for those living in poverty.

Often, people in poverty experience a number of other oppressive intersectionalities such as race or gender (Unterhalter 2012). People in poverty lack access to social and cultural capital and hence less able to rebound from health or economic setbacks or have the ability to care for a disabled child (Massey 2007). Areas of poverty in the United States have also been physically and geographically built within cities over time due to various restrictive policies such as redlining or racialized movements such as white flight (Connolly 2014). Often these areas are sectioned off away from wealthier areas, exemplified in cities such as Chicago or Miami. Similar to how white Americans living in the suburbs were found to think gated neighborhoods necessary for protection from “bad (often raced) people” outside, attaching Zika to poverty creates imagined areas of disease and also works to construct Zika as a disease of the poor (Low, Setha 2001). Inadequate health resources in poorer areas may turn this imagined identity into a reality if Zika ever spreads widely in the United States.

## Comparative Content

Differences in language, text and framing between the *NYT*, *DMN*, and *MH* articles constitute comparative content. Newspaper articles are meant to educate, report and inform. They do this in different ways with different focuses, graphics and by speaking to certain populations, educations and geographies. By analyzing predominantly the *NYT*, *DMN*, and *MH* patterns of how Zika discourses were created and communicated emerged within the articles of each newspaper. While not completely unique to each paper, discussions of Zika took on different characteristics within each newspaper largely due to the newspapers' different focuses in reporting and audiences to which they communicate. The differences of Zika discourse in each newspaper are characterized by writing style, geographical and content focus, and graphics such as maps and photos.

The *NYT* tends to take a broader, more critical, international view that focuses on the wider implications and long-term effects of Zika. The *NYT* articles discuss Zika across a spread of nations including Colombia, Brazil, Texas, Florida, New York, Uganda and the Caribbean. These articles also more broadly focused on issues of Zika at a national scale and between different international bodies. The *NYT* has written Zika-related articles on scientific research in Uganda, international biotech and the creation of a vaccine, and the tourism economies of Florida, Mexico and the Caribbean (Kron 2016, Vora 2016). The *NYT* also tends towards more critical, in-depth articles that critique the domestic and international interactions of health organizations and governments with cities, states, and nations. The *NYT* critiques the Zika funding slowdown in American Congress and associated Republican lack of action with religious leanings, the WHO for ending the "emergency" status of Zika, and the global public health response that in their words "failed millions" (McNeil 2016a, McNeil Jr. 2017). The *NYT* emphasized the underlying and controversial causes and implications of Zika, such as access to abortion, the profit-over-people motive of biotech companies and that white tourists were much better served than people of color in developing nations by public health officials in what the *NYT* quoted as a "racist tragedy" (McNeil Jr. 2017). The *NYT* also tends to write longer articles than the other two newspapers analyzed and seemingly pulls from a more advanced vocabulary (even though most of the articles read were written by the same author). These stylistic tendencies and focuses in content speak to the *NYT*'s international and national-level audiences.

The diversity of the Zika discussion in *NYT* articles is also demonstrated by their photography - they rarely used the same photo twice and include photos from multiple countries that focus on people, places, and actions. However, while the *NYT* includes portraits of people affected by Zika in developing countries, pictures of places are used instead of people when Zika is described in an American context.

The *MH* and *DMN* tend to focus more on their specific geographies and the issues their audiences, cities and states more directly face. The *MH* speaks almost exclusively of issues in Florida, and branches out to discuss Zika occurrences in other places in reference to their own issues. The *MH* primarily reported updates on the progression of the Zika Virus in Miami by sharing affected locations and number of infections. Overall the *MH* had a very critical tone, as a majority of its articles focused on holding local government officials accountable. The *MH* criticized the local government for withholding or misconstruing infection counts or locations that had tested positive for Zika-carrying mosquitoes (Chang 2016c). The *MH* eventually sued the local government for the locations of traps that caught Zika-carrying mosquitoes in Miami and won its case. Among the newspapers analyzed, the *MH* was the most invested and intense in their writing on Zika and protecting their local constituents. It was most likely among the other three newspapers to discuss the controversial insecticide Naled, brought up problematic implications of Miami's tourism economy and public health, and reported the most direct experiences of Zika of local residents, including those of pregnant women and local business owners. The *MH* also employed the most interactive and diversified methods of communicating with their audiences and focused the most on preventative measures. The *MH* primarily used photos of local places, government officials, and abatement practices in addition to multiple maps that delineated the progression of areas inundated with Zika. The *MH* also created a "Daily Zika Tracker" for the entire state of Florida that counted growing infection numbers in each county and frequently employed video that shared important information or preventative measures about Zika (Dapena and Franco 2017).

The *DMN* tended to focus on local news surrounding Zika such as recent infection and travel warnings. There is also an evident shift in the *DMN* articles marked by before and after the first infection occurred in Texas. Before this, the *DMN* focused on Zika and infections related to travel cases with Latin and South America before focusing on Zika as an increasing concern for Texas (Martin 2016). The *DMN* reflected its "right-center" or "moderately

conservative” bias in conversations of national Zika funding in which “Texas Republicans [pressured] Obama for funding” or the *DMN* supported one Senators push for being “fiscally conservative” with Zika funding (“Dallas Morning News – Media Bias/Fact Checking” n.d.). Photos of mosquitoes or microcephalic babies predominantly characterize the graphics of the *DMN*, with a few photos of Texas senators or government officials in relation to discussions of funding. The only photos that reflected Zika in Texas were those of government officials and the few videos that were posted were of the author of the article reiterating important points. The *DMN* also commonly used a very informal tone with non-technical language to describe scientific issues of Zika, recounting information in almost a blog-style, first-person report of the author. The *DMN* also has a “Debunked” section in the newspaper - unique among the other newspapers - that analyzes and disproves common misconceptions or conspiracy theories. An article was posted in this Debunked section explaining how genetically modified mosquitoes were not spreading Zika (Yasmin 2016a). This conspiracy theory and other misconceptions were not addressed in the other newspapers and to even consider this issue worth discussing implies a certain perspective unique to *DMN*.

The differences in Zika discourse depending on newspaper plays a critical role in how different readerships understand Zika. The graphics included, styles used and geographies and issues focused on, shape how people and government officials perceive issues as most important. While the *NYT*, *MH*, and *DMN* all have a different means of presenting Zika, there were patterns and themes in content that arose in the content of articles across all three newspapers.

## **Limitations**

The scope of this project and discussion is innately limited by the nature of the data focused on and the limitations of the analysis applied to this data. My results and conclusion are constrained by the particular articles and newspapers I chose to focus on, and the given time period from whence these articles came. The themes representing “American media” in my discussion are primarily from the *New York Times*, *Miami Herald*, and *Dallas Morning News* and are therefore biased by the tendencies and geographies of these newspapers - some of what I have tried to elucidate in the background section and form section of the discussion. The discussed themes are more accurately themes present across these three newspapers, rather than

all of American media. I collected the articles in January of 2017, which also limits my analysis to the articles released prior to that time and does not consider any recent contributions to the Zika discourse or progressions in understanding the disease.

My discussion is also limited by the constraints my analysis of the collected articles. Due to time constraints and feasibility, I was unable to do an in-depth and methodical discourse analysis for each article on specific characteristics of language and framing, and instead took a more wholesome or big-picture approach to the analysis. While this approach resulted in broader understanding of themes in Zika discourses in American media, there is much opportunity to expand this analysis with a more focused discourse analysis or by applying these methods to more American newspapers over a greater timescale. There is also room to expand upon this analysis as the Zika discourse develops and evolves in the future. While this paper gives a brief view into the trends of developing Zika discourse, it identifies specific themes and frames that are important to study from their origins and as they progress to better understand how the Zika virus and resulting public health response are constructed in American media and therefore in American society and government.

### **Broader Implications**

How an issue is discussed in the media influences how people conceive of the issue, how they view those affected, and how decisions are made in addressing the problem. Focusing on certain narratives or frames, while omitting others inherently favors the well being of some over others - often those who are considered a part of the more important majority. While this paper gives a brief view of the developing Zika discourse in American media, the themes and frames identified in this discussion exist in broader conversations across many different formats and mediums. They interact with one another, people's experiences, and existing structures of power to construct an imagined idea of Zika that produces tangible societal and physical effects. The language used to discuss the Zika Virus in American media, everyday conversation, academic research and medical interactions also influence and shape policy and public health responses to the disease.

*Government and Policy*

The discursive frames I have identified exist within local and national government policy, and are helpful in analyzing for whom policy is written, what it is trying to address and why it may or may not be effective. Media and government work together in constructing Zika, as media reports on government action and policy, and also works to shape public opinion and perception from which government action is (ideally) derived from. Government response to Zika takes the form of funding policy, emergency response plans, and official stances and information held by the CDC and more local public health offices. These government responses are characterized by the dominant themes of the medical moment and economic discourses – partially out of necessity and partially because this is what is expected of policy in a public health crisis.

The most recent Congressional bill appropriating funding for Zika is *The Continuing Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations Act, 2017 and The Zika Response and Preparedness Act (H.R.5325)* (Graves 2016). This bill gave appropriations to the Department of Health and Human Services to “prevent, prepare for, and respond to the Zika virus, health conditions related to the virus, and other vector-borne diseases domestically and internationally” in addition to the Center for Disease Control, The National Institute of Health, the Office of Secretary of Public Health and the Social Services Emergency Fund (Graves 2016). The Department of State was also given funding to expand international efforts and aide to combat Zika. This appropriations response aligns with the patterns of the Emerging Disease Worldview, in which the US government pays for international aide such as through the “Bilateral Economic Assistance of Global Health Programs” and “USAID” to reduce Zika abroad in order to lessen the domestic threat of Zika. As an appropriations bill, there is no specificity regarding the issues that will be addressed with this funding, but only to whom this money will be given. Funding is a necessary step in addressing Zika, but it is critical to recognize that the epidemic is contextualized in who is given funding and how much funding is given. The efforts and effectiveness of national and state Zika response will be dependent on how governmental departments are limited or supported financially. Economy and financing are therefore unavoidably prioritized in the Zika response, alluding to the economic frame seen in discourse.



The United States Government Zika Virus Disease Contingency Response Plan is a supplemental plan that discusses the bureaucratic organization of government departments in responding to Zika (“United States Government Zika Virus Disease Contingency Response Plan - zika-response-plan2016.pdf” n.d.). The plan breaks down the time steps of the disease entering the United States to be “indicators” such as increased Zika cases in a locality, “triggers” such as confirmed local transmission by mosquitoes, and “actions” such as spraying or abatement measures. The plan continues to outline the specific roles of each governmental department in addressing Zika and specifies that the Department of Health and Human Services is the lead facilitator. Beneath their oversight, there are three task forces that focus on Domestic Impact Reduction, International Assistance and Engagement and Communication and Information Sharing. The objectives of the Domestic Impact Reduction task force focus on “pregnancy and birth defects”, “disease surveillance”, “epidemiology”, “vector surveillance and control” and “state coordination”. This delineates the main threats of Zika and subsequent action steps considered by the United States government in addressing Zika. The language and focuses of these groups aligns with the medical moment frame. The immediate risk group of pregnant women and their fetuses is prioritized as first in the list of groups, paralleling almost every article on Zika that first focuses on the risk of pregnant women being infected and the frightening symptoms and possibility of microcephaly. The focus on disease surveillance, vector control, and epidemiology is a very broad and top-down approach that doesn’t speak to the needs of specific or local communities and further perpetuates the medical moment frame by emphasizing this viewpoint. Additionally the International Assistance and Engagement task force focuses on “traveler health” and “sample sharing” which echoes themes of the Emerging Diseases Worldview. “Sample sharing” between nations works to provide a global network of public health in which the Emerging Diseases Worldview considers Western scientist and nations holding power to benefit the health of Western, developed nations (King 2002). Focusing on “traveler health” also emphasizes that the main concern for international health is how it will affect domestic health, which deprioritizes the health of people in developing nations. This response is presented in the medical moment frame as it emphasizes general tactics for quickly reducing transmission by focusing on risk groups and vector control.

The Center for Disease Control’s (CDC) Interim Response Plan for Zika outlines the specific steps states and localities should take to prepare for possible Zika transmission and or in

the case of a confirmed transmission. These steps are broken down into three phases: the first discussing pre-infection preparedness, the second discussing what to do in the case of a confirmed infection, and the third discussing what measures to take in the case of a multi-person transmission (“Draft Interim Zika Response Plan - zika-draft-interim-conus-plan.pdf” n.d.). This plan aims to integrate local and state authorities with national information and aid directed by the CDC. Beyond having many characteristics of the medical moment frame, this plan also implies developmental frames. This report recognizes the importance of media, as within each of response phase, the CDC is responsible for communication with and the sharing of accurate information to the media and states. A focus of this communication is recognizing, “pregnant women, women of childbearing age, and their partners” as at-risk, vulnerable groups and that they should be presented as such in the media. The CDC mentions other “vulnerable groups, but does not delve into who might be a part of them. Other “vulnerable communities” could speak to groups that are vulnerable to Zika due to socio-economic, ethnic, or cultural reasons, but this is not directly stated. Under what is considered phase three, when “multi-person transmission is occurring”, the plan includes “[Preparing] messages to address stigmatization of certain communities” under its communication section, but likewise does not discuss who these “certain communities” are or what these “stigmatizations” may be. The plan provides a background section outlining the environmental factors that contribute to the spread of Zika and how this will differentially affect areas of the United States, but concludes that a “consistent response” is needed that can be applied to all states. The plan also provides guidelines for creating geographical boundaries of infection that include environmental and ecological factors, human factors, mosquito surveillance and control factors, and infrastructure factors. Creating a “consistent plan” or providing a succinct list of factors to consider, leaves space for these vulnerable communities who don’t often have a voice in local authority to fall through the cracks. Additionally the plan recognizes that characteristics of high human density and “homes, workplaces, and other settings” without screens, doors, or secured water catchment systems all constitute reasons to include an area within a Zika zone of transmission. These are all characteristics that are often associated with poverty and poor communities, yet the plan does not go into detail of the possible economic or social effects of a geographical ban or how to better support these communities. Similarly, there isn’t mention of a plan to provide these areas or people with better housing, but only to quarantine the area they live in as a Zone of infection.

Government policy and reports are predominantly presented with a focus on the medical moment or economic frame. This is largely due to how government response, aide and public health is structured in the United States. Creating top-down directions and creating a network of authority invariably lessens the voices of marginalized communities (Massey 2007). While these plans and responses are supposed to be locally integrated on a state and city level, they rely on those who already have power, authority and access to funds to make these local decisions and implement these plans. Marginalized communities do not often have voices in already-existing structures of government (Connolly 2014). With already limited funding, as evidenced by New York's and Florida's call for more money, communities who do not already have access to healthcare or who are unable to access government resources may experience greater harm from Zika than those who have this access. Additionally, while not recognizing and naming certain marginalized, at-risk groups may reduce stigmatization, it further omits their experiences and lessens their voices in policies that affect their wellbeing and livelihood.

### *Greater Public Health Discourse*

These resulting frames are not unique to discourse of the Zika virus, but can be recognized in the construction and discussion of many past public health crises. This is partially due to the category of “emerging diseases” inspiring a “proliferation of instant critical analyses of policies and practices seeking to interpret the cultural and social factors at play within them(Wallis and Nerlich 2005).” While they may not have the same names, many characteristics of the discourse of Zika parallel past discourses of HIV/AIDs, SARS, and Ebola. Strong patterns emerge surrounding the medical moment discourse that clarifies what characterizes the “medical moment” of Zika, and other critiques of past public health crises relay similar themes to the development frame of Zika. These patterns are not coincidence; how Zika is framed in discourse is informed by how past public health crises have been framed. Characteristics of Zika discourse that influence and shape understanding of Zika speak to a greater understanding of how we understand public health crises in general and how these understandings are constructed in media.

Discourse of the Ebola outbreak in Zaire of 1995 shares many similarities with Zika discourse including themes in the medical moment, women and gender, environmental, and

development frames. Ungar analyzes fear, media, Ebola and emerging diseases through a discourse analysis similar to Gamson and Modigliani (1989), and creates a frame or “discursive package” of “mutation-contagion”. This package has many similar characteristics to the medical moment frames, and was used to describe a variety of emerging diseases prior to the 1990s. The “mutation-contagion package” is centered on a “frightful core” and is characterized by themes such as “microbes knowing no boundaries” which speaks to similar fears of globalization in the medical moment discourse. Additionally themes of “microbes on a rampage” which is characterized by dramatizing disease symptoms and reporting infection rates, and “Engineering Microbial Traffic” which is characterized by humans invading wild spaces or diseases invading human spaces, align with characteristics of the medical moment frame of Zika (Ungar 1998). In trying to reassure people against this frightening portrayal of Ebola, media began to associate and causate it with failed political systems and poverty of the “Third World” in comparison to the cleanliness and organization of the United States and CDC. Similar to how the Zika Forest was framed as a “petri dish for virologists”, Zaire was framed as having “conditions perfect for breeding the plague” (Ungar 1998). Fear of Ebola increased as it was othered as a “disease from elsewhere” in media and an “exotic jumper virus from an unknown host in the rainforests of Africa”. However Ungar also recognizes that this process of othering can create “others from within,” which is occurring in the discourse of Zika pertaining to poorer areas or women. Additionally, Ungar states how the “metaphor of otherness serves to protect those outside of Zaire”, which is a similar sentiment that can be seen in the *DMN* coverage as a disease of Mexico before it arrived in Brownsville. Ungar also claims that emerging diseases that could cause a “hot crisis” or a very real panic often “arise in distant or marginalized populations” such as that of the third world. Ungar describes how themes of globalization and othering are used in the media – globalization to cause fear and action, and othering to provide reassurance and separation. These themes of fear through uncertainty and reassurance through certainty are also evident in the medical moment frame of Zika.

Research on HIV/Aides discourses is extensive and has shaped how discourse and disease is considered in multiple contexts; many themes and frames that characterize HIV/Aides discourse can also be seen in Zika discourse. The “military discourse”, which is not specific to the discourse of HIV/Aides presents emerging diseases as an invading army or something to declare war on, like the “War on Aides”. This framing is evident in pieces of the medical

moment discourse such as the emphasis on control and government authority (Wallis and Nerlich 2005). “Othering” was also evident in discourses surrounding HIV/AIDs, in which it was presented as only a “homosexual disease”. This created a “strong resistance” that lasted into the 1990s in understanding HIV/AIDs as a disease that could be heterosexually transmitted (Ungar 1998). Women have also been presented as “vessels of infection” in transmitting HIV, which aligns with how women have been presented in Zika discourse (Bova 2000). HIV/Aides discourse also included discussion of a “lost generation” or the harmful life effects women could experience from having HIV/Aides, which aligns with a similar concern for women who birth babies affected by Zika (Preston-Whyte 1994). In a discursive analysis of how HIV/Aides was constructed across Africa by international organizations, governments and local groups, Seidel (1993) identified six dominant discourses. Some of these aligned with the frames found in Zika discourse including development and medical discourses (Seidel 1993). The construction of these discursive frames for Zika were inspired from Seidel’s work as characteristics found in Zika discourse mimicked how HIV/Aides was constructed. Zika’s representation in discourse also aligned with some of the frames and themes of SARS discourse in newspapers of the United Kingdom. While it was found that SARS was not necessarily identified with a specific locality, it was implicitly othered by race as a Chinese disease by commonly using photos of Chinese crowds wearing masks (Wallis and Nerlich 2005). While SARS may not fall under the “epicenter” discourse, the frame of identifying a center of disease, the epicenter discourse was evident in the earlier states of Zika and pointed to Brazil and the Rio Olympics as the origin. SARS discourse “was over a more extended physical space – towns, cities, regions and countries” that created “leaky and permeable” boundaries to disease similarly to how the Zika’s mosquito vector is viewed as uncontrollable (Wallis and Nerlich 2005).

Across all discursive frames of Zika and in past public health studies, fear is an overarching theme that is powerful and important to recognize. As Ryan Clausewitz of Alameda County Mosquito Abatement District said, “People react to Zika in three ways: 1) they don’t care, 2) they don’t know, or 3) they’re crazy terrified” (Clausnitzer 2017). As a category, emerging diseases cause a mass media response and public concern in part because they are scary, unknown and uncontrolled - “When fear is involved, people react en masse (Berry et al. 2007)” This fear seems to arise from the uncertainties within every disease and discourse. People are afraid of what they don’t know or don’t understand. Newspaper articles spell out this fear in

reporting on the possibilities of answers to questions they can't answer. Within the medical discourse, doctors and public health professionals don't know the long-term impacts of Zika or how or why microcephaly develops at different points in pregnancy. There is no guarantee of a vaccine. In the economic discourse, the unresolved epidemic threatens the livelihoods of people who live in endemic areas or are tied to local tourism. Women of color face the reality of being more greatly affected and further disadvantaged when affected by Zika and the virus calls into question once again the fight over women's control over their own bodies. This immediate fear that has permeated discourses of HIV/Aides, SARS, Ebola, and now Zika, allows for dominant discourses to overshadow others, and overwhelm a long-term and in-depth reflection on the structural changes that need to be made in order to better prepare for these public health crises.

## **Conclusions**

Discursive frames of Zika do not exist independently in language, nor separate from policy or past public health discourses, but interact with all of these to construct different understandings of Zika. We must understand that how we discuss and construct Zika has real effects and can further marginalize already vulnerable communities. Focusing only on reactionary discourse such as the medical and economic frames, will not help us effectively and equitably address Zika or any other public health issue, because vulnerable communities, such as women and people of color, are not often given an independent voice in this dominant discourse. Focusing only on these themes supports the current prioritization of medical and economic interests in public health policy over the interests of less-influential voices. Similar themes of urgency, control and fear have dominated past discussions of public health crises and continue in shaping that of Zika. We must consider more critical, long-term discourses such as women and gender, environment and development frames that address systemic issues of inequity and the voices that are not contributing to discourse at all. In doing so, we might hope to alter these patterns in discussing public health crises and better include these lost voices to create policy that meets the needs of vulnerable and more marginalized communities. By recognizing these discursive patterns surrounding Zika and across the discourses of other public health crises, we may hope to better approach emerging diseases in the future.

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## Appendix A: Article Information

<b>Ref. #</b>	<b><u>Headlines of New York Times Articles</u></b>	<b><u>Date</u></b>	<b><u>Author</u></b>
1	A Zika Vaccine, but for Whom?	28-Dec-16	PATRICK ADAMS and CAMERON NUTT
2	Air Travel Between U.S. and Zika-Affected Areas	6-Feb-16	SERGIO PEÇANHA and TIM WALLACE
3	Colombia Is Hit Hard by Zika, but Not by Microcephaly	31-Oct-16	DONALD G. McNEIL Jr. and JULIA SYMMES COBB
4	Colombia Reports Major Rise in Birth Defect Amid Zika Crisis	10-Dec-16	DONALD G. McNEIL Jr.
5	Despite Shootings and Zika, Florida Tourism Remains Strong	10-Jan-17	SHIVANI VORA
6	Extensive Brain Defects Seen in Babies of Mothers With Zika	13-Dec-16	DONALD G. McNEIL Jr. and PAM BELLUCK
7	How the Response to Zika Failed Millions	16-Jan-17	DONALD G. McNEIL Jr.
8	In a Remote Ugandan Lab, Encounters With the Zika Virus and Mosquitoes Decades Ago	5-Apr-16	JOSH KRON
9	Local Transmission of Zika Virus Is Reported in Texas	28-Nov-16	DONALD G. McNEIL Jr. and MANNY FERNANDEZ
10	Microcephaly Found in Babies of Zika-Infected Mothers Months After Birth	22-Nov-16	PAM BELLUCK
11	New York City Has 5 Babies Born With Zika-Related Brain Issue	7-Dec-16	MARC SANTORA
12	No New Local Zika Transmissions in Florida, Governor Says	9-Dec-16	LIZETTE ALVAREZ
13	One Family's Struggle With Microcephaly, the Birth Defect Now Linked to Zika	17-Oct-16	MARC SANTORA
14	Pregnant Women Warned to Avoid Brownsville, Tex., Because of Zika	14-Dec-16	DONALD G. McNEIL Jr.
15	Review: 'Zika' Tracks the Trajectory of an Epidemic	28-Jul-16	LAURIE GARRETT
16	The Race for a Zika Vaccine	19-Nov-16	KATIE THOMAS
17	Zika Fears Fading, Renewed Interest in Caribbean and Mexico	16-Dec-16	SHIVANI VORA
18	Zika Is No Longer a Global Emergency, W.H.O. Says	18-Nov-16	DONALD G. McNEIL Jr.
	<b><u>Headlines of Miami Herald Articles</u></b>	<b><u>Date</u></b>	<b><u>Author</u></b>
19	A to Zika: We answer all your questions about the Zika virus	5-Aug-16	ALEX DAUGHERTY, ELIZA DEWEY and JOAN CHRISSOS
20	Bit by Zika, Miami-Dade hotel taxes in first slump since Great Recession	3-Feb-17	DOUGLAS HANKS
21	Florida's Zika undercount hides extent of virus' spread, experts say	10-Sep-16	DANIEL CHANG
22	Gov. Rick Scott lifts last Zika zone in Miami Beach, but isolated cases still expected	9-Dec-16	JOEY FLECHAS and DANIEL CHANG
23	Is insecticide sprayed to fight Zika a risk for people and wildlife?	12-Aug-16	ANDRES VIGLUCCI
24	Miami Beach residents not told when Zika-positive mosquitoes found nearby	28-Sep-16	DANIEL CHANG
25	Miami Beach tourism takes a hit from Zika: demand drops, cancellations rise	22-Sep-16	CHABELI HERRERA
26	Miami may have Florida's first locally acquired case of Zika virus	19-Jul-16	DANIEL CHANG

27	Miami-Dade County hit hard	3-May-17	KARA DAPENA, DAMIAN FRANCO and CHRIS WILLIAMS
28	Moms-to-be go the extra mile to avoid Zika. Just ask the one in the beekeeper suit.	21-Oct-16	ALEX HARRIS
29	Mosquitoes test positive for Zika in South Beach as local cases rise	1-Sep-16	JOEY FLECHAS and DANIEL CHANG
30	New Zika zone identified in Miami's Little River area, with five cases reported	13-Oct-16	DANIEL CHANG and DAVID SMILEY
31	Second possible local Zika infection reported in South Florida	21-Jul-16	DANIEL CHANG
32	Travel ruled out in Florida's two suspected cases of local Zika infection	26-Jul-16	DANIEL CHANG
33	Zika on South Beach? Locals and tourists shrug it off	21-Aug-16	ALEX HARRIS and JOEY FLECHAS
34	Zika takes bite out of Miami-Dade economy — how bad will it get?	19-Sep-16	CHABELI HERRERA, NANCY DAHLBERG and NICHOLAS NEHAMAS
35	Zika toll rises with more Florida infections	11-Aug-16	JENNY STALETOVICH
36	Zika virus spreading in Miami as new local case reported outside of Wynwood	2-Aug-16	DANIEL CHANG, ALEX DAUGHERTY and JOEY FLECHAS
37	Zika virus will 'become endemic,' CDC leader says	25-Oct-16	DANIEL CHANG
38	Zika zone triples in Miami Beach after more cases found	16-Sep-16	JOEY FLECHAS and DOUGLAS HANKS
	<b><u>Headlines of Dallas Morning News Articles</u></b>	<b><u>Date</u></b>	<b><u>Author</u></b>
39	Alarm rising over spread of Zika virus	Jan-16	WAYNE CARTER
40	As Zika threat looms, Senate moves to fund response	May-17	KATIE LESLIE
41	Brazil promises action in fight against Zika	Feb-16	
42	Carrollton man with Zika is Denton County's 2nd confirmed case	6-May-16	BRUCE TAMASO
43	Congress averts government shutdown, approves \$1.1B Zika relief	28-Sep-16	KATIE LESLIE and JAMIE LOVEGROVE
44	Dallas resident tests positive for Zika in Dallas County's 12th confirmed case	5-Jul-16	CLAIRE CARDONA
45	Debunked: Are genetically modified mosquitoes spreading Zika?	27-Jun-16	SEEMA YASMIN
46	Fifth Zika case reported in Tarrant County	11-Jun-16	CHRIS SIRON
47	First Texas baby born with birth defect linked to Zika	13-Jul-16	SEEMA YASMIN
48	How is Texas responding to Zika threat? Medical experts to discuss virus at May hearing	Apr-16	BRITTNEY MARTIN
49	How the Zika virus inspired a Design District Gallery founder	28-Jan-17	MICHAEL GRANBERRY
50	Puerto Rico reports first Zika-related death amid outbreak	Apr-16	LIZ FARMER
51	Texas Medicaid to cover mosquito repellent amid growing Zika fears	3-Aug-16	SABRIYA RICE
52	Texas Republicans pressure Obama for Zika funding	5-Aug-16	JAMIE LOVEGROVE
53	Woman in Rio Grande valley becomes Texas' first locally transmitted Zika case	28-Nov-16	NAOMI MARTIN
54	Zika concerns prompt warning for pregnant women living in, traveling to Brownsville	14-Dec-16	CLAIRE CARDONA



55	Zika confirmed to causes severe birth defects, CDC says	Apr-16	JULIETA CHIQUILLO
56	Zika flourishes in vagina, study finds	25-Aug-16	SEEMA YASMIN
57	Zika virus infect 13th Dallas County resident from Mexico	12-Jul-16	CALEB DOWNS
	<b><u>Headlines of Other Articles Analyzed</u></b>	<b><u>Date</u></b>	<b><u>Author</u></b>
58	A Bizarre New Zika Infection in Utah	18-Jul-16	ADRIENNE LAFRANCE
59	Is The Risk Of Catching Zika Greater In Poor Neighborhoods?	16-Jun-16	LULU GARCIA-NAVARRO
60	The First Documented Case of Zika Spread by Physical Contact	28-Sep-16	JULIE BECK
61	There's Probably Way More Zika in the United States Than Has Been Counted	3-Aug-16	ADRIENNE LAFRANCE
62	What Zika Researchers Can Learn From the Rubella Outbreak of 1964	6-Apr-16	ADRIENNE LAFRANCE

## Appendix B: Interview Questions

The questions I asked during my four interviews were variations of the following:

1. How do you address Zika in your work on a day-to-day basis?
2. What mosquito-transmitted diseases are you most concerned with?
3. What methods of vector control do you use?
4. What is your department's/organization's approach to combatting Zika?
5. Do you consider Wolbachia or genetically modified mosquitoes as an option in combatting Zika?
6. Have you received any negative feedback from the community about spraying?
7. What do you think are the greatest issues surrounding Zika in regards to public health?
8. What communities do you consider most at risk to Zika?
9. Do you think United States national and state policy concerning Zika is effectively addressing these concerns and communities?
10. If so, how?
11. If not, what/who is the policy not addressing and why do you think that is?
12. Do you think the media has been accurate and effective in portraying the threat of Zika?