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Social Media and Health Mobilization During Emergencies: The Case of Lassa Fever Outbreak in Ebonyi, Nigeria

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Abstract: Lassa fever is an existential threat to Ebonyi, one of Nigeria's 36 states, located in the southeastern region. Communication is a critical component of the integrated approach the government has adopted to combat the disease. This study examines the influence of social media in the management of the 2018 outbreak. Results from 426 respondents show that 74.47 percent received their first story on the outbreak via social media, while 72.30 percent visited social media platforms daily. *Facebook* was the dominant social media subscription - 87.56 percent. A significant 97.88 percent visited at least once a day. Findings also show that, after the visits, 74.08 percent took preventive actions from food infection. This figure accounts for a little more than half of the total preventive actions taken. Some 84.04 percent gave social media a pass mark for its impact, while 98.70 engaged in one form of health awareness creation or another through their social media contacts. Overall, 89.67 percent claimed that the information consumed on social media had some impact on them. One of the recommendations is that this impressive performance should be sustained.

Keywords: Lassa fever, social media, epidemic, health, mobilization, infectious, Ebonyi State, Nigeria.

Introduction

Lassa fever is a viral disease that is closely related to the Ebola Virus and monkeypox. The initial discovery occurred in Lassa town in Borno State, Nigeria, in 1969, hence the name. It is a disease transmitted through rats' excrement, especially urine. It is one of the most potent zoonotic diseases that have ravaged the West African sub-region for years. It is now considered an existential threat to Nigeria, Liberia, Sierra Leone, Ghana, Guinea, Central African Republic, and Mali (Smith, Smith, & Adedeji, 2014).

According to the World Health Organization (WHO), from January to April 2018, 1,849 suspected cases were reported from 21 states in Nigeria. Of this figure, physicians confirmed 413, nine classified as probable, 1422 tested negative, and 114 deaths recorded. One of the epicenters of the disease was Ebonyi State. Unlike in the previous incidents in the state, the January 2018 outbreak was unique. First, it was the shortest outbreak ever. Secondly, it was the least severe. Third, the disease's advent was marked by massive publicity and awareness mobilization by the health authorities. Fourth, that was the first time that the youth population was targeted as part of the state government's strategies to contain the disease through its focus on the school system. Fifth, there was a deliberate social media strategy against the epidemic.

For these reasons, the epidemic subsided. This study examines the social media component of the strategy adopted to tackle the problem. It zeroes in on social media utilization in mobilizing the citizens against the disease. This study aims to provide an empirical link between the massive health information dissemination through the various social media platforms and the early containment and control of the Lassa fever outbreak in Ebonyi state in 2018. The attention from WHO, the Nigerian Center for Disease Control (NCDC), and the government to the communication aspect is a significant motivation for the investigation. Besides that, the non-visibility of literature provided the basis to conduct the study.

Statement of the Problem

As of March 2018, about 110 deaths were recorded from the disease in Nigeria sequel to the January outbreak. According to NCDC, Lassa fever is a significant public health issue in the country. There were outbreaks with different severity and fatalities in 2015, 2016, 2017, and 2018. The January 2018 outbreak caused a significant dislocation of social and economic activities in affected states in Nigeria. In Ebonyi State, schools closed for two weeks to minimize the

spread of the disease among students. Despite this severity, the problem was not visible under the scholarship radar as no significant research efforts were directed toward it.

The state government's focus was on intensive enlightenment of the populace to prevent a resurgence of the disease and ensure that they are kept abreast with preventive measures to stop the menace. This work put the "intensive enlightenment" campaign in perspective. It focuses on how digital/social media impacted the early containment of the Lassa fever outbreak in 2018. The social media the citizens of the state relied on for health information, health updates, and preventive measures to halt the disease's spread.

1. What were the dominant social media platforms for disseminating health information and creating public awareness during the Lassa fever outbreak in Ebonyi State in January 2018?
2. Did health information disseminated through social media platforms during the outbreak influence the public's health-behavior change?
3. What impact did social media have in the management, containment, and control of the Lassa fever outbreak in Ebonyi State in January 2018?

Significance of the Study

This study is a timely contribution to public health authorities' efforts to integrate the use of social media platforms as part of the core components of the health protocols designed to fight public health challenges in a cost-effective and timely manner. This paradigm shift to soft-measures to combat public health issues can reduce public health management costs, especially during emergencies. There is a consensus that social media's impact on public health management has not been adequately studied and understood. This work aims to minimize unanimity. This study's significance is also visible by its potential to draw public health authorities' interest and attention to the awareness that early health information provided through social media platforms can mitigate, control, and contain public health challenges.

While vaccines, medicines, and other vital health interventions are necessary, research has shown that behavioral change is an even more effective antidote to the spread of infectious diseases, especially zoonotic infections. In Africa, where many people reside in rural areas, it may be impossible for public health authorities to provide adequate medical coverage. This challenge makes it necessary to incorporate social media platforms' potentials into the fight against such health concerns as Lassa Fever. Thus, the

need for empirical studies to evaluate the role and effectiveness of using social media as part of public health authorities' response measures cannot be over-emphasized.

The empirical gaps in the literature in this critical area of public health management are reducible by studies like this. They give insight into response measures needed to combat public health challenges, especially in Africa. This study's empirical foundation can be useful to public health domain actors, namely, doctors, patients, policymakers, government, journalists, advocacy groups, and Non-Governmental Organizations (NGOs) who appreciate such.

Literature Review and Theoretical Framework

Social media have platforms redefined the public sphere. They have revolutionized the social landscape, democratized the means of sharing information, and afforded the citizens, especially the youth, the wherewithal to exchange opinions, build consensus, contribute to social causes, learn new things, interrogate leaders, and create and connect with their audiences (Griffiths et al., 2015; Sagar, 2013; Gruzd & Roy, 2014; Biondo, 2013; Folayan et al., 2018; Okorie, Loto & Omojola, 2018). Social media platforms' immediacy and spontaneity have made them indispensable in mobilizing the public towards achieving a given cause. In the area of public health, social media are used for "networking and community building purposes, as well as for informing healthcare decision-making between patients and providers" (Stellenfson, Paige, Chaney, & Chaney, 2020, p.1).

According to Griffiths et al. (2015, p.474), "interaction through digital social networks can lead to the identification of problems related to health that the professionals have not yet thought about, and to the contestation of prevailing ideas about health and health care." These media are highly cost-effective in reaching diverse stakeholders such as patients, health authorities, advocacy groups, and health-challenged communities (Scott & Maryman, 2016). They are also available 24 hours a day, elicit an immediate response, require little or no expertise, and have the ability to combine the best qualities of television, radio, telephone, and newspaper all at the same time.

The exponential growth in the number of internet users and the number that utilizes social networking sites has continued to make social media the preferred mobilization channels for governments, corporates, civil society groups, and individuals. The idea of managing public health without digital media is almost unthinkable in the 21st century. Thus, health authorities are gradually integrating them into the planning,

policy, implementation, and management of public health programs and issues (Guo & Saxton, 2013). The W.H.O's Regional Office for Africa (2012) has identified social and digital media as having the ability to provide innovative approaches to community health.

A significant part of the Nigerian government's prevention strategy was to embark on public awareness programs to learn how best to protect their food, keep their environment clean, and kill the rats. Other measures are the following:

1. There was an enhanced surveillance system in all affected states where Lassa fever cases were reported. This measure included contact tracing to track those infected.

2. The line listing of cases reported across all the states and data is stored in the VHF database.

3. Lassa fever treatment centers were established in the affected states to support case management. These centers were equipped with case management, as well as infection prevention and control supplies. The Nigerian newspaper, Daily Trust on January 27, 2016, reported that the partners in this prevention and control measures included WHO, the United States Centre for Disease Control and Prevention (U.S CDCP), the University of Texas Medical Branch (UTMB), and the African Field Epidemiology Network (AFEN).

Aggressive communication strategy through digital media has been one of the significant containment measures against Lassa fever. It is cheaper than other measures, elicits attitudinal change from the public, motivates the public to action, and has a broad reach. Current research on health communication clearly illustrates the powerful influences of communication on health care (Okpoko, 2013, p.47). Communication is especially vital during health emergencies when people need to be abreast of the latest happenings in the theatres of action. Getting the needed information in times of crisis can make the difference between life and death.

During disease outbreaks like the one of Ebonyi state in January 2018, the media took on a vital role between the citizens and the health authorities and act as an essential resource for the needed information, direction, articulation, motivation, and action to counter the health danger among the citizens (Fischhoff, 1995; Salmon & Atkin, 2003; Nicodemus, 2004).

As health communication

continues to evolve, the delivery channels have been altered by the emergence of new and powerful technologies. Moorehead et al. (2013) identify how the new media are being used in public health systems. These include providing information on a range of issues, collecting data on patient experiences, reducing illness stigma, and online consultation. Other authors supported their views (Giustini et al., 2018), adding pharmacy practice and professional development.

The use of ICT for health campaigns has been studied extensively in recent years. The majority of these studies have confirmed the new media effectiveness in achieving intended goals (Oyero et al., 2020; Sulem-Young et al., 2016; Heinderyckx, 2010; Delany, 2009) and getting people involved. Social media subscribers became relevant in intervention systems by reporting new cases or suspected cases directly through the available social media platforms (*WhatsApp*, *Facebook*, and *Twitter*). The other platforms were the toll-free numbers to the state's ministry of health.

According to Fayoyin (2016, p.3), "Africa's health burden is still currently high requiring (among other strategies) the application of innovative communication approaches in delivering the continent's public health agenda." Thus, the various social media platforms are being utilized to provide Africa the e-health services essential to its citizens' improved health. He says that "communication is central to public health delivery, and advances in digital media and communication technology hold significant prospects for addressing public health and development issues confronting the continent." Social media have become indispensable to health authorities and development partners' overall strategies and agencies in providing services that improve public health (Salmon & Arkins, 2003). In 2014, the Ebola virus outbreak hit Nigeria from the neighboring Sierra Leone and Liberia. The outbreak had claimed 8000 lives in Sierra Leone and 7700 in Liberia, but Nigeria only lost 20 people to the disease.

A significant part of the Nigerian health authorities' success was attributed to the extensive and intensive use of social media to mobilize the public and raise awareness about the disease. At the time of the outbreak in 2014, Nigeria had over 130 million mobile phone users, 67 million internet subscribers, and an active social network, which played a significant role. These numbers have almost doubled since 2014. Nigeria now has more than 200 million mobile phone users and 101.2 million internet users, 75 percent of whom subscribe to social media networks. Thus, digital

media's impact in enhancing public health cannot be ignored, especially in a country with one of the highest internet penetrations in the world.

West (2014) reported that the International Federation of the Red Cross (IFRC) was sending out two million messages a day during the Ebola outbreak, which significantly contributed to the public's awareness of the disease, diagnosis, and treatment. Social media deployment for accelerated and extensive information dissemination was singled out as the most instrumental to the outbreak's containment. Mahaer et al. (2014) and Laranjo et al. (2015) found that patients' digital media use resulted in measurable health behavior changes. Recent studies such as Willis, Szabo-Reed, Ptomey, Steger, Honas, Washburn and Donnelly (2016), Balatsoukas, Kennedy, Buchan, Powell, and Ainsworth (2015), and Househ, Borycki, and Kushniruk (2014) showed that positive changes occurred in managing health problems as a result of the impact of social media.

The Lassa fever outbreak in Ebonyi State in January 2018, the events that followed it, and the behavioral patterns of the populace could be theoretically located in both core communication and applied health communication theories.

The Agenda Setting Theory easily comes to mind when the media, both mainstream and social, set the public agenda towards a particular issue (Lassa fever outbreak) and seek to point towards a particular civic action to contain the threat to public health. Although there have been questions about the level of media influence on the public, most agree that the media has some influence. This influence is captured best by the Agenda setting theory. Thus, the media can set the public agenda for behavioral change to counter the effects of the state's Lassa fever outbreak. This time, the actors are not professional news writers but citizen journalists.

The Mobilizing Information Theory (MI), popularized by Lemert et al. (1977), though applied initially in the study of political communication and advertising, has also been found to be applicable in health communication. The theory can explain the media impact in mobilizing information to motivate the public to action and significantly increase self-efficacy towards taking recommended action against the disease's threat.

Information mobilization in the media has been assessed and critiqued by scholars. Lemert et al. (1977) define MI as information that allows people to act on attitudes they already have. This definition agrees with De Silva, Muskavitch, and Roche (2004) and Clarke (2010). They define it as messages that, in theory, allow readers to act on existing attitudes and adopt health-

protective or enhancing behaviors. Thus, community health can be improved when the media provide MI, which acts as motivation for behavior change, adoption of health innovations, and measures to avoid adverse health consequences. Clarke adds that media can directly mobilize action by highlighting a group's cohesiveness in response to a perceived threat. Thus, from a health perspective, such information can encourage and empower people to adopt risk-reducing and health-promoting behavior (Bandura, 2004; Igbinoba et al., 2020; Odiboh, Omojola & Oyesomi, 2020; Adesina et al., 2019).

Lemert (as cited by Clark, 2010, p.13) suggests three levels where MI manifests: locational MI, Identification MI, and Tactical MI. Locational MI provides readers information about the threat's location, while identification MI identifies the health threat. Tactical MI provides the know-how to handle the health threat. These cues help the person under a threatened public health situation like the one under investigation to take actions that would likely ameliorate the situation.

The Health Belief Model (HBM) explains the behavioral changes that occur under a threatened environment, taking into account the health threat, the people's belief system, and the environmental factors under which the threat occurs. This model considers the health concerns that are prevention-related and asymptomatic, where beliefs are as important as or more important than overt symptoms (Okpoko, 2013). The model also considers a person's health behavior or action when that person feels that an adverse health condition can be avoided and that taking a recommended action will eliminate an adverse health outcome. The person may also believe that the recommended action can be adopted. This model thus explains the high awareness of the epidemic's dangers through official health authorities and their social media channels. Although the HBM has been attacked for being too abstract, it has nonetheless found wide acceptability by scholars.

Roger's (1983) Protection Motivation Theory (PMT) has found wide use in health-related communication. It comprises the appraisal of a health threat and the coping mechanism devised for the threat (Westcott, Ronan, Bambrick, &Taylor, 2017). It aligns with the HBM model in significant respects but does not highlight the belief system's aspect so central to the HBM model. Other relevant theories include Bandura's Social Cognitive Theory (SCT) and the Extended Parallel Processing Model (EPPM). These theories are similar in some respects. These include the presence of a perceived threat, the appraisal or

evaluation of this threat, the recommended action to be followed by the public to limit the consequences of the threat, and the perception of the threat as something that individuals can mitigate on their own following the recommended action.

Methodology

This study employed survey methodology and relied on the face-to-face administration of questionnaires to gather the needed data. The study population was based on the 2016 estimated population of Ebonyi State by the Nigerian Bureau of Statistics (NBS) of 2,880,383. More than 500 copies of the questionnaire were distributed purposively to respondents adjudged competent to attend to the listed items. Of this number, 426 (85.2%) returned theirs completed. The copies were shared proportionally across the three senatorial zones of the state. The questionnaire categorized respondents into five age brackets, with 100 copies being shared per age group. The groups are 18 – 24, 25 – 34, 35 – 44, 45 – 54, and 55 and over. Besides the competence factors of literacy and knowledge of the disease outbreak, each respondent also owned a smartphone and subscribed to the social media platforms. The validity profile of the questionnaire was boosted with pre-test exercises on a polytechnic campus. The biodata distribution is in Table 1.

Table 1: Demographic distribution

Age distribution	18 - 24		25 –34		35 – 44		45 -54		55 & above	
Returned questionnaire copies	100		100		96		81		49	
Sex	M	F	M	F	M	F	M	F	M	F
f	61	39	52	48	51	45	53	28	31	18

Analysis and Results

RQ1: What were the dominant social media platforms for disseminating health information during the Lassa Fever outbreak in Ebonyi State in January 2018?

This study's results indicate and confirm the high level of awareness of the Lassa fever epidemic in Ebonyi state during the January 2018 outbreak. Virtually everyone in the state knew of the outbreak, which helped in no small measure to [illegible] the disease's spread and lim 58 consequences considerably compared to the past outbreaks. The data show that most of the respondents got their information about the outbreak from social media. This result confirms findings by Love, Arnesen & Philip (2015), a trend in tandem with the rise of social media in disseminating information, especially in emergencies. We are now in the Net Generation, as surmised by Bernatowicz and Iwaski (2012). Specifically, 73.47 percent of the respondents got their first information about the outbreak from social media. The traditional television, radio, and newspapers combined provided only 23.94 percent of the respondents with their first information about the outbreak. Despite its concerted communication efforts, the State Ministry of Health only provided 0.70 percent of the respondents with their first information about the disease outside its social media platforms. However, some intricacies exist in the figures. Findings show that some respondents did regard the traditional media's online editions (e.g., newspaper) as online even though they were also the same as the printed version.

Furthermore, respondents' information from the state's ministry of health on the outbreak was also from social media platforms, including Twitter. Respondents could also have regarded this as part of the totality of what they received on social media.

Facebook was the most significant source of information on the outbreak to 87.56 percent of the respondents. This outcome aligns with findings by Ali (2017); Aldahmashi, (2017); and Smith (2017) in studies on a similar subject. WhatsApp came a distant second, with 4.23 percent. The majority of the respondents (72.30%) visit social media sites daily, thereby confirming Farhan's (2018) findings that youths spend 30-60 minutes per day on social media, while 19.48 percent visit 2-4 times in a day. The data show that, on average, 97.88 percent of the respondents visit social media sites at least once a day. These figures compare well with Statista's (2018) report that 41 percent of internet users in Nigeria are regular visitors to Facebook and WhatsApp platforms. The rest of the data are in Table 2.

Table 2: ***Mobile phone/internet access and usage***

QS	OPT	18 – 24		25 – 34		35 – 44		45 – 54		55 & above	
		M	F	M	F	M	F	M	F	M	F
Q2		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q3	WW	0	0	1	2	0	2	0	1	0	0
	RD	0	0	5	3	5	4	10	3	7	3
	TV	0	0	3	9	7	8	9	7	3	7
	SM	61	39	43	31	37	29	31	17	17	8
	NP	0	0	0	0	2	0	3	0	4	0
	MH	0	0	0	1	0	2	0	0	0	0
Q4		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q5		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q6		61	39	52	48	46	41	42	21	19	13
		61	39	52	48	46	41	42	21	19	13
Q7	FB	56	33	47	46	44	42	45	21	27	12
	WP	1	2	1	0	3	1	2	4	1	3
	TT	1	2	2	1	0	2	1	0	0	0
	IG	3	2	2	1	1	1	3	1	1	0
	FM	0	0	0	0	3	0	1	1	2	0
	YB	0	0	0	0	0	0	1	1	1	3
	O	0	0	0	0	0	0	0	0	0	0
Q8	MD	50	28	47	44	47	40	26	11	8	7
	AD	4	0	0	0	1	1	5	6	4	5
	TD	7	11	5	4	3	4	22	8	16	3
	OD	0	0	0	0	0	0	0	3	3	3

QS =Questions, NP = Newspapers, TV= Television, FM = Facebook messenger, OPT = Options, MH = Ministry of health SM=Social media, YB = YouTube, WW= Word of mouth, FB = Facebook, TT=Twitter, MD=Many times daily RD = Radio, O=Other media (specify) AD= At least once a day OD=Once in several days, TD= 2-3 times daily WP = WhatsApp IG= Instagram

Q2: Were you aware of the Lassa fever outbreak? / Q3: If yes, how did you

become aware of it? Q4: Do you have a mobile phone? / Q5: Do you have internet access? Q6: Do you visit social media sites? Q7: If yes, which is your preferred site?

Q2: Did health information disseminated through social media platforms during the outbreak influence the public's health-behavior change?

The data show that the respondents were influenced by social media during the outbreak, especially in their health-behavior during the disease's active days. This result contradicts the summation of Eysenbach, Powell, Englesakis, Rizo, and Stern (2004), whose review of 45 papers focusing on social media from 1995 – 2003 found no effect. However, the current data show both influence and influence due to the respondents' actions. This result is significant since taking personal responsibility is essential during health emergencies (Westcott, Ronan, Bambrick, & Taylor, 2017).

Some 89.67 percent of the respondents said their health habits were affected by the information and subsequent awareness created by social media during the outbreak. It was an expected outcome as the state's health authorities emphasized communication and behavioral change as the most effective ways of bringing the situation under control and preventing future occurrences. Fayoyin (2016); Liang and Scamon (2015); and Shim (2013) agree with this strategy, which emanated from W.H.O.

The state's ministry of health came out with four significant control measures on health-behavior change to counter the outbreak's effects. These were: *covering meals and foodstuff always, avoid bush burning to prevent rats straying into homes, killing rats when sighted, and avoiding travels to the affected areas*. More than 52 percent believe that social media made them cultivate the habit of covering their meals as a preventive measure. In comparison, 20.68 percent believed in waging war against the carrier agents. Only 1.31 percent tried to avoid bush burning.

However, the question remains: having been influenced, did they, in turn, influence others through social media? One strategy of the state's ministry of health was to create surveillance teams and make them work as change-agents against the disease. The ministry perfected the strategy by providing toll-free numbers to the communities and making its social media accounts accessible to the people. Thus, 52.62 percent of the respondents discussed on social media with their contacts on how to avoid the disease, while 24.61 percent got involved in other awareness creation discussions. Impressively, most respondents were active in one way or another towards limiting the devastating effects of the disease on the general population. More details are in Table 3.

Table 3: Influence of Social Media

QS	OPT	18 - 24		25 – 34		35 – 44		45 – 54		55 & above	
		M	F	M	F	M	F	M	F	M	F
Q9		61	39	52	48	46	41	42	21	19	13
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q10	CF	29	27	20	27	23	27	19	11	7	9
	AB	0	1	0	1	0	2	0	0	1	0
	KR	17	9	11	9	5	9	12	3	3	1
	AT	14	2	21	11	18	3	11	7	8	3
Q11	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q12	HA	39	32	19	20	25	19	17	12	11	7
	SF	2	0	6	3	6	8	11	4	0	2
	CI	7	2	8	4	3	3	8	2	1	2
	CA	13	5	19	21	7	11	6	3	7	2

Key: CF = Cover my foodstuffs always, HA = How to avoid the disease, AB = Avoid bush burning, SF = Sensitize friends and relatives, KR = Kill all rats in the house, CI = Circulate information about the disease, AT = Avoid travels to affected areas, CA = Create more awareness about the epidemic.
QS 8: How often do you visit this site? Qs 9: Were you influenced in any way about Lassa fever by social media? Qs10: If yes, how? Qs 11: Did you discuss the epidemic with others through social media? Qs12: If yes, what did you discuss?

Q3: What impact did social media have in the management, containment, and control of the Lassa fever outbreak in Ebonyi State in January 2018?

Respondents agreed that social media played a crucial role in managing and controlling the outbreak. Respondents scored social media high in terms of their impact during the outbreak. Table 4 captures the data.

Table 4: Role and Influence of Social Media

QS	OPT	18 – 24		25 – 34		35 – 44		45 – 54		55 & above	
QS 13		M	F	M	F	M	F	M	F	M	F
		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
QS	20%	0	0	0	0	0	0	0	0	0	0
14	40%	0	0	0	1	0	0	0	0	2	1
	60%	17	9	5	2	8	4	2	1	7	1
	80%	41	26	44	43	37	37	34	19	10	11
	100%	3	4	3	2	1	0	6	1	0	0
QS	FB	39	22	37	38	32	26	19	17	11	8
15	WP	19	13	9	7	12	11	17	3	6	5
	TT	1	2	5	1	0	2	2	1	0	0
	IG	1	2	1	2	2	1	4	0	1	1
	FM	0	0	0	0	0	0	0	0	0	0
	YB	1	0	0	0	0	1	0	0	1	0
	O	0	0	0	0	0	0	0	0	0	0

Key: FB = Facebook, FM = Facebook messenger, WP = WhatsApp, YB = YouTube, TT = Twitter, O = others (specify), IG = Instagram
QS13: From your experience, do you think social media played a role in controlling the disease's spread? QS14 If yes, how do you score them on a scale of 20 – 100%? QS15: In your opinion, which particular site played the most significant role?

Table 4 shows that 70.89 percent of the respondents score the social media impact 80 percent, while 13.15 percent rated them at 60 percent. Overall, 84.04 percent believe the impact of social media was at least 60

percent. The social media impact was such a significant factor that none of the respondents rated them below 40 percent of influence. Facebook came tops with 58.45 percent while 23.94 and 3.29 percent went to WhatsApp and Twitter, respectively.

This high rating can be appreciated because social media users are generally more likely to participate in civic duties geared towards controlling the disease (Zhang, Johnson, Setzer, & Bichard, 2010). Again, the youths are known to spend the most time with social media (Steyer, 2009; Farhan, 2018; Olasinde, 2014). They make up more than half of the country's population.

Discussions of Results

The successful early containment and eventual control of the Lassa fever outbreak in January 2018 in Ebonyi state cannot be attributed entirely to the impact of social media. Nevertheless, it is safe to suggest that they played a pivotal role. This suggestion aligns with the findings that the media have paid particular attention to the threat of zoonotic diseases in recent years (Jones et al., 2008; Wobeser, 2006; Westcott et al., 2017). The intensity of media coverage stems from the havoc that the diseases wreak on people's socio-economic lives. Lassa fever, ebola, monkeypox, and bird flu, amongst others, have caused people untold hardship, and currently, they are a global nightmare.

The findings of the current study are also in tandem with Salmon & Arkins (2003), Campbell & Craig (2014), and Shim (2014) that social media have become indispensable for health literacy and health improvement in our communities. Our findings also agree with those of Sawesi, Rashrash, Phalakornkule, Carpenter and Jones (2016), who found that 88.8 percent of respondents rated high the positive impact of social media on health behavior. The findings can also be situated in the World Health Organization's emphasis that communication for behavioral change and innovation adoption by our communities is the most effective public health improvement strategy, especially in developing countries like Nigeria. The implication of this is that if the momentum could be sustained, Lassa fever's threat would ebb or be a thing of the past.

The state's health authorities utilized social media extensively during the outbreak to sensitize the populace about the disease, the carrier agent, and the control measures. This strategy increased self-efficacy, and by implication, what Evensen and Clark (2012) referred to as 'societal efficacy,' making it possible for the public to adopt recommended preventive measures to counter the outbreak.

The closure of the entire school system for two weeks by the government significantly reduced its

ability to spread rapidly within the communities during the disease's peak. This measure was beneficial as the school system consists of the active and highly mobile component of the general population – the youth - who also make up about 60 percent of the entire state population. They are also the most visible users of the internet and social networking sites. This demographic fact helped in spreading the awareness of the disease and the control measures to avoid infections.

When the school system was closed, the Parent Teachers Associations (PTA) became the unofficial reporters of the disease via the WhatsApp groups for schools. Every private school has a PTA WhatsApp platform that discusses the respective school. This medium provided extensive publicity and awareness about the outbreak. It also made it possible to reach the largest population segment most prone to the Lassa fever infection – school children noted or notorious for rat-hunting. These children are also the most likely to drink *garri* - a staple Nigerian food and a noted Lassa fever infection source. They are also the most mobile segment roaming every street and playground and thus easily spread the infection rapidly among the general population.

Social media, especially Facebook, Twitter, and WhatsApp, effectively turned most respondents (with a mobile phone) into a surveillance agent for the disease. The upshot of this is the following information that helped respondents avoid the infection (Gold et al., 2011; Swanton, Allom, & Mullan, 2015; Odone et al., 2015). They were willing to report the spread and go for screening upon manifesting the symptoms. The toll-free numbers provided by the health ministry also helped to make surveillance easy and ensure regular updates from different parts of the state. Because of this full disclosure, fear of discrimination and ostracism, which characterized people's attitude about the disease in the past, was absent in the 2018 outbreak. This development made its early containment possible. In the end, only four persons died during the outbreak, a negligible figure compared to past outbreaks in the state.

In all, these measures combined to make the outbreak the best managed ever in the state with minimal deaths, hospitalizations, and treatment. The results of this study point to the unmistakable impact of social media on health mobilization. Further research is needed to deepen the evaluation and application of the different ways and strategies that social media can contribute to e-Health programs.

Conclusion and Recommendations

Nigeria has 101.2 million internet users as of April 2018. According to the then Minister of Communication,

Adebayo Shittu, 75 percent of these internet users are on social network platforms. Worldwide, Nigeria is the 8th in internet use. *The Guardian* newspaper of January 11, 2017, quoted the Nigerian Bureau of Statistics (NBS) report that Nigeria has a teledensity of 109 percent. These figures are still growing and should be harnessed in deepening health education, health advocacy, innovation adoption, and change management. Therefore, the government, aid agencies, Non-Governmental Organizations (NGOs), and development partners can integrate digital media in their health communication, health intervention, and health implementation strategies in Nigeria. This case study has shown that a lot can be achieved using social media platforms to improve people's health. The following are recommended:

1. We recommend the integration of social media into the government's health response policy at all levels as a means of bridging the physical and geographical gaps between the public health authorities and the general population, especially in times of disease outbreaks. We recognize that the government faces financial challenges in providing the citizens' health needs at all levels. This study has shown that this challenge can be minimized using social media to provide up-to-date and timely health information, significantly commuting the solution from curative to preventive, thereby saving money and promoting behavioral change.
2. We recommend further research efforts on social media's role and application in public health issues, especially in disease outbreaks. This update is needed to equip critical stakeholders with alternative response mechanisms towards improving the people's wellbeing.
3. E-Health is a global, alternative response approach to public health issues. Its adoption by major global health entities such as the World Health Organization and different Centers for Disease Control (CDC) worldwide indicates its importance in public health management. Nigeria, and indeed, Africa, cannot afford to continue to lag. E-Health should, therefore, be accorded high priority by our public health authorities as this study has shown that it can be an efficient and effective response alternative to the management of disease outbreaks and indeed to other public health emergencies.

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