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THE ROLE OF INFODEMIC ON WHATSAPP IN THE COVID-19 PANDEMIC

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ABSTRACT

In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic - a disease occurring over a wide geographic area and affecting an exceptionally high proportion of the population[1]. The collective understanding of the effects and cures of COVID-19 is changing rapidly. Unfortunately, the infodemic is also playing an essential role in shaping the pandemic. An infodemic is described as 'a surfeit of information about a problem that is viewed as being a detriment to its solution.' [2]. This article examines how the infodemic (also referred to as misinformation, disinformation or fake news synonymously in this article) is implicated in (1) accelerating the spread of COVID-19, (2) impeding the availability of medical services, (3) causing collateral damage, including affecting those who are not infected by the virus, (4) stigmatizing COVID-19 survivors and their families, and (5) causing cascading effects of social problems. The class of misinformation that leads to each of the outcomes are identified. The actions taken by WhatsApp and Facebook Inc (the company that owns WhatsApp application) are identified, including the role played by the local legal authorities. We present novel survey evidence that shows people's lack of ability to recognize fake news, and the inability of the existing mechanisms in aiding people to tackle the infodemic. Another aspect of the survey is the kind of solution people are expecting from WhatsApp. So as a future direction, the authors identify a novel approach that can be taken by WhatsApp to prevent the spread of false information while keeping the core features of WhatsApp like end-to-end encryption intact using technologies like BlockChain.

Keywords: Coronavirus, COVID-19, infodemic, fake news, misinformation, WhatsApp, Facebook, Blockchain, end-to-end encryption.

INTRODUCTION

Since 2018, social media has outpaced print media as the source of news in US[3]. In 2018, on average, 28% of US adults got some form of their news from social media. It jumped to 55% by 2019, with the upward trend continuing in 2020.[4]According to Pew Research, worldwide, the phenomenon of getting news from social media is on the rise[5], similar to what is seen in the United States. A recent survey done by the authors in April 2020, where 250 people were surveyed across different demographics, across three continents, shows that around 68% (Figure 2) are getting some form of news from social media. Among information-seeking and commercial activities, more users on social media seek information about health and medicine for the family. A median of about six-in-ten did so in the year 2018[6]. Amongst the social media sites and applications, Facebook is the most popular social media destination. WhatsApp, also owned by Facebook Inc, is growing at a rapid pace, with over 2 billion worldwide users, with over 1 billion daily active users, with presence in over 180 countries. Among social media users, a median of 1 in 2 use WhatsApp[7]regularly, with an average of 30+ minutes spent every day on WhatsApp. It has become an essential source of news for many users worldwide[8].

Compare the rates of social media platform and messaging app usage in 11 countries around the world

% of adults who say they currently use ...

Country	Facebook	WhatsApp	Instagram	Twitter	Snapchat	Viber	Tinder
Colombia	63%	71%	25%	11%	7%	2%	2%
India	74%	79%	7%	4%	2%	1%	1%
Jordan	71%	78%	28%	8%	24%	8%	1%
Kenya	35%	30%	12%	10%	6%	4%	2%
Lebanon	68%	84%	34%	12%	18%	19%	2%
Mexico	62%	67%	20%	14%	10%	3%	3%
Philippines	58%	4%	10%	7%	6%	6%	1%
South Africa	47%	57%	13%	12%	5%	2%	1%
Tunisia	55%	14%	23%	7%	7%	18%	2%
Venezuela	64%	47%	20%	21%	5%	2%	2%
Vietnam	61%	2%	11%	3%	2%	8%	1%
	Facebook	WhatsApp	Instagram	Twitter	Snapchat	Viber	Tinder
MEDIAN	62%	47%	20%	10%	6%	4%	2%

Facebook, WhatsApp are most popular apps for people who only use one social media or messaging service

Among adults who use just one social media platform or messaging app, % who say they use ...

	Facebook	WhatsApp	Other sites
Philippines	99%	0%	1%
Vietnam	98	0	2
Tunisia	93	1	6
Venezuela	84	12	4
Kenya	65	21	14
Mexico	32	66	2
Colombia	25	72	3
Jordan	22	76	2
South Africa	21	77	2
India	16	76	8
Lebanon	4	96	0

MAJORITY USE FACEBOOK   MAJORITY USE WHATSAPP

Note: Social media platform and messaging app users include those who say they use one or more of the seven specific online platforms measured in this survey. "Other sites" include Instagram, Snapchat, Twitter, Viber and Tinder.

Source: Mobile Technology and its Social Impact, 2018. Q10a-g "Mobile Connectivity in Emerging Economies"
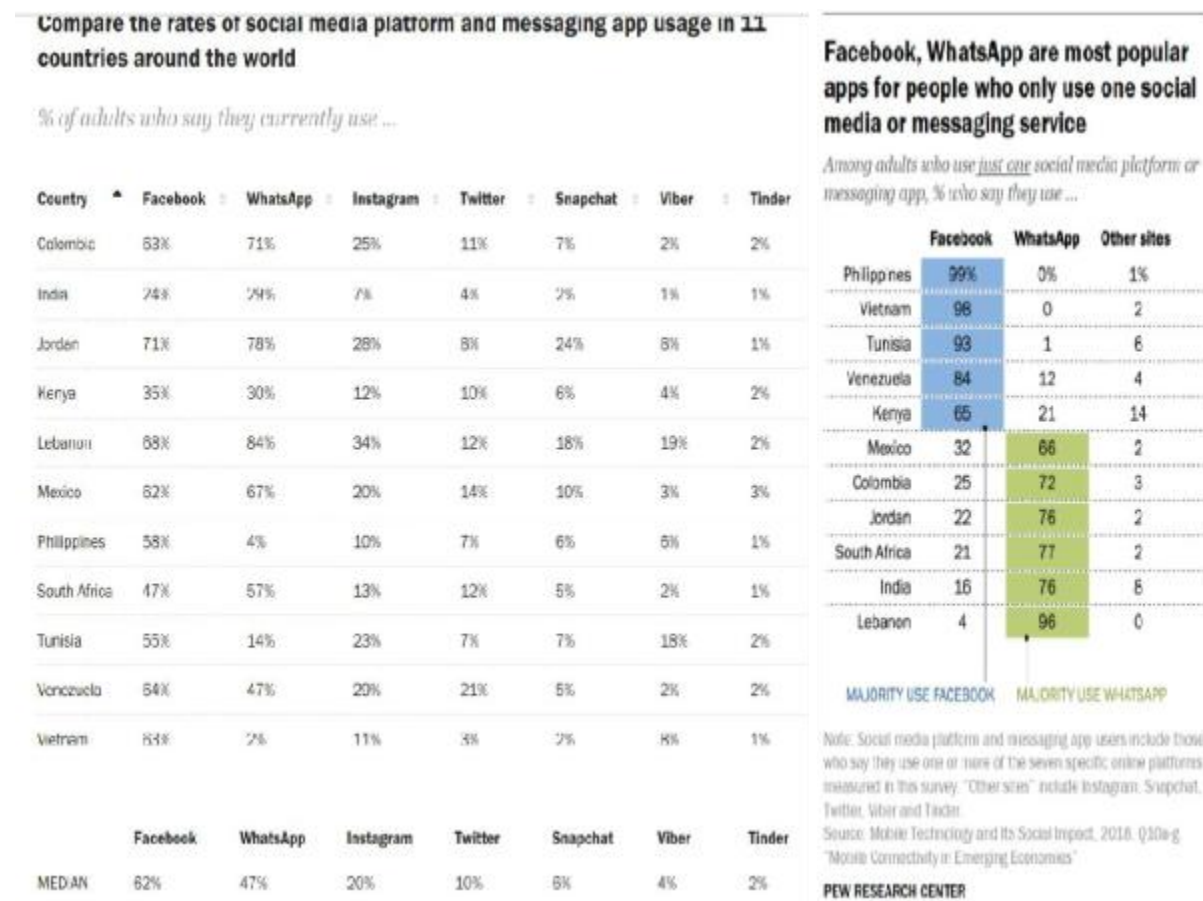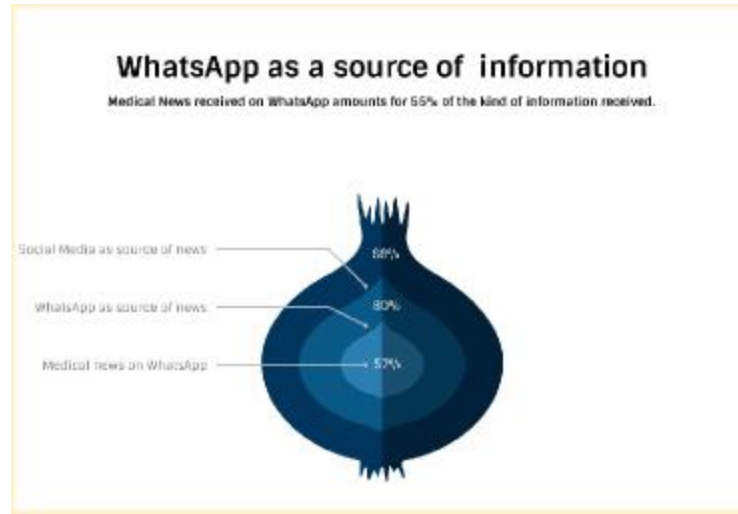
PEW RESEARCH CENTER

Figure 1

Figure 2
Based on survey done by authors in April 2020

Pew Research conducted surveys of adults in 11 emerging economies, where they see social media platforms enhancing people's connectivity and access to information. Still, they also admit that the information on these platforms is easy to manipulate by foreign and domestic actors and increases violence and hate crimes. According to the same research firm, Americans view made-up news and information as a bigger problem than other critical issues, including terrorism, immigration, climate change, and racism.[9][10]

Facebook has been one of the primary platforms associated with the misinformation and shaped the 2016 presidential election in the US. However, in other countries, the fake news and other falsities are equally or more likely to spread on private messaging platforms like WhatsApp. Sometimes these falsities have fatal consequences - in India, at least two dozen people were fatally lynched in 2018 - their deaths fueled by rumors spread on WhatsApp. In Brazil, messages amongst private groups falsely claimed that yellow-fever vaccines were dangerous, leading people to avoid it. In Mexico, experts called WhatsApp the ugly underbelly of the country's primary source of news, where politically misleading stories, memes, and messaging spread unchecked.[11]

As the world fights the COVID-19 pandemic, social media has connected families who are separated because of the risk of infection. However, the same social media has caused the infodemic malice and helped generate a blizzard of dangerous fake news. "The coronavirus has a simple fix; all you need to do is drink hot water every 15-20 minutes to flush the virus out of your system. By drinking warm water, you force the virus into your stomach, where stomach acids can kill it." While hot water is good for the body, it does not help fight COVID-19.[12] This cure, along with a variety of other false treatments, is being spread across the internet daily on

social messaging apps like WhatsApp. It is this infodemic, intertwined with the COVID-19 pandemic, that is proving to be a fatal combination.

In this article, we explore how people's tendency to believe information shared with them on the social media platform, especially WhatsApp, from individuals whom they trust, is having a devastating effect on the fight against the COVID-19 pandemic. While recognizing that social media platforms in themselves aren't evil, rather they play a vital role in keeping the people informed about current events and giving them a voice. This article explores the steps taken by the social media platforms, regulating agencies, and non-profit organizations who want to fight back against misinformation. However, this fight is complicated since WhatsApp hosts private chats among groups of friends. It is encrypted so no one, including service employees, can read the contents of messages that were not intended for them. WhatsApp doesn't require users to reveal their real name, and with limited visibility into what they have posted in the past, it is hard to ban them if they have exhibited malicious behavior. Keeping these constraints in mind, the authors suggest their ideas on how to fight the misinformation pandemic based on technologies that are being experimented in fields of journalism.

INFODEMIC ON WHATSAPP SHAPING THE FIGHT AGAINST THE PANDEMIC

Fear and panic are instrumental for human species survival. Ideally, fear would motivate effective and protective actions. However, during the current epidemic, the population at large did not operate rationally and logically; instead, they let the fear and panic interfere with their cognitive processing. Individuals' assessment of risk is generally poor, even with all the information. In the current pandemic, it was hampered by either lack of information or worse, by the spread of incorrect information. This lack of information was then followed by the individual's actions influencing other individuals and slowly causing mass reactions. In some cases, the mass hysteria reached a tipping point and resulted in the erosion of the system of governance. The sections show how misinformation, sometimes spread intentionally but mostly unintentionally, caused the population to go through the various stages of irrational and illogical behavior, leading to the lack of a system of governance.

ACCELERATING THE SPREAD OF COVID-19

"Black people are immune to the coronavirus...", "There are zero COVID-19 infections in Africa...", "Black worshippers cannot be infected at church..." These are just some of the false information that has been spreading on social media. This myth of group immunity has a long history of racist ideas serving the social and political needs of the moment, experts say. This myth, despite repeated clarifications provided by epidemiologists that there are no genetic differences, of proclaimed immunity or susceptibility to the disease is based on race.[13]

Another absurd and conspiracy theory floating around is the claim that the coronavirus is a satanic plot to bring socialism to the US and the pastor pushing this theory is encouraging his congregation to get together to fight Satan.[14] All the absurd, conspiratorial, and sometimes profoundly rooted racist theories are encouraging people to defy government policies of social distancing and gather in large congregations.

These myths are shaping attitudes of individuals or groups, but also shaping policy and practice in public and private space, in hospitals and schools. In a survey of 222 medical students, it was discovered that half of them believed in there being biological differences between black and white people, and they used different standards in measuring lung functions. Black patients must register more significant breathing difficulties before acute medical interventions are offered (Figure 3). These preconceived misconceptions lead to not testing and treating people from certain ethnicities with symptoms promptly, thereby exacerbating and increasing the spread of the virus (Figure 5).
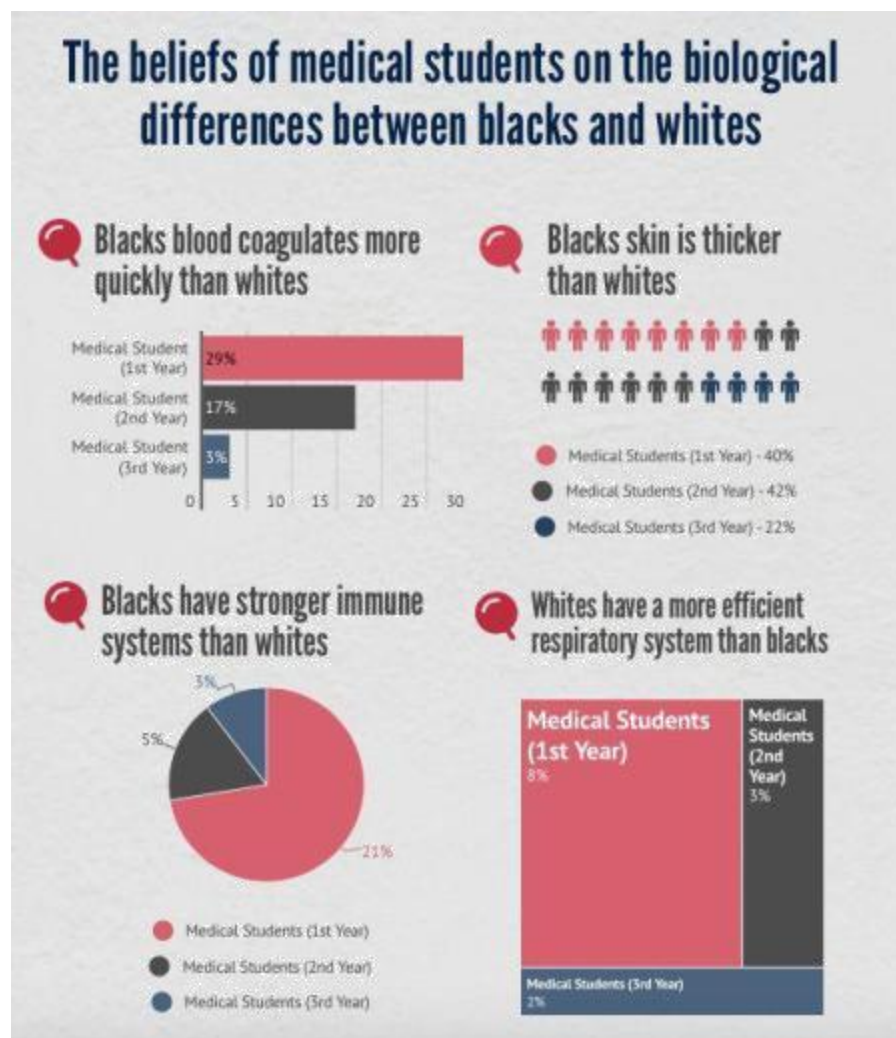
Figure 3

Taking these misconceptions to the extreme, it has made many to believe that individual races or ethnicities are immune to the virus. These supposedly immune races or ethnicities continue gathering in large numbers, increasing the chances of spread of the virus.[13]This behavior has been observed amongst many religious groups and congregations across the world. Hundreds gathered in a town in France, traveling thousands of miles from countries as far West Africa, Guyana in Latin America, and Switzerland for a weeklong gathering. Someone in the congregation was carrying coronavirus and has been linked to around 2500 cases spreading to far off countries and continents.[15]A similar meeting of religious groups believing they cannot get infected in the church has resulted in 5000 confirmed cases in South Korea. In Bangladesh, a Muslim cleric made similar claims and encouraged tens of thousands of people to gather for a mass prayer.[16]

Places in India and other Asian countries believe that loud sounds, such as the "cosmic-level sound waves" created by the collective cheer of the citizens, can cause the virus to retreat. A celebrity with over 40 million followers on social media, said clapping and blowing conch shells would "destroy virus potency." The false information led people to gather in large numbers, ignoring social distancing rules set by the local governments trying to collectively create these "cosmic waves" and having a false sense of invincibility.[16] The social media post was soon removed, but not before it was viewed and reacted by thousands. At the same time, the news was spread indiscriminately across the various social media sites, especially WhatsApp, with little ability to be able to track and remove such messages.

IMPEDING THE AVAILABILITY OF MEDICAL SERVICES

Health workers and other humanitarian helpers are sometimes doubly jeopardized. First, each day, they face viral infection risks in the line of duty. Second, some workers are intentionally targeted for harm based on misperceptions that they were spreading diseases. Misinformation spread on social media platforms incited violence against health care professionals in India. Fears that healthcare workers treating COVID-19 patients will themselves get infected and spread the virus in their communities, resulted in stones being pelted at the health care professionals. Attacks on doctors have seen a rise in the city of Hyderabad, India[17]. Meanwhile, in Oklahoma City, USA, a nurse was attacked on her way to work, because the perpetrator believed that the nurse's role in healthcare was exposing her community to COVID-19[18]. Many nurses and midwives across New South Wales, Australia, were told not to wear their scrubs outside the hospital in the wake of several healthcare workers reporting being assaulted and spat on by the members of the public.[19]

Not only that, landlords and housing complexes in Manilla, Philippines have gone as far as to evict healthcare workers from their homes, and some have been forced to sleep in hospitals.[20] In parts of India,

physicians and their families are being ostracised because of their exposure to infected patients. These are limiting the availability of medical professionals, or when available, their ability to offer help to people in need.[21] [22] [23] [24]

"When we are infected, no one is safe," Kim Smith, a registered nurse in Texas who works in an intensive care unit now dedicated to treating COVID-19 patients, said in a news release announcing the protests[25]. False information spread on social media sites, primarily WhatsApp, is impeding the availability of medical devices and services. An unverified message on WhatsApp said that several areas in the city of Bengaluru, India, will be sealed. This triggered panic buying of essentials in various localities[26]. Similar misinformation resulted in cases of stealing thousands of face masks and bottles of sanitizing gel from a public hospital in Paris[27]. The news was spreading like wildfire on local WhatsApp groups that the stores were running out of essential food items and daily essentials like toilet paper and hand sanitizers. This caused panic amongst the residents and resulted in panic buying and hoarding of not only the everyday essentials, but also personal protection equipment like gloves, protective face masks, goggles, face shields, and aprons. This was putting the lives of the medical professionals at risk from the new coronavirus and leaving them ill-equipped to care for COVID-19 patients. The severe lack of protective masks is resulting in medical professionals flaunting the Centers for Disease Control and Prevention (CDC) recommendations and reusing one-time use face masks for up to five days, putting the patients and their own lives at risk. In California, more than 50 health care workers have tested positive for the virus through person-to-person transmission[28] due to a lack of personal protective equipment. When ten nurses refused to work due to a lack of appropriate face masks in the coronavirus unit, they were suspended for weeks.[29] Similar phenomena have been observed around the world, with doctors and nurses in Zimbabwe having refused to resume work until the government provides them with proper gear.[30] [31]

The hoarding of the personal protection equipment due to panic caused by the numerous videos of empty store shelves being circulated on social media caused them to not be available for the medical professionals[31]. Due to this, the medical professionals either refused to work or when they demanded time-off from the hospitals, they were suspended. This made the precarious situation of lack of availability of medical professionals to care for the COVID-19 patients to get even worse.

Another false claim circulating in Bradford, UK, states, "Please don't show my details. I work for BRI hospital trust. I am begging all the ummati [community], if you have any health condition please do NOT go to [the] hospital. You will not come back alive from this trust… Also have your daily black seed oil which prevents all disease." The effects are felt in the community, where either the patients are scared to be admitted to the local

hospital, or if admitted are self-discharging themselves, because they think the doctors are leaving the South Asian patients to die.[33]
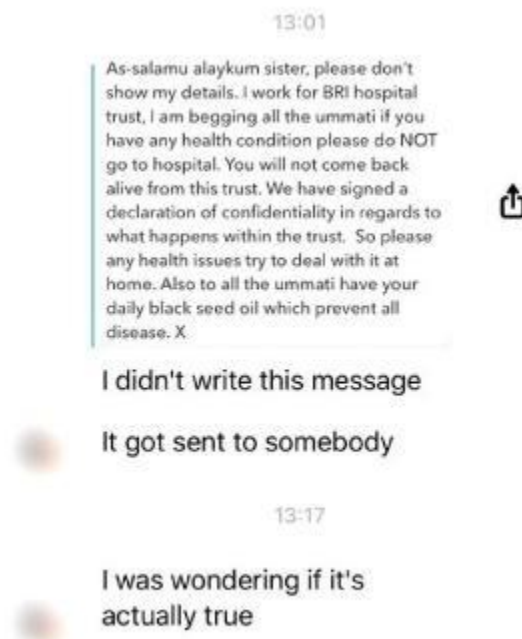
Figure 4
Sample of fake news spreading on WhatsApp in Bradford, UK

The false claim about the availability of coronavirus tests is causing people to crowd hospitals in hopes that they will be able to test themselves. The false claim also causes people who know they do not have the symptoms to test themselves, causing people who do have the symptoms, not to be tested. The supply is limited, and if someone is found with severe symptoms and doctors are unable to check them, and hence cannot help people recover.[32]

CAUSING HARM TO THE NON-INFECTED POPULATION

Over the last several months, people have been sharing a variety of odd cures that have claimed to help fight the coronavirus. Some include the usual medication like Ibuprofen, which is used to cure headaches and inflammation in the body. In contrast, others are more bizarre "cures" like ingesting fish-tank cleaning products, which was claimed to contain Chloroquine, which is used to prevent or treat malaria. However, fish tank cleaning products contain chloroquine phosphate, which is not suitable for human consumption and has killed many people. Another bizarre "cure" is drinking a bleach-based substance to try to poison and kill the virus but is

instead attacking the body and killing many people. Misleading information is causing the deaths of many people who were not even infected by coronavirus but wanted to take precautionary measures. [34] [35]

People are coming up with counterfeit medicines in the form of gels, liquids, and powders claiming to get people immunized against the virus. Hackers and scammers are scamming people out of their money with personal information using the front that they are delivering the cure for the virus. In actuality, the 'cure' is killing more people because they are attacking organs and integrating themselves into the blood system.[36]

Based on the survey carried out by the authors, 91% of the people were somewhat or very confident in their ability to identify fake news. Moreover, the same segment of people when asked how many times they have followed the tips related to preventing COVID-19 (they have all been debunked by the medical community as ineffective in preventing or curing COVID-19), 44% of them said they had followed them at least once. People are grossly overestimating their ability to detect fake news:

Figure 5

There are many fake, but official-looking websites that claim that Taiwan was giving away protective masks and vaccines for the virus. Many people are sending money to these websites to be disappointed in the end since there is no vaccine.[37]

People are also trying to self-diagnose themselves, like holding your breath for more than 10 seconds to see if you cough. If you cough, you may have the virus, and if not, you are safe. Other sources say that if you feel a drowning sensation or have a dry cough, you have the virus. These ideas of self-diagnosis can get people into danger because people with no real symptoms are going to use all of the identification-shots leaving those with life-threatening symptoms, with no way to know if they have the virus so that they can improve their health.[12]

STIGMATIZING COVID-19 SURVIVORS AND THEIR FAMILY MEMBERS

"It felt like we had the scarlet letter 'C' on the house," said Anne Aguirre after a traumatic night trying to get help to her father's house in New Orleans, US. Anne's father, 79, has recently recovered from COVID-19 and was sent home to his New Orleans home. When he fell and called the local fire department for help, the department refused to come. The fire department knew Anne's father had a history of coronavirus infection and refused to go and instead asked him to get help from paramedic services, which arrived 6 hours later. "The general public still has that fear," she said. "Unless they trust you, they are going to be reluctant – 'You had that virus, I do not want to come.'" [38] This was hardly an isolated incidence of stigmatizing a COVID-19 survivor. In San Diego, the death of a young pharmacy worker due to COVID-19 touched off a wave of fear and rumors amongst a small Arab community. When the owner of the pharmacy announced that he was ill, news quickly spread on social media that he, too, was infected by coronavirus and possibly even died. A local doctor in San Diego went on the local television, trying to dissuade people away from the pharmacy. The rumors have hit his business so hard; he has lost half of his business.[39] This was an incident where the stigma spread to the entire community.

In another incident in Indiana, the police department refused to administer doses of Naloxone to those who overdose on opioids, as it is administered through the nose, and they are scared of the risk of exposure to coronavirus. The state director of emergency medical services has issued a directive saying the chances of infection are negligible. However, fear and misinformation are causing collateral damage, where people who aren't affected by the virus are being negatively impacted.[40]In South Africa, public health officials have raised concerns that residents falling ill are avoiding medical treatments for fear of being shunned and ostracized as

coronavirus survivors. Globally, approximately 700,000 Chinese students studying in the United States, the United Kingdom, and Australia are being avoided due to the linking of coronavirus to China[41].

The stigmatizing of the survivors, their families, or their communities is backfiring as individuals and communities are avoiding the care and treatment they need. With more than 4M cases and 275,000+ deaths as of May 2020[42], the obverse is equally essential to consider; the survival rate is higher than 90%. All the survivors dealt with a life-threatening illness that qualifies as direct trauma exposure for the possible development of posttraumatic stress disorder (PTSD).

"Stigma, to be honest, is more dangerous than the virus itself," stated Tedros Adhanom Ghebreyesus, the WHO director-general.

It is still early to say whether the survivors of COVID-19 and their families will be subject to a subsequent pandemic of mental-health problems like PTSD or stigmatizing. However, the early indications, again intensified by the spreading misinformation and hatred on the social media messages, indicate that xenophobia is not far behind. Since the outbreak of coronavirus, reports of racism towards East Asian communities in the Western countries have grown apace. A big part of this xenophobic reaction is the social media messages trying to blame China as the source of the coronavirus, and in some cases, even going to the extent of saying that the virus was 'manufactured' in Chinese labs. Some media outlets and U.S. leaders continue to refer to the disease as the "Wuhan virus." (Figure 6). The U.S. Senator has gone to the extent of asking Americans to boycott Chinese made goods and have asked help from companies like Amazon in helping Americans with the boycott.[43]

Restaurateurs in San Francisco's Chinatown report that business has dropped since the start of the outbreak, and a Vietnamese artist was disinvited from a London art fair because of fears she would be perceived as a carrier.[44] [45] The racial comments are not limited to Western countries; East Asian countries like Thailand are reacting and lashing out at Caucasians, who are wrongly accusing them of being dirty and spreading virus in their country.

CAUSING CASCADING EFFECTS OF SOCIAL PROBLEMS

During the outbreak, disease and fear, fuelled by misinformation, were enmeshed to contribute to stress at societal and community levels.

Fear of disease transmission and misinformation about persons who were perceived to be infectious has become entangled with decisions regarding movement restrictions. A small town in Ukraine became a victim of rumors and was in a state of panic and chaos stemming from residents' fears that COVID-19 was going to bring death to these unknown backwaters. The alarm was due to a mix of limited information released by Ukraine's authorities, disinformation spread on social media, and a targeted fake news campaign. In February 2020, a plane from Wuhan, China, arrived in the country, and word started getting around that several of Ukrainians and foreign nationals on board were infected with COVID-19. The authorities had stressed that all the evacuees were tested, and none of them were infected. However, the rumors that some evacuees were infected and would be housed in the medical facility in the town of Novi Sanzhary quickly took hold throughout Ukraine and caused an uproar. The situation deteriorated within a short period with National Guard in armored vehicles patrolling the streets, which affected negatively and brought tensions to a boiling point. The ensuing riots between the residents and the law enforcement lead to nine injured police officers and 24 people arrested for rioting. This was caused by a spoofed email containing misinformation to sow discord in Ukraine, and panic spreading through messages on WhatsApp group.[46]
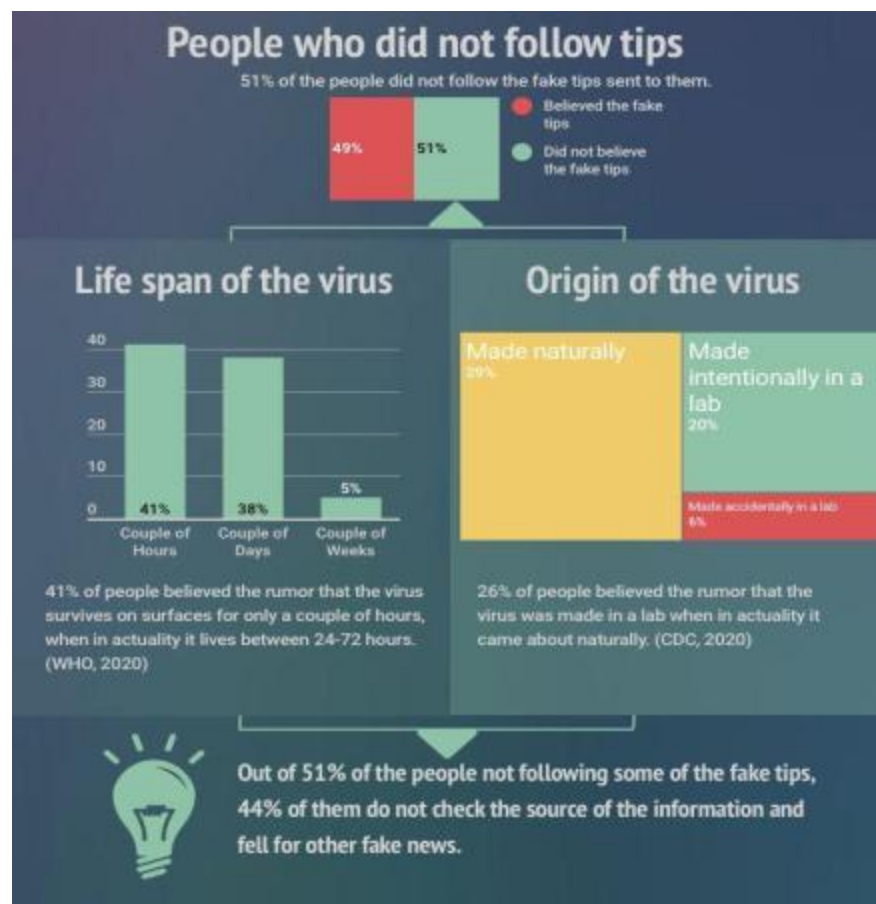
Figure 6

The pandemic has crippled the Chinese economy, with fake news spreading on social media that the coronavirus that causes COVID-19 can survive goods shipped from China for up to 28 days, playing its part. The collapse in activity affected every sector of the world's second-biggest economy. In the first two months of 2020, the retail sales plunged 20.5% over the same period in 2019; industrial output was down 13.5%. The spread of misinformation did not cause all of the devastations, but it has played a role. Moreover, claims made by US Senators like Rick Scott to avoid the Chinese made goods are not helping the cause[43]. However, the extent to which it has affected is not known at this point. There have been repeated clarifications by WHO and other health organizations that package transit conditions are not conducive to the virus remaining viable; people are scared to order online, whether it be within their own home country or overseas from China. This fear is further exacerbating the impact on the fragile economy that is teetering on the brink of a recession because of the lockdown.

FIGHT AGAINST THE MISINFORMATION PANDEMIC

SOCIAL MEDIA COMPANIES' FIGHT

Fully recognizing how fake news spreads, one of the things WhatsApp is doing to curb misinformed news is limit the number of times a message can be forwarded. Once a message has been forwarded more than five times, it can only be further forwarded to a single chat instead of multiple chats[47]. This it doesn't solve the problem of spreading fake news, but as it introduces friction in the process, it might help in reducing the spread of viral messages on the platform. Along with that, WhatsApp is making it very obvious when something is being forwarded.

Until 2018, users were able to forward messages to 250 groups at once. That was later reduced to 20, and then down to 5 in 2019. Now it has gone down to one; this has, however, only reduced the messages forwards by 25% globally.

Another feature WhatsApp is slowly rolling out is if the message is forwarded, then the user can upload it to Google Search engine and check for accuracy right from within the app[48]. This feature is useful; however, the authors doubt the overall efficacy of this approach for multiple reasons. The general concern of uploading messages to Google and compromising the privacy of messages, and secondly, the kind of messages being shared are mostly local and in local languages, and determining the authenticity promptly by search engines like Google might not be possible.

Knowing that the best antidote to infodemic is authentic news from reputable sources, WhatsApp announced Coronavirus Information Hub - in partnership with the WHO, UNICEF, and UNDP. Through Information Hub, WhatsApp offers actionable and straightforward guidance and resources for users to be better informed about the disease and hence reduce the spread of rumors. WhatsApp is also working with WHO and UNICEF to provide messaging hotlines for people around the world to use directly.[48] [49]
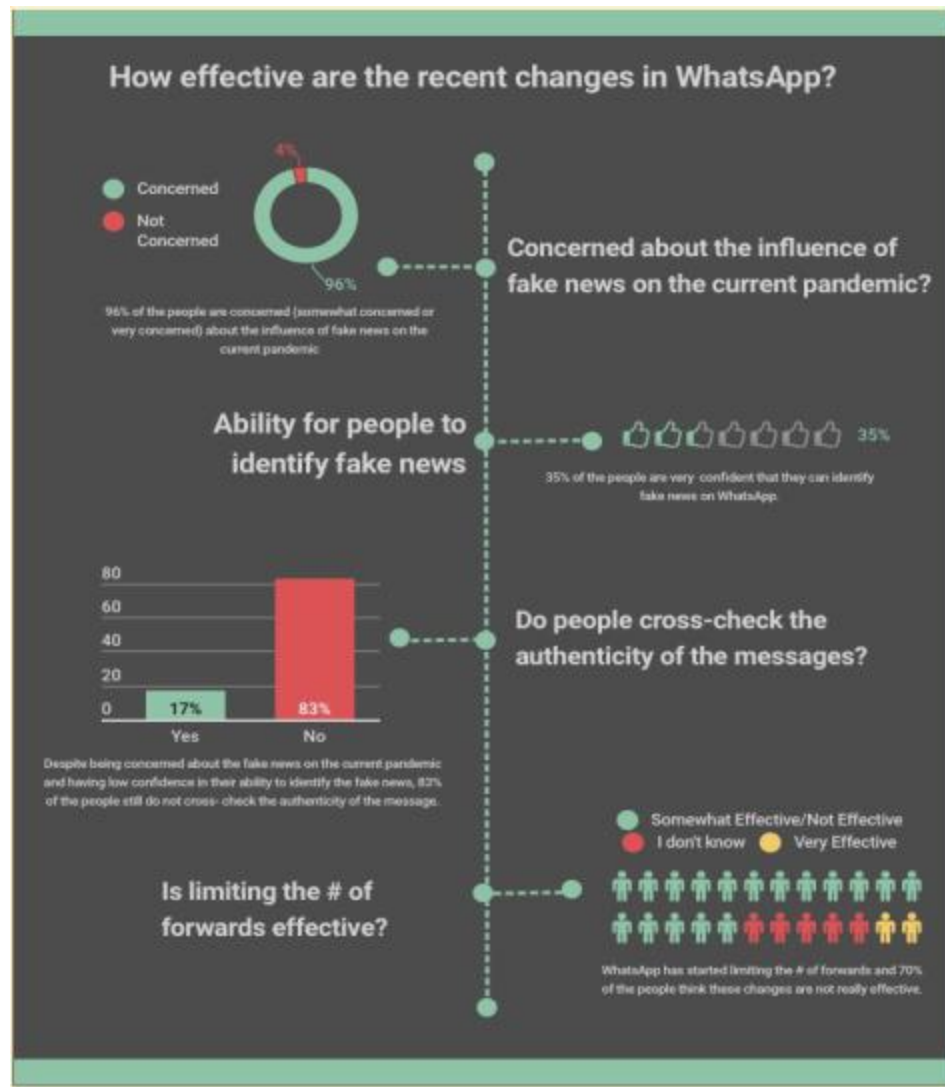
Figure 7

However, the survey conducted by the authors shows that even folks who are highly concerned about fake news on WhatsApp (96%) and do not have high confidence in their ability to recognize fake news (65%), do not cross-check the authenticity of messages against the Information Hub setup by WhatsApp (83%). Moreover, neither do they think that limiting the number of forwards has been effective, as they continue receiving fake information on WhatsApp (70%).

LAW AND REGULATIONS AGAINST THE SPREAD OF MISINFORMATION

Laws are being created to criminalize the spreading of fake news. Singapore ordered Facebook to take down access to some pages that the government said contained false information about Coronavirus, else the company would be fined up to $14,400 a day under the law. Facebook, in turn, took down the local pages on Facebook but could not do that on WhatsApp as the information is encrypted, and Facebook does not have access to it.

In Thailand, Indonesia, Malaysia, India, and Morocco, authorities have arrested people for allegedly spreading falsehoods related to the outbreak, either on social media websites or through WhatsApp. In Nigeria, lawmakers are debating a bill inspired by Singapore's.[50 51 52 53]

Governments taking action against online misinformation (up to date as of May 2020)[54]
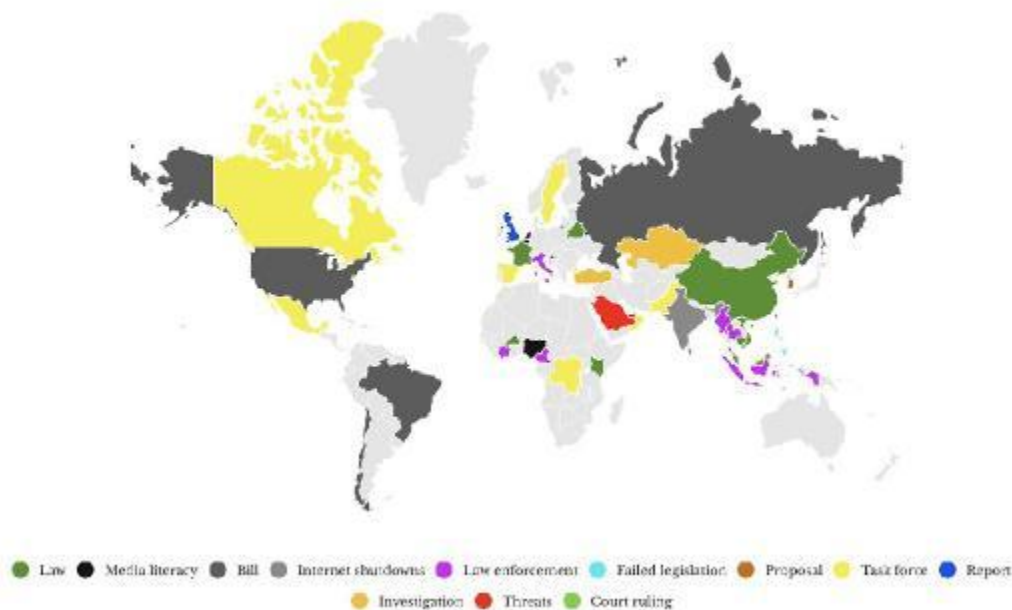
Figure 8

Similarly, New York State ordered conspiracy theorist Alex Jones to stop making misleading claims about supposed coronavirus cures that can turn people's skin permanently blue.[55] Humanitarian-to-humanitarian (H2H), a network of non-profit organizations in the UK is working with social media influencers - vloggers and bloggers - to help spread accurate health information and reach younger online audiences that are more susceptible to fake news.[56]

Russia ordered many social media sites to take down information that might cause the spread of the virus. The Russian government claims that if it is not down, the website and the person who posted the false news will be fined under several different laws explaining the harm of spreading news that may harm the public's health.[57]

While laws and regulations against misinformation are welcome and will play an essential role in limiting the spread of fake news, however, many of the regulations are far from perfect. Muddying the issue is the precise definition of misinformation or fake news, and lack of agreement amongst the constituents whether the provisions teeter on the border of infringing free speech guarantees, the entire approach by law enforcement agencies can be termed as work in progress.

FUTURE IDEAS

Despite the actions taken by the law enforcement agencies, and WhatsApp platform itself, fake and misinformation continue to spread on the platform unabated. Various governments are asking for traceability of WhatsApp messages, but there are concerns that this would also enable snooping on messages. Governments have demanded that WhatsApp "digitally fingerprint" all messages. Facebook has pushed back thus far, arguing it would undermine user privacy.

Keeping the core tenets of the WhatsApp platform, which is to provide end-to-end encryption[58], with no ability for anyone (including WhatsApp service) to snoop on messages, the author is suggesting a novel approach for tackling misinformation.
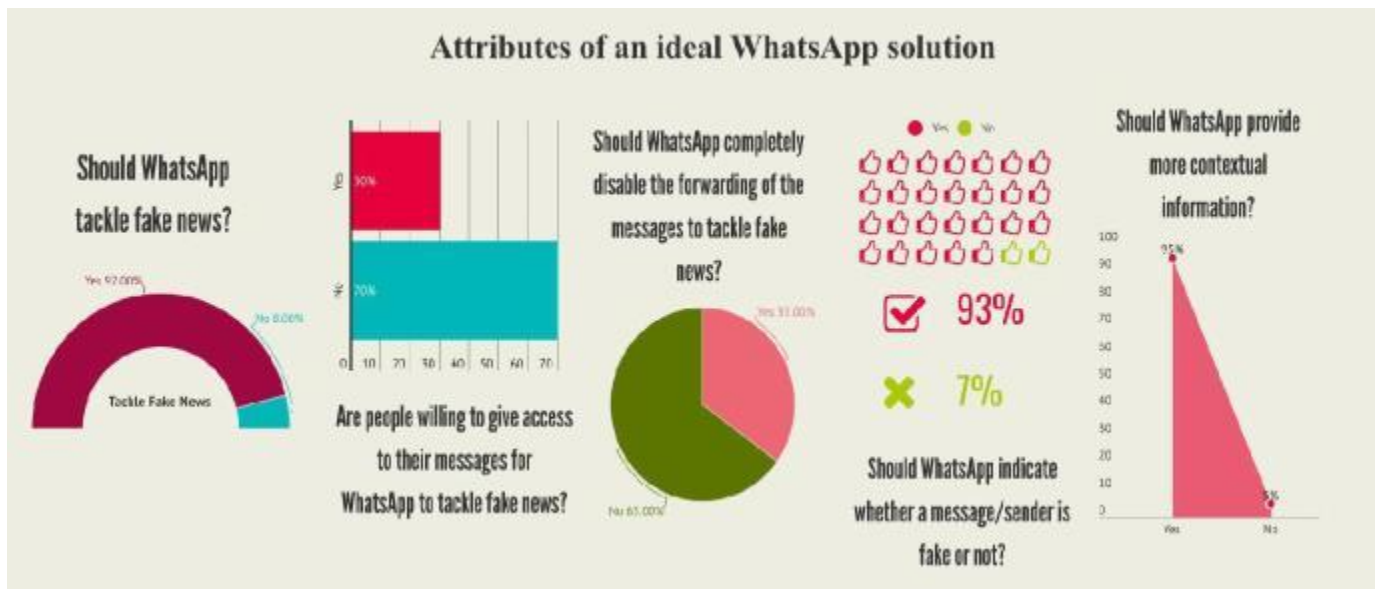
Figure 9

Any solution that is not acceptable to users due to concern of privacy will not be effective. To determine what the core attributes of the solution that will work, the authors reached out to actual users of the platform and discovered that the overwhelming majority want WhatsApp to tackle fake news (92%). They are, however, very privacy conscious and would not want to give access to the messages to WhatsApp (70%). Moreover, knowing that limiting the number of times a message can be forwarded is not working; still, the same set of users are not ready to ask WhatsApp to disable forwards completely (65%). They rather want that WhatsApp should indicate that the given message or the sender of the message is known to peddle false news. Furthermore, provide contextual information like the source and date/time the message was initially created.

Keep the core tenets of the WhatsApp platform like end-to-end encryption and the attributes user is looking for; the idea is to identify misinformation in multiple stages, as described below:

1. Informational message

The first stage is to determine if the content shared on WhatsApp is a 'social' message or intended to be 'informational' (political, health, or medical-related). This determination is done the moment the message is being sent or forwarded from the user's device. This is done on the user's device, where the message is available in the clear, i.e., unencrypted. Furthermore, this is done automatically by WhatsApp application without user intervention and the resultant determination along with a fingerprint of the message stored in the 'metadata' section of the message that accompanies the message. Metadata is a set of data that describes and gives information about other data; basically, it is data about the message. The category of the message and the digital fingerprint isn't encrypted and available in the clear to WhatsApp servers, similar to the other metadata, which WhatsApp already stores like phone numbers, timestamps, connection duration, connection frequency, and user location[59]. The digital fingerprint has the property that it does not leak any information about the message itself.

The problem of determining the category of the message is considered as a text categorization problem. This problem domain has been studied quite extensively, and both rules-based categorization techniques and machine learning-based categorization techniques exist. Machine learning-based categorization using algorithms like linear regression or random forest and many variants of Deep learning algorithms exist in the industry, which can be used for this purpose.[61]For the sake of brevity, the literature on this topic is not replicated here; rather, the reader is encouraged to refer to the referenced material.

2. The authenticity of the message

In the second stage, if the message is deemed to be informational and of journalistic intent, then record the origins of the content. In this stage, WhatsApp application asks the user who is sending the message to identify the source of the message (e.g., website or a research article the information originated from, or if the sender is the author). If the sender is the author, WhatsApp application records the location, the date, and time it was authored. This information again is recorded in the 'metadata' section of the message.

Here, we are relying on the source of information (be it a news website, a research publication journal, or even WhatsApp platform in case the information was created within WhatsApp application) to maintain a distributed ledger of all the content published through them using a technology called Blockchain. Blockchain is a growing list of records, called blocks, that are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. By design, a blockchain is resistant to modification of the data[60]. We chose Blockchain as it helps maintain a transparent and immutable record of the content's origin and can be accessed by a network of organizations for verification with the assurance that no single organization can change the contents once they have been committed to the distributed ledger.

The idea is to establish the article's origin and document the journey from the source to the endpoint so that consumers know they are dealing with an article with a clear established lineage from the source to the destination. As most misinformation is shared unintentionally, the authenticity of the source will also be shared with the author.
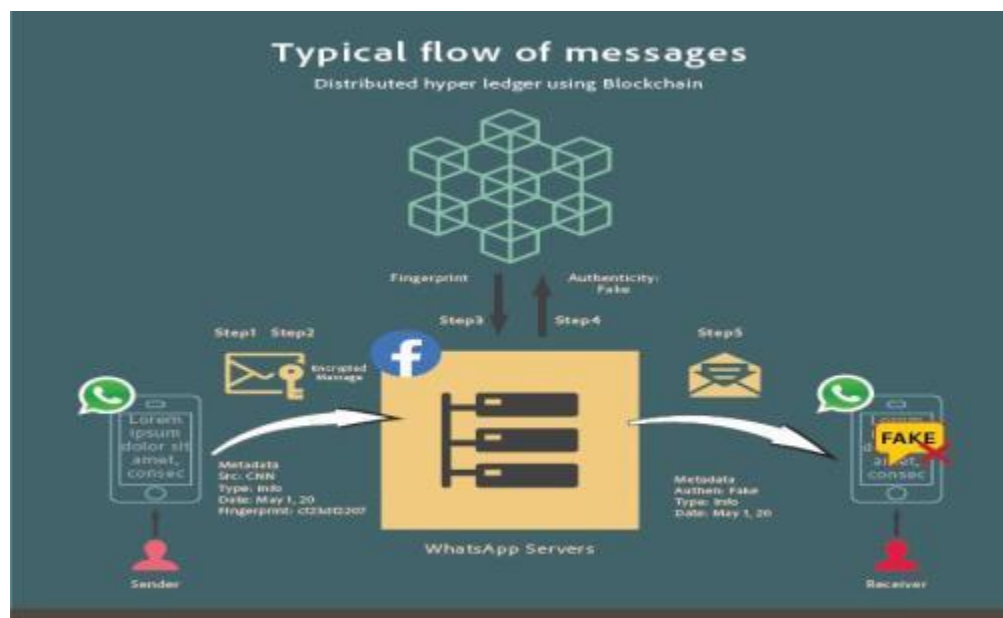
Figure 10

3. Verifying authenticity

Before forwarding the message from one user to a WhatsApp group, WhatsApp servers cross-check the authenticity of the message by communicating with the source identified in the news. If the message does not have a source or the source isn't available to verify the authenticity, those facts are recorded within the message.

The verification is done by referring to the distributed ledger and ensuring that the message's digital fingerprint exists in the record created by the source, where the source is what is specified as per the message. If the digital fingerprint exists, then the date/time, location, and other properties of the message are fetched from the distributed ledger.

4. Source reputation

Once the content has been verified, WhatsApp servers apply other heuristics to determine the reputation of the source very similar to what search engines do to determine if a particular website is more prone to peddling misinformation.

WhatsApp can also provide the ability for users to mark a message as misinformation or outright fake news within the application, which then gets recorded against the source of the message. This, again, can feed into the reputation of the source for future messages.

5. Providing source transparency to the user

As timing is vital, the source associated with the message needs to be provided right at the time the user sees the message for the first time. Research has shown that once the user is exposed, the incorrect understanding of the user is complicated to overturn[61]. Hence if the source can't be verified, the source claims the information is false, or the source has been historically known to distribute false information; all this information will be present in an obvious way to the user, potentially preventing the user from seeing the information. As the scheme slowly gets adopted, care will be taken not to be overzealous and messages that are missing a source, either because they are from a small or independently operated news/article sources, they will not be marked as untrustworthy. In such situations, appropriate indications will be provided to encourage users to verify the authenticity on their own, similar to what WhatsApp already is thinking where users can upload those messages on Google right from within the application to determine authenticity.

Information like the source of the information, description, location, time will be made visible. Lastly, as the message travels through different sources, provide that transparency to the user so the user can form their own opinions of the publisher's bias.

6. Providing transparency into how the system works

To increase the user's comfort and confidence in the WhatsApp platform, WhatsApp and the publishers participating in the program must provide clear documentation on what data is collected, how it is maintained and used. It should demonstrate oversight and accountability in order to help people trust that the presented information is accurate.

CONCLUSION

This article has enumerated and analyzed the various categories of misinformation shared on WhatsApp and their potential impact on the fight against COVID-19 pandemic. It seems apparent that misinformation exerts considerable influence on all the phases of the outbreak, leading to increased viral transmission, interfering in the availability of medical services, causing collateral damage including to a section of the population not even affected by the ongoing pandemic. It also stigmatizes the survivors, causing increased psychological distress, and creating a cascading effect on societal issues.

As with any communicable disease, early cases exhibit disproportionate effects on the downstream cases of infection. Therefore, some of the misinformation that leads to the initial behavior of flaunting the government's order of social distancing, and panic leading to hoarding of personal protective equipment and non-availability for medical professionals contributed significantly to amplifying the magnitude of the outbreak.

If the spread of misinformation on the social was prevented early in the outbreak, a sizeable proportion of the outbreak associated mortality, economic costs, and social consequences could have been circumvented, very similar to early intervention and prevention of 'Fear related behaviors' could have restricted the spread of Ebola virus outbreak in African countries[62]. Quantitative modeling will need to be conducted to determine the extent to which the pandemic could have been controlled.

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