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## How Misinformation and Mistrust Compound the Threat of Epidemics

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# How Misinformation and Mistrust Compound the Threat of Epidemics

William Stansel Boyd

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Research Assistant: Charles Fulton Gilliland

A thesis submitted in partial fulfillment of the requirements for completion of the  
Bachelor of Arts degree in International Studies  
Croft Institute for International Studies  
University of Mississippi

Oxford Mississippi

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## ACKNOWLEDGEMENTS

“And whatever you do, whether in word or deed, do it all in the name of the Lord Jesus, giving thanks to God the Father through him.”

Colossians 3:17

I would like to thank Dr. Kate Centellas for spending so much time with me on this project and for helping me develop it. I would also like to thank Dr. Dinius and Dr. Moses for their insight and their willingness to be on my thesis committee. Thank you also to my friends in our thesis group, I loved getting to share a little bit of life with all of you.

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Finally, I would like to thank my family and my friends for supporting me. I love you very much and hope to see you often in the years to come.

Peace and blessings to all of you.

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## **Abstract**

This thesis was conducted to study the effects of misinformation and medical mistrust on the public health field. I use the events of the Chapare Virus outbreak in Bolivia in the summer of 2019 and the public dialogue during that time period to discuss these themes. I used data from market surveys in La Paz, newspaper articles from *Página Siete*, and Tweets from the time period of the outbreak. My findings suggest that misinformation and medical mistrust affected public health measures, which has major implications for the way the public health field should address future public health events.

## **Chapter 1: Introduction**

Hemorrhagic fevers are enthralling; they are bloody, gory, gross, and terrifying. Each time one surfaces it becomes hard to not fixate upon. They are too ugly to look away, too scary to be avoided. Human beings are both intrigued and frightened of death at the core of our being. This duality is one of the many factors that leads into the social fixation on epidemics. When epidemics arise, the physical integrity of a society is at stake, but maybe even more frighteningly, the social psyche is put at risk. When a society is hit with an incurable, seemingly unvanquishable disease, society correspondingly begins to decompose. Just as the composition of physical bodies breaks down and begins to change as infected agents die, social bonds break down, decompose, and change, sometimes resulting in societal “death.”

Nothing has made the theme of epidemics more relevant to humanity in the present than the worldwide outbreak of the Coronavirus this year. Covid-19 has displayed the potential effects a virus can have on human society, local and international politics, and on the world economy. Not only are many people ailing or dying, but the global economy has grinded to a halt. Oil prices have plummeted, and companies that are considered unnecessary have closed their stores. Furthermore, in the United States President Donald Trump was recently cited giving a recommendation for people to ingest disinfectants to protect themselves from Covid-19, and the company “Miracle Mineral Solution,” or M.M.S., is a pseudoscience group that is trying to sell bleach products for that very same purpose (Eaten, M., et Al, 2020). Health officials and other politicians were quick to speak out against this recommendation, citing that ingesting disinfectants is unhealthy and will not protect civilians from the novel virus, and the FDA cracked down on M.M.S., creating short term injunctions that prohibit business (Eaten, M., et Al, 2020). However, these are short term solutions to a larger problem; when we need stability and consistency in the face of a pandemic, why are authorities so divided and why is the truth obscured?

In order to explore this question, this thesis investigates the Chapare Hemorrhagic Fever outbreak in La Paz, Bolivia, in 2019 and compares it to the reaction to Ebola in the United States in 2014. Why did people panic in both instances? Both cases were isolated, with rapid biosecurity<sup>1</sup> applied to the affected healthcare workers. The reality of the situation did not match the public reaction. What does that say about what is going on under the superficial plane of society; what key forces undergird societal interactions? I argue that by studying public

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<sup>1</sup> Biosecurity: according to the USDA, biosecurity is “everything that’s done to keep diseases and the pathogens that carry them – viruses, bacteria, fungi, parasites and other microorganisms – away from birds, property, and people.” (biosecurity, n.d.)



discourse through a variety of media one can see that misinformation and mistrust are key forces in shaping population behavior in the public health realm. Medical mistrust and misinformation cause societal breakdown.

## **Chapter 2: Background Information**

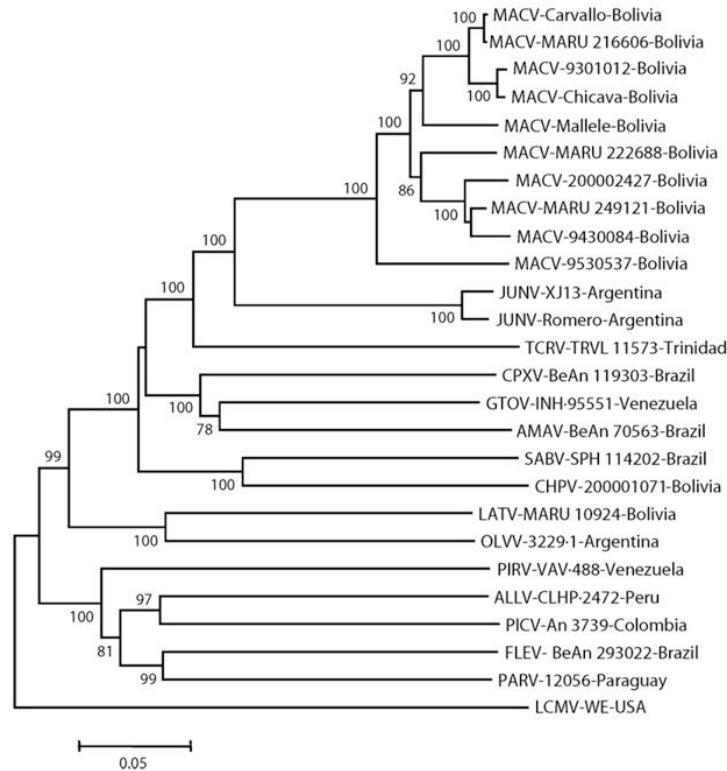
### **2.1 What is an Arenavirus?**

Arenaviruses are from the family *Arenaviridae* and genus *Arenavirus* that has 22 recognized viruses under this subcategory. The Chapare Virus is one of the newest 6 to be discovered. Chapare virus, as well as all the new world arenaviruses, form part of the Tacaribe serocomplex (Charrel et. Al, 2008, p. 362). Almost all the diseases in this group are spread by contact with rodents, with only one, the Tacaribe virus, being spread by contact with bats. The viruses most commonly known to produce hemorrhagic fevers are Sabia, Lassa, Junin, Machupo, and Guanarito. The symptoms and effects of these diseases include: high fever, headache, muscle and stomach cramps, and hemorrhage in the final phase of the disease.

Originally people believed the disease outbreak in Bolivia to be that of Bolivian Hemorrhagic Fever (BHF), which is spread by the Machupo virus. This is due to the outbreak in the 1960's of BHF in Bolivia which ravaged the country for around a decade, and then sporadically reappearing for the next 50 years with varying degrees of mortality and infection (Mackenzie, et. Al, 1964). However, analysis by the CDC in Atlanta in the summer of 2019 isolated the virus from the blood of one of the victims of the outbreak and labeled it as the second finding of the extremely rare Chapare Hemorrhagic Fever (CHHF), which only had one previous case in 2004 in the region of Cochabamba. Due to the rarity of the disease, it has not

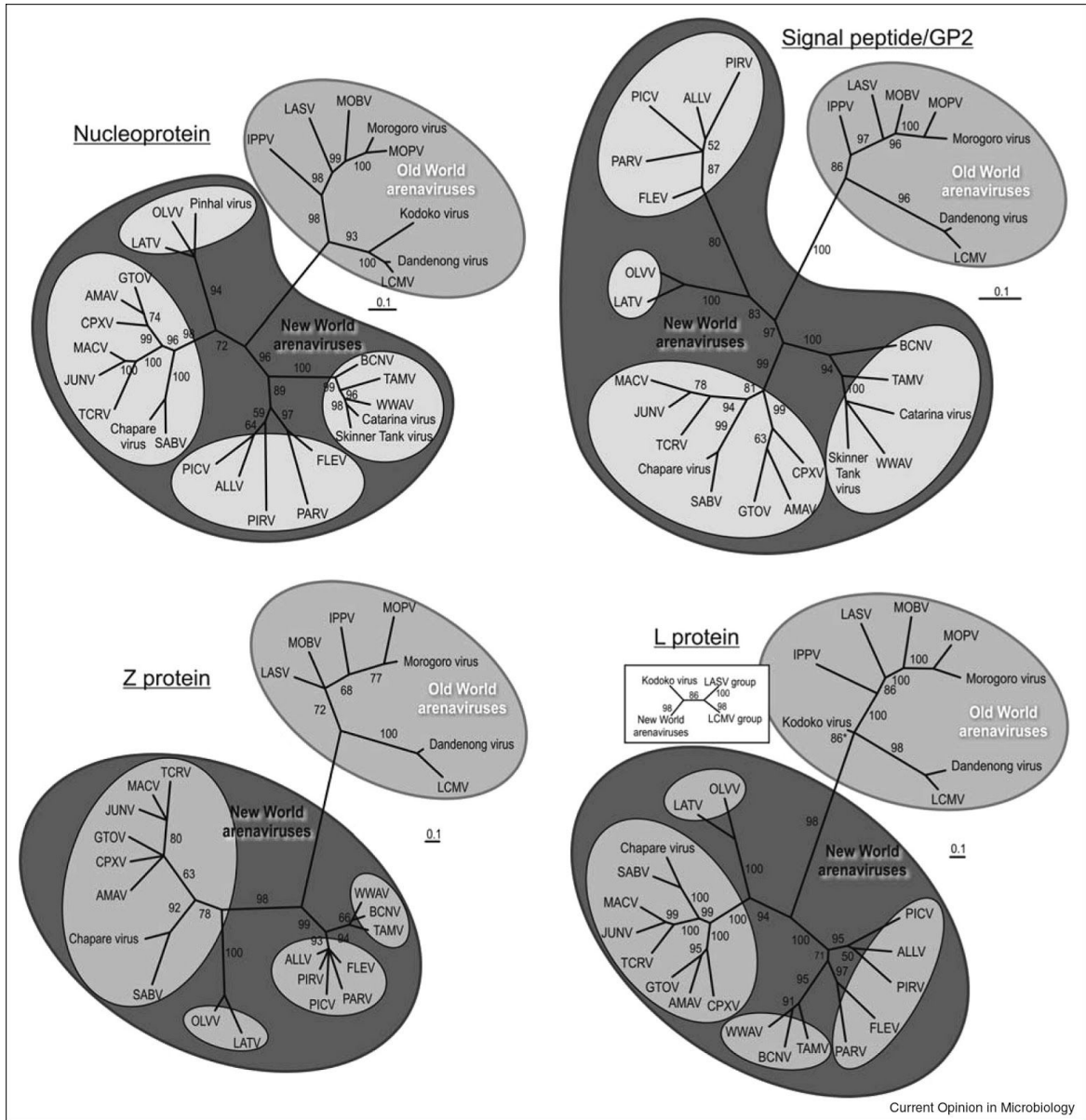
been studied extensively, and there is no known cure, though the drug Ribavirin can help in treatment.

A study chronicled the relationship between the new world arenaviruses (Cajimat, et. Al, 2009). The authors compiled a phylogenetic tree to display the results in order of how closely related they are to each other by comparison of nucleotide sequences.



The Machupo strains of the Bolivian Hemorrhagic Fever, which was the only hemorrhagic fever known to be native to the country until the more recent discovery of the Chapare virus, is grouped at the top of the table. The Chapare Virus, which many would assume to be closely related to the Machupo Virus, is actually linked very closely to the Sabia Virus of Brazil.

<sup>2</sup> A phylogenetic tree showing the genetic proximity between members of the family *Arenaviridae*. *CHPV* marks the Chapare Virus, with its closest relative coming from Brazil, the Sabia Virus (*SABV*). *MACV* is the Machupo Virus, which causes BHF



(Charrel et. Al, 2008, p. 364)

With this in mind it is safe to assume that the Chapare Virus shares many of the same traits that the Sabia virus has, which could be crucial to furthering the understanding of the disease, though there is relatively little known about the Sabia virus in comparison to other New World

<sup>3</sup> Diagrams representing genetic relationships between Arenaviruses based on different strands of proteins

arenavirus. This information is equally important for both the information it gives and the information it leaves to the imagination.

The profile of the virus as a hemorrhagic-fever-inducing agent means the Chapare virus is very dangerous to humans and can have grotesque effects on the human body. Signs and symptoms include fever, headache, joint and muscle pain, stomach pain, vomiting, diarrhea, and bleeding gums (CDC, 2019). Scientists do know that CHHF is not an airborne disease; it is spread only through contact with the excrement of rodents.

The lack of specificity of knowledge of the Chapare Virus and the potentially brutal effects of the disease explain the mystery and fear behind CHHF. There is no clearly defined profile for the disease or its closest relative, the Sabia virus. Scientists do not know the full extent of effects, contamination methods, and prevention methods for the disease, and no cure has been developed. So public hysteria in the face of a potential outbreak of CHHF makes logical sense; the reaction is a common result of the fear of the threat of the unknown.

## **2.2 Case Comparison: USA Ebola Crisis**

This outbreak reminded me of the Ebola outbreak in the US in 2014. The virus began in West Africa, killing thousands of people. It first arrived in the United States through two missionaries who flew in because they needed treatment. Around the same time a Liberian tourist, Thomas Eric Duncan, flew to Texas and ended up dying from the disease in Dallas. Dr. Martin Salia, a US resident treating patients in Sierra Leone, died from Ebola in Nebraska. Eleven people total were treated in the United States, with three fatalities (CDC, 2016). Of the four cases contracted in the US, only one was fatal.

These were relatively low numbers and isolated cases for the event to be called an outbreak. Much like the case in Bolivia, the majority of people were quarantined inside a medical treatment center, which left the disease quarantined from the general public.

In spite of the overall security of the public's health, what ensued in the US was hysteria; people predicted an outbreak similar to the ones seen in West African countries and news media outlets helped to whip the public into a frenzy. The outbreak was labeled "the Ebola crisis," a name that suggests a threat that is uncontrollable. This crisis did not happen, but the public attitude in the country stuck with me and resurfaced in my mind as I witnessed the public reaction to the hemorrhagic fever outbreak in Bolivia. Much like many United States citizens, the people in La Paz worried about biosecurity and were angry that the government was not protecting them, when in reality there were only a few cases of the disease before the outbreak was controlled. Neither outbreak came close to mirroring the numbers of deaths suffered in African countries from Ebola. I surmised there must be other forces at work underneath both public reactions. What was obvious was that there was a clear gap of trust between members of society and their institutions, and I began to ponder how that trust eroded. I also began to think about the potential threats this gap of trust could have on a society were it to face a truly potent, destructive epidemic.

I found an opinion poll dated October 2014 with some revelatory information. The authors found that many US citizens did not trust the official publicly distributed information on Ebola (Steelfisher et. Al, 2015). The survey reported percentages of people who displayed distrust in the following facets of Ebola information distribution: information from public health officials (20%), the CDC (17%), local hospitals (14%), and news outlets (15%).

A similar, nationally representative survey conducted in 2014 concluded that medical conspiracy theories are widely believed and spread (Oliver, J. E., & Wood, T., 2014). Survey results showed that around 50% of adults in the United States agreed with at least one of the six medical conspiracy theories listed, the most noteworthy being that the CIA deliberately infected Black Americans with HIV, and that vaccines cause autism and other psychological disorders. Around 20% agreed with three or more of the theories. These results provide compelling evidence that medical mistrust was present during the Ebola crisis, though some could argue that “lack of education” and “ignorance” could be two other variables that might also cause the belief in medical conspiracy theories.

Another survey on the American Public showed the common US public opinions on Ebola. The author starts the article by referencing an amazing statistic: even though there were only two cases of Ebola at the time the disease was listed as a top 3 health crisis (Steelfisher et. Al, 2015). With data from October 8-14 the authors displayed the list of responses in a graphic included on page 8. Interestingly enough, the majority of respondents claimed to not fully trust the information being disseminated about Ebola, with the data seeming to conclude that the American public viewed the information dissemination about Ebola to be neither perfectly trustworthy but not entirely untrustworthy. This is further shown in the results of question number 3, for example, where the majority of the American public believed that Ebola could be caught by being sneezed on, when in reality the disease was known to not be airborne. This study seemed to study the Ebola crisis in the same way I wanted to study CHHF; the authors’ questionnaire mirrored the Bolivia Field School market survey and their findings resembled what I expected to find through my own research.

The U.S. Public's Attitudes, Beliefs, and Knowledge about Ebola.\*

Question	Percent of Respondents
I'm going to read a list of some ways people can get a disease. As I read each one, please tell me how likely you think it is a person could get Ebola that way.	
Coming into contact with bodily fluids, including blood or vomit, of someone who has Ebola and shows symptoms	
Very likely	86
Somewhat likely	9
Not very likely	2
Not at all likely	1
Touching objects or surfaces that have been in contact with bodily fluids of someone who has Ebola and shows symptoms	
Very likely	59
Somewhat likely	28
Not very likely	6
Not at all likely	4
Being sneezed or coughed on by someone who has Ebola and shows symptoms	
Very likely	59
Somewhat likely	26
Not very likely	9
Not at all likely	3
As far as you know, if a person is infected with Ebola, can they transmit the disease to others before they are showing symptoms, or can they only transmit the disease once they are showing symptoms of Ebola?	
Before they show symptoms	48
Only once they show symptoms	36
Don't know or refused to answer	16
How much do you trust public health officials in the United States to share complete and accurate information about the Ebola virus?	
A great deal	7
A fair amount	24
Just some	25
Not too much	23
Not at all	20
How much do you trust information about the current Ebola outbreak that comes from . . .	
the Centers for Disease Control and Prevention, the CDC?	
A lot	22
Some	36
Not too much	23
Not at all	17
local hospitals and health authorities?	
A lot	22
Some	40
Not too much	22
Not at all	14
news organizations covering Ebola?	
A lot	19
Some	38
Not too much	26
Not at all	15

\* Data are from a Harvard T.H. Chan School of Public Health and SSRS poll, October 8–12, 2014; a Kaiser Family Foundation poll, October 8–14, 2014; an Associated Press-GfK poll, October 16–20, 2014; and a Pew Research Center poll, October 16–19, 2014. “Don't know,” “Refused,” or “No answer” responses are not shown where the percent of respondents was less than 5. (For a list of referenced polls, see the Supplementary Appendix.)

These surveys helped me hone in on one of the most likely causes of this community distrust and medical mistrust. Surveys reporting false beliefs and conspiracy theories most likely mean one thing: “fake news.” I then searched for a more academic term and found a body of work on “misinformation,” defined as false beliefs (O’Connor, C., & Weatherall, J. O., 2019).

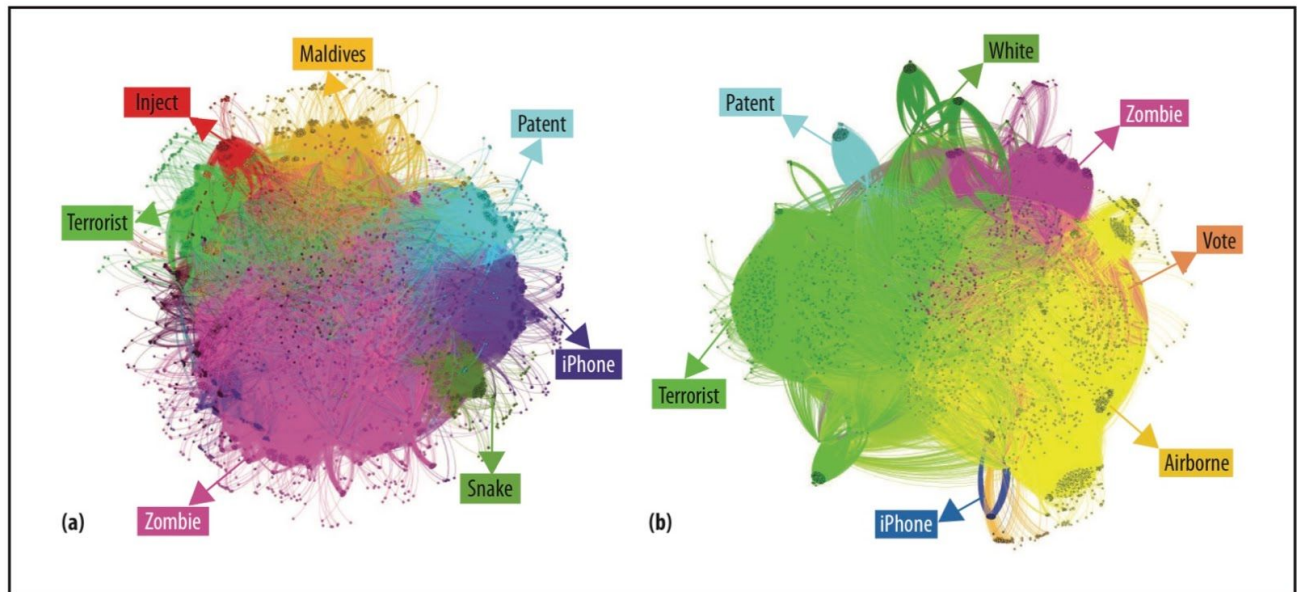
Subsequently I searched for studies related to Ebola and misinformation, and then I found a study which I used to model my study, titled “Misinformation Propagation in the Age of Twitter.” The authors studied Ebola-related rumors on Twitter in the United States during the Ebola crisis, and their findings supported the notion that there existed a culture of misinformation and mistrust in the American public during the 2014 US Ebola crisis (Jin, F, et al. 2014). These results were generated by gathering tweets from late September of 2014 through late October of 2014, by employing common hashtags. After scraping the tweets from Twitter under the hashtags, the authors then categorized the responses, removing the search terms and searching for rumor buzzwords. After finding different rumors these tweets were categorized and labeled based on the theme of each tweet.

<b>Table 1. Top 10 Ebola-related rumors by Tweet volume from 28 September to 18 October 2014.</b>		
<b>Rumor no.</b>	<b>Content</b>	<b>Label</b>
1	Ebola vaccine only works on white people	White
2	Ebola patients have risen from the dead	Zombie
3	Ebola could be airborne in some cases	Airborne
4	Health officials might inject Ebola patients with lethal substances	Inject
5	There will be no 2016 election and complete anarchy	Vote
6	The US government owns a patent on the Ebola virus	Patent
7	Terrorists will purposely contract Ebola and spread it around	Terrorist
8	The new iPhone 6 is infecting people with Ebola	iPhone
9	There is a suspected Ebola case in Kansas City	Kansas
10	Ebola has been detected in hair extensions	Hair

The Tweets were then placed in a colored diagram to represent each rumor’s frequency during



the two different ends of the data collection period. (For example, there were more zombie related rumors circulating during time period (a), on the left, than time period (b), on the right, as seen by the larger cluster of purple on the (a) side)



**Figure 1.** Clustering of Ebola-related rumors on (a) 29 September 2014 and (b) 6 October 2014. Rumors are color-coded consistently across the two projections.

The study concludes that based upon the analysis of the tweets, more likely than not the American public opinion on Ebola was affected by these rumors. After mulling over and dissecting “Misinformation Propagation in the Age of Twitter,” I decided it would be the perfect starting template for my work on the CHHF outbreak in Bolivia.

### Chapter 3: Methodology

The data for this project comes from three sources. The first are the results from a market survey in La Paz, Bolivia conducted July 2019. The second source are news articles from three of the Bolivian news outlet *Página Siete*. The third are results from twitter data mining.

### **3.1 Market Survey**

My first personal interaction with the epidemic was helping to interview participants in a market survey with a research group I was a part of this summer in La Paz, Bolivia. We conducted a survey of female market workers, *caceritas*, and their experiences with the Bolivian healthcare system. We divided into five groups and went to different markets across the city; Achumani, Camacho, Los Pinos, Obrajes, and Sopocachi. We asked a script of questions provided to us by Doctor Kate McGurn Centellas and Doctor Miguel Centellas on a clipboard, and recorded the answers on the paper we had. We had IRB approval forms and information slips available should anyone have requested them.

### **3.2 News Articles**

I used articles from the time period of the outbreak from *Página Siete*, a Bolivian news media outlet. There exist some limitations to using only one media outlet for data collection; however, I believe my choice is justified. I selected this news outlet for a number of reasons, but primarily because *Página Siete* is very centrist in its bias in comparison to many other popular news media outlets. Their website archive is easy to navigate; I was able to filter articles by keyword and also see them in order of date from newest to oldest. *Página Siete* is very good at staying up to date on their information, and posts multiple times per day on specific events, such as the arenavirus outbreak, which makes this newspaper the perfect vehicle to see what people were saying and how what they were saying changed in a matter of days or sometimes even hours. I collected a total of 89 articles from the *Página Siete* website under the search query “arenavirus,” which yielded 121 results.

### **3.3 Twitter**

To give further weight to my data collection I also scraped Twitter with the help of my research assistant, Charlie Gilliland, who studies in the computer science department. Due to his skills in coding and his ability to request the use of the twitter database through the computer science department, he offered to write me a program that would scrape Twitter for tweets that had my search terms, while also eliminating retweets so as to not mess up the collection (this did not eliminate us from seeing how many retweets a tweet had, it prevented the program from counting each retweet as its own tweet).

We did a preliminary, limited scrape for free with a broader list of search terms. We received back a large number of tweets and maxed out at the available requests through the trial. However, almost all of this data was unuseable; there were many references to an Argentine hemorrhagic fever and many tweets that contained other viruses. I had made the search terms too broad. From this we learned we would need to be more specific with our search terms, given that there was no adequate way to limit our geographic area to only Tweets from Bolivia because most people do not use the geotag feature.

I then wrote out the final Twitter search terms. We made sure to only allow Spanish tweets at first, but then added in English results later when we realized we had a lot more requests available. We decided on the following list: arenavirus, chapare virus, paro médico, CHHF. The time frame was June 25 through August 25, 2019.

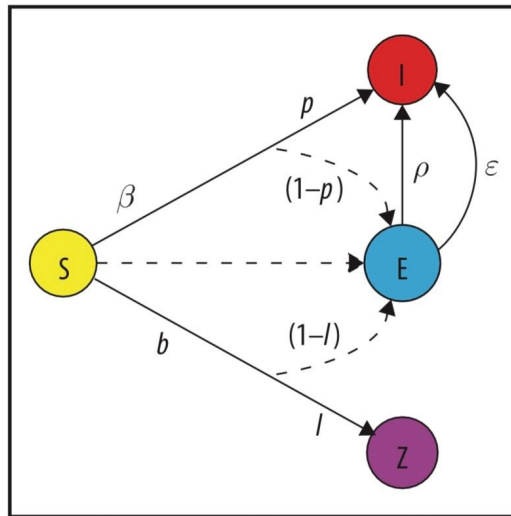
## **Chapter 4: Theoretical Framework**

## 4.1 Misinformation

There are three main theories used in this study, the first of which is Misinformation. Misinformation is defined as false beliefs (O'Connor, C., & Weatherall, J. O., 2019). O'Connor and Weatherall wrote a book titled *The Misinformation Age* that discusses how misinformation spreads in present times. The book seeks to define truth, the perpetuation of falsehood, conformity, evangelization, and social grouping. The authors ask why false beliefs persist and spread in the face of terrible, sometimes fatal consequences for the people who believe them. They assert that instead of individual physiology, social factors are the most important way to analyze and understand the spread of false beliefs, which helped me choose how to and what to collect for data. The book is written in response to the political buzz term “fake news,” and aims to help people fight misinformation spreading, making it the perfect work to base my theoretical framework upon. They conclude the book by proposing that we attempt to redefine democracy, because it is apparent that the current institutions defending democracy do not prevent the masses from becoming manipulated and controlled.

Nizamani, Memon, and Galam wrote a study on public outrage leading to public violence through an “epidemic-like” model that helped me conceptualize misinformation as an abiotic pathogen (Nizamani, S., Memon, N., & Galam, S., 2014). The article discusses epidemic spread models, and begins by equating the spreading of illnesses to the spreading of minority opinions. In this article the authors use a frame of differential equations with continuous variables to study the spread of hatred within a subset of a diverse population, specifically focusing on the conditions that cause the jump from public outrage to public violence. Even though Bolivia did

not experience bursts of outrage during the CHHF outbreak, I felt that there were many similarities between this study and mine. They focused on the delayed reaction of outrage; an action happens in one part of the world, and then a public reaction in another part of the world takes place due to that incident. They propose a model with two states; being upset by the event and then turning violent to extract vengeance. I gathered that were I to study this theory, it would help me understand misinformation spreading; to me this study looked at the potential escalation of the conditions present in my study. Misinformation spreading follows the same pattern as the public violence model, while probably occurring a few steps before the public violence model would take effect. In this work Nizamani, Memon, and Galam refer to the Daley and Kendall rumor spreading model, called the SIR model, as a basis for their own model. The SIR acronym stands for; S, number of individuals aware of the rumor and willing to spread it, I, individuals ignorant about the rumor and susceptible to it, and R, individuals who know about the rumor but do not want to spread it. The model proposes that when S meets I, I becomes an S. If an S meets another S or an R, then the S becomes an R. This was intriguing for me because this rumor spreading model provided a perfect scientific conceptualization of misinformation spreading. The authors then expound upon a few different variations of the SIR model, the following of which was created for twitter information spreading (Twitter data is used in this thesis):



**Figure 2. SEIZ compartmental model applied to information propagation on Twitter: susceptible (S), exposed (E), infected (I), and skeptical (Z) users.**

(Nizamani, S., Memon, N., & Galam, S., 2014)

For the proposed model of the authors, however, there are five components. There are sensitive persons who are unaware of the issue and are issue-sensitive. There are upset persons who are aware of the issue, spread knowledge of it, but do not act upon the issue. There are immune agents who have their opinion and are not upset by the incident, but may upset the upset persons. There are violent persons who are involved in violent actions that are in response to the issue. Finally, there are the relaxed individuals who become relaxed after staying upset and violent for some time from the actions of the upset and violent persons. They then contend that epidemics are similar to hatred in the sense that when one infectious agent contaminates another, the disease spreads, but only susceptible agents are able to contract the disease. In the very same way, rumor spreading can function as an epidemic. A spreading process occurs, which can either create a huge infection or die out once the rumor ceases to find new minds to populate.

According to the findings of the study, violent reactions to an issue create upset and violent sentiments at first, which then vanish with time. This usually happens with misinformation as well; over the course of time, factual information disproves or debunks commonly believed misinformation.

#### **4.2 Community Distrust and Medical Mistrust**

The other two primary themes of this thesis are community distrust and medical mistrust. Community distrust is when members of a community do not trust the governmental or societal institutions present in their community. In fact, community distrust may be the first sign that a society is decaying; in the same way that community trust forms the bonds of society, community distrust breaks them down. Medical mistrust is a very specific facet of community distrust; medical mistrust is when members of a community do not trust the medical institutions or authorities present in that community. For example, Cohn and Kutalek published a study where they found that both Ebola and Cholera revealed community distrust and social violence (Cohn, S., & Kutalek, R., 2016). The purpose of the article is to explore how epidemics affect society and reveal undergirding rifts in social relationships. This article was very helpful in shaping my understanding of the CHHF outbreak in Bolivia. The authors propose that under the stress of epidemics communities that respond in violence have deep seated distrust between local communities, local populations, government agencies, and outside agencies. This distrust is *exposed* through the violent outbursts against the different groups efforts to respond to the epidemic crises, though not created by the violence. For example, in Guinea the urban youth attacked what was a recently constructed ebola clinic because they either believed ebola did not

exist or that it was spread by outsiders. As shocking as it may sound, this attack was far from uncommon during the ebola crisis; in the last six months of 2014 the Red Cross was attacked an average of 10 times a month in Guinea. The epidemic exacerbated the underlying mistrust of both societal and medical institutions, and violence resulted. Doctors, politicians, and journalists were killed. People were quoted to have declared ebola a lie or asserted that if people went to the hospital they went to die. Many of these rioters viewed themselves as defenders of their communities against the supposed state-led poisoning of their country. There is a striking similarity between the violence against ebola health responders and the cholera health responders. In the 1830's, during the first pan-European cholera epidemic, riots spread across the continent and even further to cities in North and South America. Physicians, surgeons, pharmacists and nurses were murdered and hospitals and medical centers were destroyed. These same actions were carried out by very different people and vastly different cultures at the same time. The common ties between all of these events were the conspiracies surrounding cholera, mistrust, and the targets of violence, with no communication between the different groups of people. This lack of communication between different levels of the population was incredibly damaging; misinformation and mistrust make it impossible for a society to wholly trust any form of authority, leaving public health officials at the whim of public frenzy. After reading these anecdotes, I realized that though the CHHF outbreak in Bolivia was special, it was not unique. Rather, the manifestation of this newest arenavirus created an event in Bolivia that fit a larger pattern present throughout world history, a pattern that is timeless and worth studying.

Earnshaw, Bogart, Klompas, and Katz wrote an article on medical mistrust under the context of Ebola that gave me the base idea for my study (Earnshaw, et. Al, 2016). They believe



that public reactions to diseases may be affected by medical mistrust. They define medical mistrust as the suspicion of and lack of confidence in medical organizations and providers. They reference an analysis of tweets from late September and mid-October 2014 suggesting that Ebola conspiracy theories were widely spread through the social network. A commonly cited twitter theory was that Ebola vaccines only worked on white people and health officials injected Ebola victims with lethal chemicals. They explored the potential public health effects of medical mistrust, specifically focusing on conspiracy theories, in the context of the 2014 Ebola outbreak in the United States. The authors conclude from the results of their investigation that some of the US public reaction to Ebola may have been defined by fear, mistrust, and conspiracy theories. They recommend that public health and other officials take seriously the threat of conspiracy theory spread for future infectious disease outbreaks. This study encouraged me to continue the academic discourse on this topic of misinformation through the vehicle of Twitter.

#### **4.3 Theories Specific to Hemorrhagic Fevers in Bolivia**

Meerburg, Singleton, and Kijlstra wrote an article on Rodent-borne diseases and their risks for public health (Meerburg, et. Al, 2009). This resource is valuable for understanding the multifaceted nature of viruses like CHHF. While recognizing the age-long history of rodents and contagious diseases going back to at least the Middle Ages, the authors choose to focus on the modern threat of rodents. They discuss modern pathogens and a simplified rodent disease model. The purpose of the article is to review and help further the understanding of rodents, rodent reservoirs, and disease risks that have to do with rodents. Rodentia is the most abundant mammalian order, representing 43% of the species. They are present on every continent except

for Antarctica, which means that as long as rodents are populous, humans will always face sicknesses like CHHF and Ebola. There are both direct and indirect pathways for rodents to transmit diseases to humans. The direct route is direct contact with human beings, which includes biting, physical contact, contact with rodent feces, or contact with food contaminated by rodent feces. Humans can come into contact with water contaminated by rodent urine or breath in germs that are present in rodent excrement. Rodent-borne diseases can also be spread indirectly by serving as amplifying hosts of pathogens. For example, rodents who are vectors can be ingested by livestock or accidentally processed in livestock meat-processing plants and then be later consumed by humans. Rodents can also become infested with ticks, mites, or fleas that can also subsequently infest humans. Hemorrhagic fevers are one of many pathogens that can be spread through rodents, and four of the five South American hemorrhagic arenaviruses are spread through a primary rodent reservoir. This study by Meerburg, Singleton, and Kijlstra helped me understand the timeless nature of these viruses.

Ann Zulawski wrote *Unequal Cures* about public health in Bolivia during the first half of the twentieth century (Zulawski, A., 2007). Though a work on an older epoch in Bolivian history, this study is valuable in recognizing the nuances of the history of the Bolivian public health field and how it is similar to and different from other countries around the globe. This work tells the story of how Bolivian society struggled and dealt with public health issues during an especially problematic epoch; during this time period Bolivians faced malaria, yellow fever, yaws, hookworm, whooping cough, typhus, typhoid, TB, small-pox, venereal disease, silicosis, and illnesses associated with contaminated drinking water. Simply put there is no better time period for which to study Bolivia from a public health perspective. Bolivia had a very diverse

population that doubled during the first half of the twentieth century, and the geographic diversity of the country allowed for the prevalence of many different types of diseases. To make matters worse, Bolivia is a poor country, affecting the overall psychosis of the nation from a medical perspective; people cannot always rely on western medicine and sometimes resort to alternative healers or ancient traditions for cure. The book sets out to describe the health problems present during the time period, the social and economic causes of those problems, and the responses to those problems. Zulawski asserts that the story of public health and political change in Bolivia is defined by housing and working conditions, the effects of political and armed conflict, and the organization and mobilization of social groups to improve health in Bolivia. I saw this firsthand when I lived with my host family in Bolivia; both the father and the eldest son were involved in an educational union demonstration to protest a recent educational conflict. The first theme she discusses in the book is hygiene and being Indian; she explores how ethnicity shaped the lives and health outcomes of Bolivians during the time period. This is a theme that Bolivians still struggle to navigate and manage in the present day. Specifically she mentions the fearful relationship between the elite and the Indians; the elite believed the Indians were more diseased bodies that were dangerous to come into contact with. This created a rift between the two groups as urbanization began and the two groups began to come into contact more often. This was a clear example of community distrust dating back to around a century from when I collected my data. The fear of the indigenous was sometimes assuaged and sometimes promulgated by doctors, creating medical mistrust between indigenous populations and healthcare providers. *Indigenismo*<sup>4</sup> promoted polarity between the *mestizo*<sup>5</sup> groups, the

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<sup>4</sup> *Indigenismo*: word referring to a glorification and idealization of the indigenous (Zulawski, A., 2007)

<sup>5</sup> *Mestizo*: literally translates to “mixed” from Spanish, refers to mixed race ethnic groups (Zulawski, A., 2007)

whites and the Indians. As the Indians became increasingly more and more proud of their heritage, the overall social polarity increased, leading to community distrust on an even larger scale. This meant that some social groups relied on doctors for cures, and others relied on Andean remedies, leaving no objective, official medical authority for society. My conclusions mirror some of Zulawski's findings, normalizing them in the present day Bolivian context and at the same time echoing similar concerns that should be raised in the present.

One more angle to study community distrust and medical mistrust is to delve into the theory of envy<sup>6</sup>. In 2013 Higgs wrote a dissertation on the politics of envy by looking at a community of Bolivian Immigrants in Escobar, Argentina. He argues that when forming a Bolivian community in Argentina, the undergirding values of normal Bolivian society were carried over and subsequently exposed. In chapter 5 he argues that envy has always affected Bolivian solidarity. In fact, he asserts that most of the Bolivian residents in the *barrio*<sup>7</sup> agree that *envidia*<sup>8</sup> is one of the defining characteristics of being Bolivian. He paints a picture of a “matrix of envy.” He more specifically defines envy as a desire to rectify being left behind because of another's progress. This envy also comes with a component of shame. In terms of consequences of envy, he expounds upon the cutting of social fellowship, the creation of otherness, which lead to exclusivity, differentiation, and competition. One of the most common effects of envy is social avoidance. In many ways Higgs was describing community distrust and medical mistrust, without using either term explicitly. Envy is an integral part of both community distrust and medical mistrust; envy leads to people ceasing to recognize the humanity of their fellow man and simply began to see them as others. Envy leads to othering, which is a distancing of one person

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<sup>6</sup> Envy: wanting to have what someone else possesses

<sup>7</sup> *Barrio*: neighborhood

<sup>8</sup> *Envidia*: envy

or a group of people from another person or group of people. In other words, envy leads to social decay. Finally, Higgs argues that complex, “isolated” acts of envy are actually parts of cycles of envy. The implications of cyclical envy are astounding; if envy (and therefore community distrust and medical mistrust) occurs cyclically, then work must be done to combat envy in order to preserve the functions of society.

## **Chapter 5: Data Analysis**

Findings from the study on Ebola in the US suggest that misinformation and rumor spreading affected society’s perception of reality. The data suggests that community distrust and medical mistrust were present in the rumors promulgated through Twitter (Jin, F, et al. 2014). Furthermore, the preliminary analysis of the data from the market surveys from the groups on my trip to Bolivia suggested both medical and communal mistrust. So after collecting my data sources, I began to analyze the data based on inspiration from the methodology of the Ebola study (Jin, F, et al. 2014) while looking for some of the themes I found in the preliminary analysis of the market survey as well as the indicators I was searching for, being namely misinformation and medical mistrust.

### **5.1 Survey Results**

My survey subgroup consisted of myself, Olivia Jaramillo, Claire Haxton, and Dr. Kate Centellas. We went to El Mercado Camacho and primarily interviewed store owners at the market. This market is part of a newer development in the center of the city and would be considered a large market not a small, neighborhood market. We had a response rate of 20 out of 26, which was very successful. Out of our respondents two were men, and the rest women. The

ages ranged from 22 to 89, with a median age of 46 and an average age of 48. When we asked our respondents about the major health crises in Bolivia, few mentioned the recent arenavirus outbreak (though I spoke with two women from different parts of Mercado Camacho who listed it as a pressing problem). The more interesting trend from the survey, however, and how it relates to my study, is what the respondents had to say about the overall health system. Out of a total of 86 respondents from all five markets, 41 of people responded negatively to the last and optional question of the survey, which was an open ended question. That is to say that 47% of respondents responded to an optional question in a way that displayed distrust of healthcare providers in Bolivia. This does not include everyone who spoke negatively about the medical system, which trended closer to the upper 80 to 90 percent of respondents. These conversations piqued my interest because they exposed the underlying distrust between this working class subset and the medical system in Bolivia. Many respondents in our group seemed to treat our interview process as a personal therapy session; most women responded to our survey with horrific personal anecdotes of tragedies faced at the hands of the public hospitals. This was enriching for me because I knew that there was a deep, painful truth lying behind the curtain of normalcy. I was intrigued more and more as the different respondents seemed to respond with parallel histories, and I began to develop an empathy for their plight that only furthered my desire to investigate it.

Some answers to this optional question specifically drove me to explore the distrust between the Bolivian healthcare providers and citizens. One woman said that the country needs more third level hospitals because the people are dying. This was a commonly repeated assertion: many people said that if a citizen did not have a lot of money or social class, then they

would wait for hours and potentially die. Another woman, who appeared mid to late forties, was hesitant to answer our survey at first and then opened up, pouring out more and more of her story when she realized we were genuinely interested in learning about what she and her family had been through. Her husband sat quietly without interjecting and let her vent. She told us that her brother went into the emergency room for a life-threatening injury, and did not have very long left to live. Instead of receiving the care he needed at within a reasonable time slot, they waited for four hours. No one came to care for him, and she watched him die on the waiting table in front of her with her very own eyes. This was the most powerful personal anecdote that I heard from my group that went to el Mercado Camacho, but many of the women we interviewed in the same market said similar things. One refused to answer our survey but yelled out “you go to the hospital to die” as we walked away. The emotional weight of this entire experience hit me in a way no article or paper could have; I shared the emotional burden and trauma with these Bolivian women for just a few minutes of our lives together. This led me to further desire to understand the interesting connection between the controlled epidemic and the public response to the arenavirus; I was beginning to understand why people did not trust the medical system, because I myself had begun to feel skeptical about it as well.

## **5.2 News Articles**

I hypothesized that the analysis from the collection of my news articles would suggest that specific rumors were spread during the time period by Bolivian news media sources, and more specifically, *Página Siete*.

I used all the articles from the 2nd of June to the 1st of August. I chose the first date because the 2nd of June marks the first article published under the search query. While not labeled “arenavirus”, the article mentions the “unknown virus” that had just had three more suspected cases. One day later, officials released to the press that the infectious agent was in fact an arenavirus. I chose the last date because there was an eleven day gap between the articles on August 1 and August 13, which meant the topic had lost its popularity label (up until that point *Página Siete* published one or two articles on the topic per day, with maybe one day breaks in between). I also justified not using articles past August 1 because many of the articles towards the end of that time frame began to reference the “arenavirus” in a more casual, historical way, indicating that the population was no longer in fear of contagion.

I read each article individually, labeling them into three categories: *desconfianza*<sup>9</sup>, *desinformación*<sup>10</sup>, and *datos correctos*<sup>11</sup>. All of the articles under the *desconfianza* category also fall under the *datos correctos* category but were not counted in with them; I used the *datos correctos* category for articles that were factually sound and did not have anything to do with distrust or misinformation. Each article in the *desconfianza* category was factually sound without spreading misinformation, while exemplifying a clear theme of mistrust. The *desinformación* category was created to label articles that spread misinformation directly.

I then selected excerpts from specific articles that I believe best displayed the themes I was examining, and used other excerpts to showcase different article archetypes that were recurring throughout my research collection. Out of the 89 articles I collected from the *Página Siete* website, 34 (38%) mentioned medical mistrust and distrust in Bolivia. All articles except

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<sup>9</sup> *Desconfianza*: distrust

<sup>10</sup> *Desinformación*: misinformation

<sup>11</sup> *Datos Correctos*: factually sound



for one were factually correct, with the one promoting misinformation. There were also 9 articles (10%) which mentioned misinformation spreading. Each of these articles were usually avid in fighting the misinformation they discussed as well, citing factual information.

I found an article published on July 11, 2019 that effectively spread misinformation. Though the writer of the article does not write an account that promotes misinformation, one of the quotes in the article from the health official to the press does. Contextually, this article spoke of a public health worker union, SIRMES, and their desire for the Bolivian government to declare an epidemiological alert across the country, which the government had refused to do. The government decided not to raise the “alerta sanitaria” because they did not believe the reality of the situation merited the label. The quote from the article refutes the government’s stance:

*“Fernando Romero, secretario ejecutivo del Sirmes, indicó que si se hubiera declarado alerta sanitaria sólo se tendrían que ‘tomar medidas de seguridad’, como purificar el agua y hervir los alimentos que provengan del municipio de Caranavi, lugar donde se encuentra el roedor portador del virus. ‘Si hubiera alerta sanitaria habría una unidad que estuviera explicando todo el día que se deben tomar medidas de bioseguridad (...) y al no haber alerta sanitaria no hay quién se ocupe de eso. Es por eso que le reclamamos al Gobierno que sea responsable’, enfatizó Romero”*<sup>12</sup> (Arenavirus: Médicos reclaman que se declare alerta epidemiológica, 2019). In the article secretary Fernando Romero mentions that the country should implement the epidemiological alert so that the water is purified and so that the produce from Caranavi, the

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<sup>12</sup> Translated: *Fernando Romero, executive secretary of SIRMES, mentioned that if they had declared a sanitary alert they would only have had to ‘take measures of security’, such as purifying water and boiling produce that come from the region Caranavi, the place where the carrier rodent of the virus lives. ‘If there had been a sanitary alert there would have been a unit that would have been telling the people to take measures of biosecurity every day (...) and to not have created a sanitary alert means that there is no one to do that. And because of that we demand the government be responsible.*

region where the arenavirus broke out, would be boiled. While this seems like a reasonable idea in theory, the disease cannot be spread through eating of produce, and could only be spread should one consume rat feces or urine left on produce. Therefore, washing the produce, as one would do regularly, would be enough to prevent the disease from spreading. The same is true of the water purification, which would likewise be unnecessary.

There was a very insightful opinion piece published on July 14 titled “Lo que nos muestra el arenavirus” *{what the arenavirus shows us}*. This article speaks of the state of the opinion on public health in Bolivia during the CHHF outbreak: “*Aunque efectivamente, nada indica que haya una epidemia y es aconsejable la prudencia en estos casos, lo cierto es que poco eco han tenido en las autoridades los reclamos de los médicos y su preocupación por la situación del sistema de salud y la seguridad del personal que se desempeña en este sector*”<sup>13</sup> (Lo que nos muestra el Arenavirus, 2019). The Author goes further: “*Lo que ha hecho este virus es mostrarnos cuán improvisados somos en todo, especialmente en lo que requiere mayor cuidado, que es la salud. Los médicos no sólo son escasos sino que no pueden resolver solos una solicitud que los sobrepasa*”<sup>14</sup> (Lo que nos muestra el Arenavirus, 2019). This author believes that even if the Chapare virus was not really an epidemiological threat, the presence of the virus and the reaction to it by the government and health officials showed the many weaknesses of the Bolivian healthcare system and the lack of trust between the people and the government. This medical mistrust clearly had an effect on the public perception of the Chapare

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<sup>13</sup> *Translated: Although in effect nothing indicates that there is an epidemic and it is advisable to be prudent in those cases, the truth is that the doctors’ demands and preoccupation for the situation of the health system and healthcare personnel have had little effect on the authorities.*

<sup>14</sup> *Translated: what this virus has done is shown us how improvisational we are in everything, especially in what takes the most care, which is health. Doctors are not only scarce but also cannot solve a calling that supersedes them alone*

virus outbreak and also showed how fragile the reputation and effectiveness of the Bolivian healthcare system was.

There were a number of articles that mentioned fighting against misinformation spreading. The article “Gobernación realizará desratización en 5 municipios” published on July 9, 2019 mentions fighting against misinformation when the head of Epidemiology of Sedes (Department of Health Services) in La Paz, René Barrientos, was interviewed by the press: *“No hay ningún problema. El roedor (que transmite el Arenavirus) es de comportamiento salvaje; no es urbano o doméstico, por lo que no pudo haber contaminado ni a la población ni a la producción agrícola de ningún municipio”*<sup>15</sup> (Gobernación realizará..., 2019).

This article, published shortly before the statement by Fernando Romero, fights against the apparently popular belief that agricultural produce was contaminated with the Chapare virus and needed to be avoided. A previously published article from July 6 clearly spoke against this misinformation spreading; the title of the article in English is “Produce from Caranavi does not contain the arenavirus” (Larrea niega..., 2019). Another article interviewed the *Colegio Médico* gremlin president Luis Larrea, who refuted the public outcry in the region of *Yungas* based on a press release he and the *Colegio Médico* had previously given: *“Nosotros (como) Colegio Médico nunca hemos ido en contra de la localidad de Caranavi, es más, lo que hemos dicho es que esta alerta serviría para inyectarle recursos para lo que se requiera; esta es una alerta sanitaria, que no es lo mismo que un pánico ciudadano.”*<sup>16</sup> (Larrea niega..., 2019). Many of the

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<sup>15</sup> Translated: there is no problem. The rodent (that carries the arenavirus) is of the selvatic species; it is neither urban nor domestic, and therefore could not have contaminated the public or the agricultural produce of any municipality.

<sup>16</sup> Translated: We as a medical gremlin have never gone against the locality of Caranavi, and what is more, what we have said is that this alert will allow resources to be injected to the locality for whatever it might need; this is a sanitary alert, which is not the same as a citizen panic.

articles I researched referenced this original demand made by the *Colegio Médico*, which contradicted the calming messages the government was sending.

While president Larrea explained in this article that the *Colegio Médico* wanted this status for the economic access it provided, they did not believe the situation was worth worrying about. However, as shown by the article, the people took what the *Colegio Médico* said very literally, which created panic. This specific topic blurs the line between misinformation and truth, because the effect of the message was the same as the effect misinformation has on the public health opinions. As mentioned later in this thesis, the *Colegio Médico* rivals the government as the authority on public health matters, so the Bolivian population pays very close attention to what they say.

These findings from my research support my hypothesis that there was an atmosphere of medical mistrust and misinformation spreading in Bolivia during the Chapare virus outbreak, though the *Página Siete* itself was not a misinformation spreading agent. This is most likely due to the fact checking process done by *Página Siete* as they attempt to uphold the journalistic standard. Journalism, often more than other professional fields, must attempt to stay close as possible to reporting facts, because as soon as a news agency loses credibility their following diminishes in search of an organization that will tell something closer to the truth.

The findings from my research on the articles from *Página Siete* support the notion that misinformation spread affected the perception of the CHHF outbreak, though this misinformation was not directly spread through the news outlet itself as I had expected.

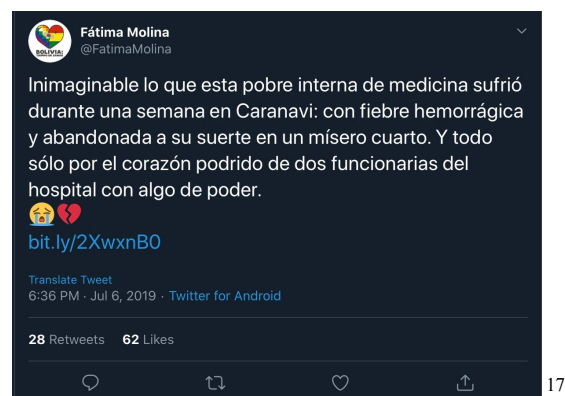
### **5.3 Tweets**

Charlie and I received more than 33,200 tweets in total from Twitter. Gilliland then categorized the tweets based on each search query so that we could weigh the validity of the data we had and process the information well. To limit our data set to a number more conducive to analysis, we set the following criteria for the tweets: tweets needed to have a minimum of 15 retweets and 15 favorites and retweets. We decided on the number 15 because we believed this number of retweets would ensure that the tweet was more likely than not shared amongst different social groups or at the very least different sub groups of a social circle. This means that each tweet would have the potential power to actually spread misinformation from one group of people to another. We also added the requisite for favorites because “favoriting” means that the twitter users more likely than not personally valued the tweet and the information it contained; the only practical values of favoriting a tweet are to archive it for personal use or to show public approval of the message of the tweet (Wilson, M. L., 2014). These two methods of interacting with a tweet are the only ways for users to place value on a tweet. While this did eliminate many options with only a lot of retweets or a lot of favorites, we believed it was important to have both minimums set at that number to ensure the quality and relevance of the data to our study. Finally, I went through the remaining 116 tweets and eliminated 23 that were not relevant to the topic and country, most of which talked about the Argentine hemorrhagic fever. After using these filters, the data set comprised 72 tweets in total.

I proceeded to read each tweet individually and mark it based on the three criteria I utilized for my article analysis: *desconfianza* (distrust), *desinformación* (misinformation), and *datos correctos* (factually sound). It is important to note that all of the tweets under the *desconfianza* category are also factually sound; I used *datos correctos* for tweets that were

factually sound and did not have anything to do with distrust or misinformation. Each tweet in the *desconfianza* category was factually sound without spreading misinformation. The *desinformación* category was created to label tweets that talked about or spread misinformation. Out of the 72 tweets analyzed, 43 contained information that hinted at or openly spoke of medical mistrust, and 28 were neutral in tone while sticking to the correct facts. After finding the percentages of the tweets in each category, I decided to shift into a more qualitative analysis of the data I had collected. I then hand selected a number of specific tweets that I had flagged in my research that related more strongly to the themes I discuss in this thesis, as well as tweets that were representative of the curated data set.

One of the themes discussed by many of the tweets was the first death caused by the Chapare Virus. Ximena Cuéllar was a medical intern at the hospital in Caranavi where the first case of arenavirus was located, and she contracted it due to her proximity to the patient. She passed away on July 4 in La Paz. Many people, including Ximena's mother, believed the government was culpable of mismanaging Ximena's treatment, which created a public debate as to what happened.



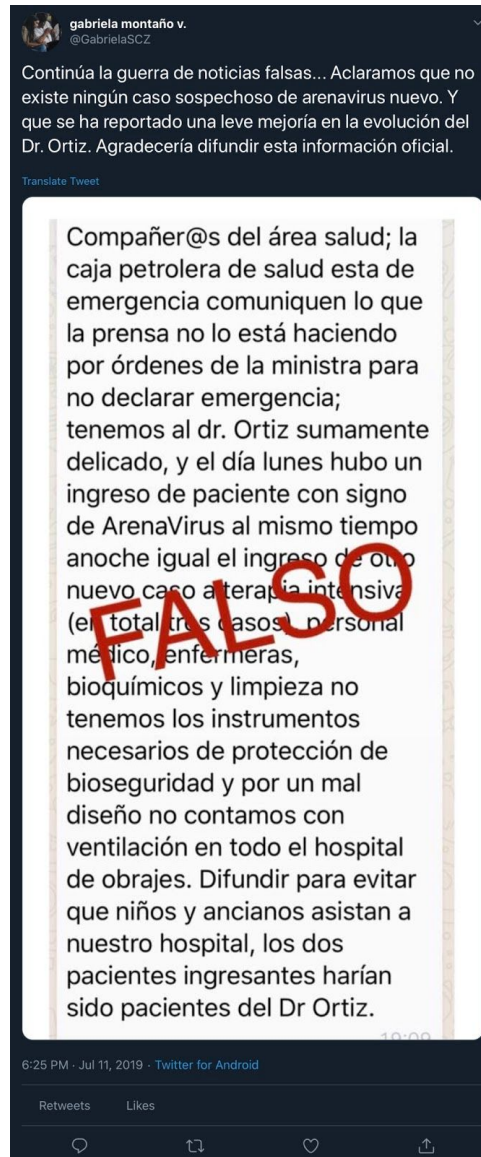
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<sup>17</sup> Translated: It is unimaginable what the poor medical intern suffered during one week in Caranavi: with a hemorrhagic fever and left her to her fate in a miserable room. All this because of the rotten hearts of the hospital staff in power.

Fátima Molina, a Bolivian twitter user, tweeted about the event and put a link to an article from *página siete* at the bottom of the text, an article which I came across in my earlier research of *Página Siete* (FatimaMolina, 2019). This tweet shows the public mistrust of hospital officials; Fátima, along with many of the people who liked her tweet (and most likely many people who read the article she referenced) appear to believe that the hospital does not take adequate care of patients. What makes the matter more complex is that there were two stories represented; the hospital claimed that Ximena wanted to keep working and though she was in good condition, while the mother of Ximena believed the hospital indirectly coerced her to keep working.

There was a tweet that mentioned a fight against misinformation that was being spread in Bolivia. The tweet, published July 11 by the Minister of Health, Dra. Gabriela Montaña, spoke against what she described as “fake news” (GabrielaSCZ, 2019). The tweet contains an image of a long text that, if you look at the light beige background with small symbols and the time stamp at the bottom of the text, appears to be something Dra. Montaña came across via WhatsApp (tweet included on page 34). This tweet is complex in nature, and requires further examination to unpack. The image that was spread seems to speak against the lies perpetrated by the health administration, while the tweet seems to denounce the image as misinformation. The truth is that Dr. Ortiz was recovering, and was eventually released from the hospital in November of 2019, and there were no new cases of arenavirus contracted at the time. What is clear from the tweet is that the physicians were at odds with the governmental healthcare system, making communication to the public difficult. The truth does not matter as much as the trust the public has for whoever claims to be telling the truth. Furthermore, the tweet directly stated that readers should copy and paste the information and spread it to their friends and followers in all their

social spheres, reaching the senior health official, which means that this was misinformation that was spread widely.



18 19

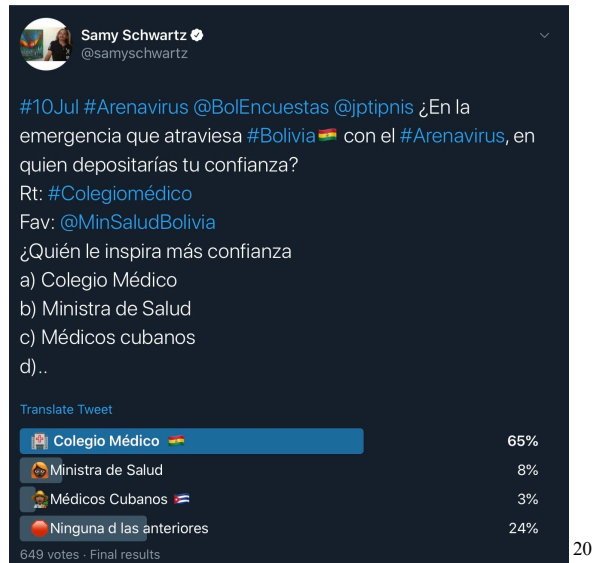
<sup>18</sup> Translated: the war against fake news continues... we clarify that there are no new suspected cases of arenavirus. And Dr. Ortiz has greatly improved. We would be grateful for you to share this official information.

<sup>19</sup> Translated: To our friends in the health field: the petrolera health clinic is in a state of emergency, and communicates that the press is not declaring emergency under orders of the ministry of health; Dr. Ortiz is in a delicate state, and Monday a patient was admitted with signs of arenavirus as well as another patient admitted to intensive treatment (three cases total), medical personnel, nurses, biochemists, and cleaning do not have the necessary tools or protection and by poor design we do not have ventilation in the obrajes hospital. Spread this so that kids and elderly patients will not visit our hospital, the two patients admitted have been patients of Dr. Ortiz.




Other tweets clearly discussed the atmosphere of medical mistrust in Bolivia at the time.

For example, Samy Schwartz, a *verified* twitter user, created a poll on medical trust during the CHHF outbreak (samyschwartz, 2019, July 10):



In addition to the criteria created through this twitter data scraping program which labels this tweet as important, this specific tweet has further value because of the user’s “verified” status. In the Twittersphere, “verified” means that the Twitter user has a popular following:

The blue verified badge  on Twitter lets people know that an account of public interest is authentic.

(About verified accounts, 2020)

*Colegio Médico* is a union of doctors in Bolivia, and according to the survey results, which boasted of 649 participants, the *Colegio Médico* won the trust vote in a landslide, with the runner up being an option for “none of the above.” The *Ministra de Salud (Bolivian Ministry of Health)*

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<sup>20</sup> Translated, clarified, no special characters: In the present Arenavirus emergency that affects Bolivia, who would you place your trust in? Retweet: medical gremlin. Favorite: Ministry of Health. Who evokes the most trust from you? A) medical gremlin, B) Ministry of Health C) Cuban Doctors D) None of the above

only received 8.2% of the vote. These results point to a disparity in the trust between the citizens of Bolivia and their governing authorities, which is important because many of the articles I collected ended with a paragraph about the actions of the *Colegio Médico* and how they acted against the information spread by the *Ministra de Salud*, meaning that my findings from this twitter scrape are complementary to my article analyses. This twitter poll is an indicator of the public pulse, which seems very much to be against the official healthcare system. This could help explain why there was so much hysteria around the arenavirus outbreak; with the doctors contradicting the government, the people would have a hard time choosing who to believe and would be wondering what was the reality of the situation. A few days earlier the same user posted another tweet spreading a message of mistrust (samyschwartz, 2019, July 6):



21 22

<sup>21</sup> Translated: The National Head of Epidemiology Jhemis Teddy Molina Gutierrez confirms that the transmit ability of the <<arenavirus>> is low and considered a non-threat to the population. 8 months ago he defended his thesis on Statistics, and what health is like in Bolivia, more of Evo Morales propaganda.

<sup>22</sup> Explanation: the picture shared on the top right is a picture of the graduate thesis, and on the bottom right is the text of the tweet but modified

The tweet references the head of Epidemiology's recently acquired doctoral status as granted under the Evo Morales administration. Evo Morales was the president of Bolivia from January, 2006 to November, 2019, when he was ousted from office. Evo is a controversial figure who many view as a corrupt political leader for maintaining his office well beyond the constitutional limits, though retaining a very strong, cerca 50% population support. This twitter user appears to distrust Evo, and defames his pick for the Head of Epidemiology, insinuating that this man is in charge not on merit but as part of Evo's corrupt regime. He therefore claims that the calming message from this man should not be trusted because the man is underqualified for the office he holds. People reading this tweet are meant to draw the conclusion that the Bolivian government is covering up the truth about the arenavirus and that the situation could be a lot worse than what the public is being told.

Many articles I looked at and tweets containing other articles referenced the work strike, or *paro*, led by the *Colegio Médico*. For example, CNN posted one of their own articles on Twitter (CNNEE, 2019):



<sup>23</sup> Translated: By halting of service doctors demand the Bolivian government declare the arenavirus outbreak a health crisis

<sup>24</sup> Explanation: the link is to a CNN article, the title of which is the text of the tweet itself.

This article, referenced by the tweet, mentions the actions the *Colegio Médico* took after the death of one of their colleagues while he was attending a patient infected with the Chapare virus where they protested to demand more government support for medicinal organizations. The government officials denounced this strike as a manipulative political move aimed at getting more money from the government. The public argument denies the public with a chance to find a clear reality, leaving the public in a state of uncertainty and confusion.

## **Chapter 6: Conclusion and Discussion**

The results from the analysis from my three sources of information (market survey, twitter scrape, article collection) concretely point to two things: medical mistrust and misinformation. Neither of these are surprising given the setting of the Chapare Virus outbreak; Zulawski chronicled the history of community distrust and medical mistrust in Bolivia as early as the beginnings of the twentieth century (Zulawski, 2007). The preexistence of these two phenomena, however, does not decrease the importance of the findings; rather, these findings suggest that community distrust and medical mistrust are problems that Bolivia will most likely face for years to come.

The data analysis results show that medical mistrust was a present and active force during the Chapare virus outbreak. Analysis from all three sources exposed trust gaps between medical professionals, government officials, and the public during the time of the breakout. These breaches of trust mean that the social environment encapsulating the public health sector in Bolivia was ripe for misinformation spreading.

Secondly, the data analysis results suggest that misinformation was spread and was a commonly recognized phenomena; misinformation spreading was a casually referenced topic in Bolivia in public media discourse. While this study did not find rampant misinformation spreading, the content found in the articles and tweets were enough to concur with the notion that it happened, though maybe not directly on the media sources I used. The reason I did not find much misinformation spreading was most likely because of the two media sources I used: Twitter and *Página Siete*. Twitter, while good for searching for misinformation in other countries such as the United States, is mainly used by the Bolivian upper class and academic circles. This means that the chance of misinformation spreading via this medium are lower than on other mediums such as WhatsApp; this socioeconomic group is more impervious to lies and misinformation because of higher education and access to more sources of reputable news coming from outside of Bolivia. In a similar vein, *Página Siete* is one of if not the most reputable news sources in Bolivia. This reputation has been earned because of their faithful adherence to the journalistic standard of objectivity, meaning they would be less susceptible to spreading misinformation and more prone to trying to fight it. Because of this, I wonder if my research would have yielded more direct results of misinformation spreading should I have chosen a different media source to examine, such radio broadcasts or WhatsApp data.

If I had more time and money I would expand this study to include data from WhatsApp, Facebook, and a few more online and paper news sources (such as *El Deber* and *La Razón*). I would also attempt to access radio broadcasts from Bolivia during the time period of the outbreak. I also would have liked to have conducted a few more public surveys.

The results of this study raise a lot of intriguing questions. Who is the current medical authority in Bolivia? Or, who are the main authorities in the Bolivian public health care field? Was this mistrust part of a broader mistrust of Evo Morales, and could this have been one of the events that led to his eventual downfall? Or conversely, could Evo's downfall have inflamed these sentiments? In countries like Bolivia where there is such clear mistrust in the public health sector, many systems set up both by the government and private practices could suffer because they have lost faith in the public eye. For example, while government tax dollars could be used to prop up the public healthcare system, the people may avoid it if they do not trust the government, disallowing the public health system to function in the same way that an illness would stop certain cells and parts of the body from functioning normally. The implications of medical mistrust and misinformation spreading are that societal bonds begin to dissolve and subsequently social institutions begin to crumble and decay, leaving a society ineffective at protecting its members. I echo the recommendation made by Earnshaw, Bogart, Klompas, and Katz for public officials to consider misinformation spreading when attempting to resolve present and future epidemics.

On a global scale, more research is needed on the subjects of misinformation and medical mistrust in the public health sphere. Given the recent global outbreak of Coronavirus, beginning first in China and extending throughout the world, epidemics are not only a thing of the past, but very much a part of the present and the future of the world. Research must be done to understand how to combat the misinformation and mistrust in local and international societies so that the world is able to adequately face epidemics and function in the midst of being attacked by them.

By finding ways to combat misinformation, community distrust, and medical mistrust, we can find ways to limit the effects of epidemics on the worldwide community.

It would be unethical to place the entirety of the burden of preventing misinformation spreading upon researchers and the political authorities. News agencies, for one, should strive to follow the journalistic standard of unbiased news reporting that is factually accurate in the same way that *Página Siete* did during the CHHF outbreak. More importantly, however, each individual person has the responsibility of deciphering between what is true and what is false.

Consumers of mass media must be wary of the many forces at work that are willing to sell them false truths. No one is a passive agent; all rational individuals must protect themselves from the threat of “fake news.” In the end, it is the global citizen’s responsibility to actively fight community distrust, medical mistrust, and the spreading of misinformation so that we can adequately face the epidemics that will face humanity in the centuries to come.

## Chapter 7: Bibliography

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