

# YouTube as a Source of Information on Ebola Virus Disease

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## Abstract

**Background:** The current West Africa epidemic of Ebola virus disease (EVD), which began from Guinea in December 2013, has been the longest and deadliest Ebola outbreak to date. With the propagation of the internet, public health officials must now compete with other official and unofficial sources of information to get their message out. **Aims:** This study aimed at critically appraising videos available on one popular internet video site (YouTube) as a source of information for Ebola virus disease (EVD). **Materials and Methods:** Videos were searched in YouTube (<http://www.youtube.com>) using the keyword “Ebola outbreak” from inception to November 1, 2014 with the default “relevance” filter. Only videos in English language under 10 min duration within first 10 pages of search were included. Duplicates were removed and the rest were classified as useful or misleading by two independent reviewers. Video sources were categorized by source. Inter-observer agreement was evaluated with kappa coefficient. Continuous and categorical variables were analyzed using the Student t-test and Chi-squared test, respectively. **Results:** One hundred and eighteen out of 198 videos were evaluated. Thirty-one (26.27%) videos were classified as misleading and 87 (73.73%) videos were classified as useful. The kappa coefficient of agreement regarding the usefulness of the videos was 0.68 ( $P < 0.001$ ). Independent users were more likely to post misleading videos (93.55% vs 29.89%, OR = 34.02, 95% CI = 7.55-153.12,  $P < 0.001$ ) whereas news agencies were most likely to post useful videos (65.52% vs 3.23%, OR = 57.00, 95% CI = 7.40-438.74,  $P < 0.001$ ). **Conclusions:** This study demonstrates that majority of the internet videos about Ebola on YouTube were characterized as useful. Although YouTube seems to generally be a useful source of information on the current outbreak, increased efforts to disseminate scientifically correct information is desired to prevent unnecessary panic among the among the general population.

**Keywords:** Ebola, information, YouTube, videos

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## Introduction

The current West Africa epidemic of Ebola virus disease (EVD), which began from Guinea in December 2013, has been the longest and deadliest Ebola outbreak to date.<sup>[1]</sup> Ebola’s method of transmission makes it amenable to containment by coordinated efforts from the public health community worldwide.<sup>[2]</sup> Those efforts include measures to keep citizens informed to prevent

further spread and undue panic.<sup>[3]</sup> However, with the propagation of the internet, public health officials must now compete with other official and unofficial sources of information to get their message out. In view of these concerns, we attempted to critically appraise videos available on one popular internet video site (YouTube) as a source of information for EVD.

## Materials and Methods

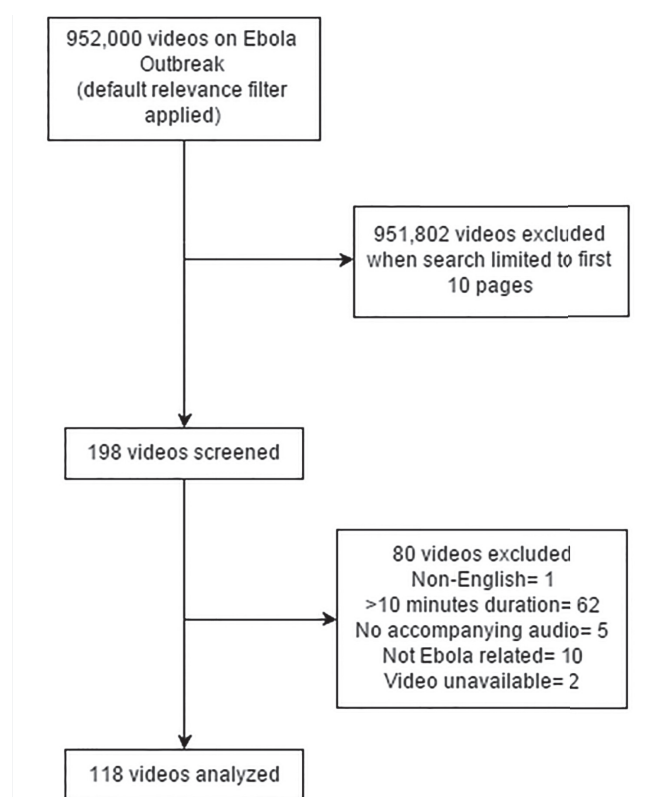
We searched YouTube (<http://www.youtube.com>) for videos using the keyword “Ebola outbreak” from inception to November 1, 2014 using the default “relevance” filter. The term “Ebola outbreak” was selected as the search term after sampling around 50 YouTube videos related to the Ebola outbreak. We included English language videos with primary content

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related to EVD with  $\leq 10$  min duration and restricted the search results to the first 10 pages [Figure 1]. Duplicate videos, videos without accompanying audio or  $>10$  min duration were excluded. Two independent reviewers classified videos as useful (containing scientifically correct information about any aspect of the disease: epidemiology, symptoms, treatment, prevention) or misleading (containing at least one scientifically unproven information, e. g., EVD as man-made conspiracy or depopulation strategy) using a previously validated method.<sup>[4]</sup> We extracted the title, length, number of views, number of likes/dislikes, author and date uploaded for the videos. Video sources were also categorized into seven groups (*viz.* CDC, WHO, Red Cross, NGO/INGOs, academic health institutions/hospitals, news agencies and independent users). Inter-observer agreement was evaluated with kappa coefficient. Continuous and categorical variables were analyzed using the Student t-test and Chi-squared test, respectively. A two tailed *P* - value of  $<0.05$  was considered significant. IBM SPSS Statistics for Windows, Version 21.0 (Armonk, NY: IBM Corp) was used for the data analyses.

## Results

Of the 198 videos screened, 118 videos met the inclusion criteria. 31 (26.27%) videos were classified as



**Figure 1:** Flow chart showing systematic video search and selection process

misleading and 87 (73.73%) videos were classified as useful. The kappa coefficient of agreement regarding the usefulness of the videos was 0.68 ( $P < 0.001$ ). There were no statistically significant differences in the mean number of views, mean number of likes, mean number of days on YouTube between the two groups [Table 1]. The mean length of videos classified as misleading was longer than those classified as useful (6.44 vs 4.11 minutes,  $P < 0.001$ ). Independent users were more likely to post misleading videos (93.55% vs 29.89%, OR = 34.02, 95% CI = 7.55-153.12,  $P < 0.001$ ) whereas news agencies were most likely to post useful videos (65.52% vs 3.23%, OR = 57.00, 95% CI = 7.40-438.74,  $P < 0.001$ ) [Table 1]. Examples of fallacious statements recorded from the misleading videos are given in Supplementary Table 1.

## Discussion

Our study shows that majority of the internet videos about Ebola on YouTube were characterized as useful. The popularity of the videos (as measured by number of views and likes/day) between misleading and useful videos was similar. Studies in the past on the role of YouTube as a source of information for H<sub>1</sub>N<sub>1</sub> influenza<sup>[4]</sup> and immunization<sup>[5]</sup> have found similar results. Most videos uploaded from news agencies contained correct scientific information. The WHO and CDC were under-represented

**Table 1: Detailed characteristics of the misleading and useful youtube videos analyzed**

Video characteristics	Misleading (N = 31)	Useful (N = 87)	P
Mean number of views	38877 (33797)	90787 (234103)	0.47
Mean number of views/day	1089 (1227)	1656 (3947)	0.24
Mean number of likes	398 (372)	580 (2207)	0.46
Mean number of likes/day	15 (24)	10 (29)	0.37
Mean number of days on YT	61.81 (42.29)	67.25 (44.83)	0.55
Mean length of video (min)	6.44 (2.44)	4.11 (2.30)	<0.001
% of independent users	93.55	29.89	<0.001
% of news agencies	3.23	65.52	<0.001
Source	N	N	
CDC	0	0	
WHO	0	2	
Red Cross	0	0	
INGO/NGOs	1	2	
Academic Health Institutions/Hospitals	0	0	
News Agencies	1	57	
Independent Users	29	26	

CDC = Centers for Disease Control and Prevention; INGO = International non-governmental organization; NGO = Non-governmental organization; WHO = World Health Organization; YT = YouTube; N = number

**Supplementary Table 1: Statements recorded from the YouTube videos classified as misleading**

Conspiracy theory, it is not curable  
 Ebola has already spread in the US  
 Airborne spread, without direct contact, this is a new strain that is airborne- government is covering it up- illuminati depopulation plot  
 More people dying from AIDS per day than Ebola in this outbreak  
 Birds, insects may be likely to transmit, can be transmitted to dogs though they are not sick  
 Decoding of Georgia Guide stones inscriptions, concept of depopulating the populated area by with the Ebola virus  
 Depopulation agenda and implementing medical martial law, bio design released by elites  
 Soldiers are trained to shoot zombie during Ebola like emergency drill  
 Ebola has been weaponized, to be an airborne disease  
 Ebola is about power and control, air borne disease and biological warfare  
 It is a psychological operation, airborne Ebola will be released, diagnostic test may be fake unreliable  
 Ebola is airborne  
 It can go airborne, and high temperature and humidity in Africa is limiting Ebola, CIA and US military involvement in testing for biological pathogen as weapon  
 According to CDC next plane could bring pandemic, for the time being there is no active procedure to screen passengers from west Africa  
 It will be end days if the virus became airborne  
 It's 8th plague and written in book of revelation in chapter 15  
 It's not Ebola whatsoever, Ebola outbreak in Africa coincides with meningitis vaccine and CDC 's huge cover up  
 Obama administration engineered this disease, they are allowing plane to enter so that we need to take pill or vaccine, all conspiracy theory coming true now  
 Spread of disease to Europe, Italy, with similar symptoms but new strain  
 The cure and prevention of Ebola is nutrient i.e. Nano silver  
 This is all fear mongering, diagnostic test can be fake  
 Ebola is an airborne virus  
 All efforts to contain the Ebola virus in Africa have failed, Ebola will be shipped into the US, all your protocol measures have failed there so why you going to bring the virus here, they've been wanting an excuse for martial law, what better way to do a little gun confiscation under the guise of quarantine  
 Is it Ebola or is it psychological warfare, Ebola...these monkey viruses were basically toyed with in labs in the 60s...confirmed links with bioweapons, connected to bioweapons research, eugenics...airborne Ebola will be released  
 Spread to a Canadian hospital  
 It can travel by air...right along with an infected passenger  
 The Ebola crisis is fast approaching a point of no return, martial law roundups and detection in quarantine camps is the only option governments have left...similar strategies will be implemented in the United States, Obama signed an executive order...allows apprehension detention...prevent spread of communicable diseases, soldiers training to shoot zombies during an Ebola like emergency drill  
 Ebola epidemic 1.5 million by 2015  
 Ebola is about power control, Obama is allowing for the infection to come by not blocking flights, it creates a militarization environment  
 Biologically engineered?, Use as biological warfare, is this an attempt to infect population with government needles?  
 Ebola did not exist and it was a hoax by the Liberian president to get money  
 6 people are tested in NY but the information is hidden from the public, weaponized to be airborne and it may have already been airborne  
 This year's outbreak linked to eating food contaminated with bat feces  
 Ebola spread through a monkey dealer in Germany, they intend to release the virus at airports and other public places, weaponized version of Ebola  
 Somebody funding a bioweapons lab in West Africa where this apparently came from  
 A study conducted in 2012 showed that Ebola was able to travel between pigs and monkeys without contact, it has been proven many times that you can be infected without direct contact

in the identified video collection (although often quoted in news agency videos) suggesting that those groups do not have immediate primary access to a majority of internet users who use YouTube as a source of information.

### Conclusion

Although YouTube seems to generally be a useful source of information on the current outbreak, official health agencies

should redouble their efforts to disseminate scientifically correct information on Ebola on sites such as YouTube and prevent unnecessary panic among the general population.

### References

1. Briand S, Bertherat E, Cox P, Formenty P, Kieny MP, Myhre JK, *et al.* The international Ebola emergency. *N Engl J Med* 2014;371:1180-3.

2. Gostin LO, Lucey D, Phelan A. The ebola epidemic: A global health emergency. *JAMA* 2014;312:1095-6.
3. Gonsalves G, Staley P. Panic, paranoia, and public health – the aids epidemic’s lessons for Ebola. *N Engl J Med* 2014;371:2348-9.
4. Pandey A, Patni N, Singh M, Sood A, Singh G. YouTube as a source of information on the H1N1 influenza pandemic. *Am J Prev Med* 2010;38:e1-3.
5. Keelan J, Pavri-Garcia V, Tomlinson G, Wilson K. YouTube as a source of information on immunization: A content analysis. *JAMA* 2007;298:2482-4.

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