DISSERTATION SUBMITTED FOR THE MASTER'S DEGREE IN MEDICAL MICROBIOLOGY

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"EBOLA EPIDEMIOLOGY AND NATIONAL CUM INTERNATIONAL SCENARIO-META ANALYSIS"

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BY

Sudhakar Singh

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"EBOLA EPIDEMIOLOGY AND NATIONAL CUM INTERNATIONAL SCENARIO-META ANALYSIS"

A

DISSERTATION

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In partial fulfillment of the requirements for the award of degree of

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In

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By

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DECLARATION OF CANDIDATE

I hereby declare that this dissertation entitles **"EBOLA EPIDEMIOLOGY AND NATIONAL CUM INTERNATIONAL SCENARIO-META ANALYSIS"** is bonafide and genuine research work carried out by me under the guidance of **Dr. Tasneem Siddiqui** Assistant Professor, Department of Microbiology and Co-guide **Dr. Ausaf Ahmad** Associate Professor, Department of Community Medicine, Integral Institute of Medical Sciences and Research, Lucknow.

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This is to certify that research work entitled **"Ebola Epidemiology and National cum International Scenario - A Meta Analysis"** submitted by **Sudhakar Singh, Dr.Tasneem Siddiqui, Dr.Ausaf Ahmad** for ethical approval before the Institutional Ethics Committee IIMS&R.

The above mentioned research work has been approved by Institutional Ethics Committee, IIMS&R with consensus in the meeting held on **19 May 2022**.

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DATE: 15/07/2022 **SUDHAKAR SINGH**

DEDICATED TO TEACHER “FAMILY” & “FRIENDS”

LIST OF TABLES

INTRODUCTION

The Ebola Virus Disease (EVD) outbreak that devastated Liberia, Guinea, and Sierra Leone for much of 2014 and 2015 was a significant and in many respects unheard-of public health calamity. However, the pandemic was also a significant political development that had a global impact. The contribution that scholarship in international relations may make to analysing and comprehending the Ebola outbreak and the worldwide reaction to it is covered in this introduction to the special issue. We organise our remarks into four major themes. Inequalities between and within nations, particularly those relating to gender, resources, and power, as well as the difficulties of a security-driven strategy to global health catastrophes are also explored. The topics of gender, power, and resource inequality, as well as issues of inequality both between and within nations, are covered.The Ebola viruses are the primary cause of Ebola hemorrhagic fever (EHF) and severe Ebola virus disease (EVD) in humans and other primates. One of the most common diseases in the world, EVD is spread by contact with body fluids from infected people or animals. Africa has areas where the ebola virus is endemic. Ebola viruses are characterised by immunological suppression and a systemic inflammatory response that impairs the vascular, coagulation, and immune systems. They primarily target the hepatocytes, endothelium, and macrophage-rich lymphoid tissues. This dysfunction results in multi-organ failure and multifocal necrosis, which is why it resembles septic shock in certain aspects. There isn't yet a specific medication or vaccination approved for use in humans. The main characteristics of Ebola viruses, its pathophysiology, the immune response of the host, and emerging methods for EVD vaccine development are the subject of this paper. 2015 John Wiley & Sons, Ltd. The only known viral family about which we know so little is Filoviridae. We know very little about the diseases that are caused, their aetiology, and specific virology. We do not even fully comprehend the maintenance methods that the agents use in nature. The data obtained during the fight against recent epidemics has given us a lot of fundamental

knowledge about filoviruses. This addition to the Journal of Infectious Diseases was made possible thanks to several colleagues who worked in the lab and the field agreeing to write reports based on recent research. This supplement serves as a single source for significant new, peer-reviewed material. The categories of clinical observations, epidemiology and surveillance, ecology and natural history, virology and pathogenesis, experimental therapy, control, response, prevention, and conclusions have been somewhat arbitrarily assigned to the supplement. This addition to the Journal of Infectious Diseases was made possible thanks to several colleagues who worked in the lab and the field agreeing to write reports based on recent research. This supplement serves as a single source for significant new, peer-reviewed material. Inequalities between and within nations, particularly those relating to gender, resources, and power, as well as the difficulties of a security-driven strategy to global health catastrophes are also explored. The topics of gender, power, and resource inequality, as well as issues of inequality both between and within nations, are covered.

The First Known Filovirus, Marburg

When the Marburg virus first appeared in 1967, biomedical research first learned about the viral family Filoviridae [4]. Commercial laboratory workers were being treated in a Marburg, Germany, hospital at the time for a serious and uncommon illness. Additional instances were reported, and the attending physician noticed the peculiar clinical picture. An examination resulted in the isolation and identification of the virus's direct source as green monkeys transported from Africa for use in study and vaccine development. The outbreak was stopped with just 31 human cases and one generation of secondary transmission to family members and healthcare professionals, some of which had been transported to Frankfurt, Germany, and Belgrade, Yugoslavia. However, the strange virus morphology, the 23% human fatality rate, and the inability to determine the virus' natural

history instilled fear in the hearts of many people worried about the impact of viruses on the global economy. The outbreak was stopped with just 31 human cases and one generation of secondary transmission to family members and healthcare professionals, some of which had been transported to Frankfurt, Germany, and Belgrade, Yugoslavia. However, the strange virus morphology, the 23% human fatality rate, and the inability to determine the virus' natural history instilled fear in the hearts of many people worried about the impact of viruses on the global economy.

Many nations implemented quarantine measures to stop the spread of disease brought in by imported monkeys [5], and tests were implemented to omit the Marburg virus from vaccine substrates [6]. Fortunately, just three Marburg virus recurrences have been discovered, all in travellers in rural Africa, and none of them have resulted in widespread transmission [7-9]. This overview of the Marburg virus's history foreshadows the Ebola virus's extremely similar line of events.

Second The Known Filovirus Is Ebola

Humans First Contact the Ebola Virus in Africa, 1976

The discovery of the Ebola virus [10] as the primary cause of significant outbreaks of hemorrhagic fever in the Democratic Republic of the Congo (DRC) [11] and Sudan [12] astonished the international community once more in the late 1970s. When international scientific teams arrived to deal with these extremely contagious infections, they discovered that transmission had mostly stopped, but they were still able to reconstitute a lot of information from the survivors. Due to the high staff fatality rate, medical facilities have been forced to close, eliminating key hubs for the spread of infection caused by the use of unsterilized needles and syringes and the absence of barrier-nursing procedures. Patients in the impacted areas, on the other hand, were quarantined using

conventional measures, which helped to manage the situation outside the clinics. A lot of the data pertaining to these epidemics has already been compiled [13].

When it became clear that there was only a tiny outbreak in the Sudan in 1979 [14] and one case in Tandala, DRC, in 1977 [15] that human Ebola virus infections were still occurring, the international alarm and research activities that arose in reaction to these outbreaks rapidly faded.

The virus family grows as the Ebola virus travels to the United States.

When Ebola resurfaced in imported monkeys at a primate facility in Reston, Virginia, outside of Washington, DC, in 1989, it shocked us once more. Through 1992, this facility and others had epidemics involving cynomolgus monkeys (Macaca fascicularis), which recurred in 1996 and were detailed in this addendum [18]. Epidemiologic studies [19, 20] carried out in connection with both epidemics were successful in tracing the virus introductions to one exporter from the Philippines but were unsuccessful in identifying the virus's true source. Due to political unrest, attempts to conduct research in the isolated regions where the monkeys were caught have proven to be too risky. Although we are aware that this virus strain (EBO-R) appears to have originated in Asia and is less pathogenic for humans and macaques than other Ebola subtypes [21, 22], we are unsure of its true origin. Nevertheless, the public has been safeguarded by current quarantine laws for imported primates and vaccination requirements [5, 6, 18]. Laboratory research to improve the diagnosis of infections in nonhuman primates was motivated by the containment of these imported virus epidemics in 1989 and the 1990s [2, 23–28]. However, there was a paucity of the materials required to unequivocally prove that these procedures were useful for humans.

The 1994–1996 Ebola epidemics in Africa.

After first showing up in Africa between 1976 and 1979, Ebola hemorrhagic fever (EHF) did not reappear there until 1994. During those fifteen years, was it "gone"? In a sense, no—it was flowing through its natural reserve.

Monitoring for the Ebola virus and increased research into monkeypox were done at the same time between 1981 and 1985 [29]. Although this surveillance may have found multiple cases and calculated the seroprevalence in the population, the results should be interpreted with caution due to issues with the reliability of laboratory tests [27]. Additionally, serosurveillance data from 1995 revealed that there may have been sporadic human infections. Five distinct active locations of Ebola virus transmission were discovered between 1994 and 1996. These sites were Côte d'Ivoire in 1994, the DRC in 1995, and Gabon in 1994, 1995, and 1996 [3, 33–35]. Both the newly identified Côte d'Ivoire subtype (EBO-CI) and the previously identified Zaire subtype (EBO-Z) of the Ebola virus were implicated, and similar to earlier African Ebola virus transmissions, the transmission areas were in or close to tropical forests, such as along riverineSince the discovery of the Ebola virus more than 30 years ago, tremendous progress has been made in understanding the virus's molecular biology and pathogenesis. Despite concerted efforts to answer these questions, the mechanism by which the Ebola virus is maintained and transmitted in nature remains unknown. Recent research suggests that fruit bats may act as a reservoir species, but it is unclear whether other species are involved or how transmission to humans or apes occurs. In nature, two opposing hypotheses for Ebola emergence have emergedSince the discovery of the Ebola virus more than 30 years ago, tremendous progress has been made in understanding the virus's molecular biology and pathogenesis. Despite concerted efforts to answer these questions, the mechanism by which the Ebola virus is maintained and

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EBO-Z is also endemic in Gabon [34], with at least three separate outbreaks in humans and non-human primates [3]. Therefore, Gabon could be another place where risk factors for human infections and natural reservoirs can be investigated. Notable in the epidemic are the important role of dead, naturally infected chimpanzees in the transmission of the virus to humans, the rapid control of transmission to humans when barrier care measures are implemented, and these precautions. It was characterized by the continuous circulation of the virus without it. An outcrop in the deep forest of the proband.

EBO-Z, Kikwit, Democratic Republic of the Congo, 1995

Since the description of Africa's major EHF outbreaks in 1976 was mostly based on information from the past, the Kikwit epidemic offered a better opportunity for more thorough research while the epidemic was still active. There were further variations. For instance, the 1995 Kikwit press coverage and the tabloid response were utterly unanticipated. This epidemic's final few weeks were covered by genuine reporting and tabloid exploitation in a way that was never before seen.. There was great public interest in both media-generated and false information, primarily due to the great success of Richard Preston's book The Hot Zone [39]. Fortunately, hard-working mainstream journalists are honest in disseminating the best scientific information, and the World Health Organization (WHO) has become a very powerful center for disseminating credible facts about epidemics [40]. Large donations were sent to WHO and directly to the Democratic Republic of the Congo. However, there were difficulties in paying relief supplies and resources, procuring appropriate materials, and reviewing donations……..

Between April 2018 and November 2020, the 11th outbreak of Ebolavirus disease (EVD) occurred in the Democratic Republic of the Congo (DRC). Regular cross-border exchanges between Tanzania and the Democratic Republic of the Congo through regular visitors, traders and refugees are of concern given the potential for further expansion to neighboring countries. This study aims to assess the risk of introducing EVD from the Democratic Republic of the Congo to Tanzania. Analyzing national data on DRC to Tanzania flight, boat and vehicle transportation schedules from May 2018 to June 2019, explaining population migration by land, port and air, and available surveillance data In combination with, we assessed the risk of EVD entry into the model. Crossing the border was considered the most common mode of transportation and the most likely route to bring EVD from the Democratic Republic of the Congo to Tanzania. The high likelihood of EVD

being introduced from DRC to Tanzania via the assessed route was associated with pathogen survival and poor detection at the port of entry. This study provides important information on the risk-contributing factors associated with the introduction of EBV in Tanzania. It also notes that mitigation strategies, including border surveillance, need to be strengthened, as infected individuals arriving by land are most likely the route of entry for EBV.

In many respects, press practice is still rooted in the traditional model of dissemination of scientific information or dissemination of science (eg Schäfer, 2011; Summ et al).

Volpers, 2016). This article describes the analysis of information visualization, which has great potential to disseminate scientific and technical knowledge. In particular, find out what role they played

Dissemination of the last Ebola expertise (technical-biomedical aspects)

Virus epidemic in Spanish reference press. Conakry, Guinea saw an Ebola virus disease (EVD) pandemic in December 2013.

The most destruction had ever occurred. The virus then spread to other African nations before making its first appearance in Europe after its discovery in 1976. 2014-08-07 in Spanish

The sick missionary Miguel Pahares was returned to his home country by the government. Pajares was being cared for by Theresa Romero at the Carlos III Hospital in Madrid when she fell unwell.

he became the first person infected with the virus in Europe. Since the discovery of the Ebola virus more than 30 years ago, tremendous progress has been made in understanding the virus's molecular biology and pathogenesis. Despite concerted efforts to answer these questions, the mechanism by which the Ebola virus is maintained and transmitted in nature remains unknown. Recent research suggests that fruit bats may act as a reservoir species, but it is unclear whether other species are involved or how transmission to humans or apes occurs. In nature, two opposing hypotheses for Ebola emergence have emerged.

AIM & OBJECTIVES

AIM:

The overall aim of ebola is to develop and deliver rapid and bedside diagnostic tool that will significantly increase our capacity to capacity to handle the current ebola virus disease in west Africa and also future out break in within a 24 month period.

OBJECTIVES:

My main objective is to study the transmission of human ebola virus by analysis of current and old epidemiology situation across the different states of India and across theworld.

REVIEW OF LITERATURE

Information visualisation, often known as visualisation, is the broad term for any visual representation used to communicate, analyse, explore, and find patterns in data (Cairo, 2016). It is a unique form of "functional art," fusing words and visuals to various degrees of abstraction (Cairo, 2013). Information visualisation, specifically in the context of journalism, is a potent and practical instrument for creating events or phenomena and making them understandable using both figurative and non-figurative visuals (illustrations, pictures, drawings, diagrams, maps, etc).

Classification of information visualizations-

In December 2013, there was a pandemic of the Ebola virus disease (EVD) in Conakry, Guinea.

The biggest devastation had ever taken place. After being discovered in 1976, the virus then spread to other African countries before making its debut in Europe. 7 August 2014 in Spanish

The authorities sent Miguel Pahares, a sick missionary, back to his native country. Theresa Romero was taking care of Pajares when she became ill at the Carlos III Hospital in Madrid.Additionally, the Lester (2006) typology has been adopted and modified. To distinguish between "statistical infographic elements" and "non-statistical infographic elements" is his main goal. In order to highlight data trends that can be missed by readers if provided solely verbally, the first series of visuals comprises a scale that incorporates clear and understandable numerical information.

Epidemic diseases in the mass media-

Medical and health-related issues have dominated public discourse on science since the 1980s (Bauer, 1998). In recent years, academics have grown increasingly concerned about the public attention that newly emerging infectious diseases that occasionally cause epidemics receive. Along with the HIV/AIDS epidemic, the H5N1 avian influenza pandemic, the H1N1 influenza pandemic, and the SARS epidemic, the EVD outbreak has

received the majority of media attention (Mayer and Pizer, 2005; Lee and Basnyat, 2013; Wagner-Egger et al., 2011). (See Wallis and Nerlich, 2005; Lewison, 2008; Ding, 2009).The difficulty with EVD includes technical-biomedical (epidemiology, vaccine development), socio-economic (costs of prevention and research, adverse effects on the afflicted communities), and political (resource allocation, expenditure on vaccines and treatments), similar to other epidemics (Hellsten and Nerlich, 2010). 11,000 people died as a result of the most recent Ebola pandemic, which caused a public health disaster and had severe socioeconomic repercussions for the affected African nations. The assignment of blame to the various administrations involved in the political management of the crisis in the Spanish case, as well as the socioeconomic effects of the health alert, were at the time heated subjects in the news.

Other technical-scientific issues communicated through the use of graphic aids- The importance of visual aids other than images in the news coverage of other technical-scientific topics has not received the attention it deserves from many research. In the British (Smith and Joffe, 2009), Canadian (DiFrancesco and Young, 2010), and US newspapers (Rebich-Hespanha et al., 2015), some authors have examined the impact of visual aids to the popularisation of scientific information on climate change. Likewise, it has been shown that infographics contain messages that are more discouraging than those that do not use visuals when conveying environmental facts (Lazard and Atkinson, 2015).

Numerous studies in the field of health risk communication in general (e.g., Ancker et al., 2006; Garca-Retamero and Cokely, 2013; Lipkus, 2007; Stone et al., 2015) and in relation to breast cancer risk in particular, concentrate on the impact of graphic representations on audiences (Occa and Suggs, 2016; Schapira et al., 2006). Rarely are graphical tools for sharing pandemic information described in literature. Interactive maps' impact on the public's perception of the H1N1 flu pandemic has been studied by Wong et al (2013). Shin (2016) examines the information graphics that news outlets and health organisations are employing to disseminate information about the outbreak.Additionally, the Lester (2006) typology has been adopted and modified. To distinguish between "statistical infographic

elements" and "non-statistical infographic elements" is his main goal. A general term used to describe any visual representation is sualisation.

Data suggest that the incubation and latent periods may differ, and that distinguishing between the two periods may improve mathematical models.

Key words

Ebola, latent period, incubation period, transmission, systematic review

Topic: exposureebola virus diseaseinfectionsincubation periodmathematical model

Direct contact with bodily fluids from an infected patient can lead to the spread of the Ebola virus to other people. The incubation period typically lasts 5 to 7 days, and around 95% of people have symptoms within 21 days of exposure. Typical symptoms include fever, intense exhaustion, diarrhoea, abdominal pain, cramps, nausea, and vomiting that lasts three to five days—and frequently even longer. It is possible to experience laboratory problems such thrombocytopenia, severe lymphocytopenia, and elevated aminotransferase levels.

Hemorrhagic fever affects less than half of patients and is most commonly found in the gastrointestinal tract. A rising IgM or IgG titer (fourfold) contributes to a strong presumptive diagnosis. Neither a licenced vaccine nor an approved treatment is currently available for human use.

Among the therapies in development are passive transfer of serum collected from Junin virus or Lassa virus survivors, equine IgG product from horses hypervaccinated with Ebola virus, a "cocktail" of humanized-mouse antibodies

(ZMapp), recombinant inhibitor of factor VIIa/tissue factor, activated protein C, RNA-polymerase inhibitors, and small interfering RNA nano particles.

Several vaccine candidates are also undergoing preclinical testing. One vaccine is a chimp adenovirus vector vaccine, while others use replication-defective adenovirus serotype 5 and recombinant vesicular stomatitis virus. Oral nonsteroidal anti-inflammatory drugs and opioids are commonly used to treat pain.

These drugs are hazardous and have resulted in numerous hospitalizations and deaths. It is far safer to treat pain, even severe pain, with plant-based topical preparations. To relieve pain, topical preparations must contain compounds that penetrate the skin and inhibit pain receptors such as transient receptor potential cation channels and cyclooxygenase-2. Inhibiting pain in the skin disrupts the pain cycle and avoids exposing internal organs to toxic compounds. Topical pain relievers have the potential to save many lives, reduce medical costs, and improve therapy. The report on Toxocara infection in gardeners is fascinating[1].

According to Esquivel et al., "gardeners do not have a higher risk of Toxocara infection than the general population in Durango City, Mexico"[1].

In fact, given the source of infection of Toxocara, anyone who comes into contact with it may be at risk. Gardeners may come into contact with soil as part of their job. In fact, everyone must come into contact with soil, and the gardener does not spend the entire day in the garden, but only a portion of it.

Furthermore, the Toxocara can be found in a variety of settings, including the public yard[2] and the hospital yard[3]. According to a recent study by Cassenote et al., "infection as a reflection of family hygiene habits" [7

Ebola virus (EBOV) and Marburg virus (MARV), both members of the Filoviridae virus family, are emerging and re-emerging zoonotic pathogens that cause acute hemorrhagic fever in humans with a high case fatality rate (up to 90%)[1].

A person can contract the Ebola virus by coming into close contact with bodily fluids from an infected patient. The incubation period normally lasts 5 to 7 days, and 95% of patients develop symptoms within 21 days after encounter. Fever, extreme tiredness, diarrhoea, abdominal discomfort, cramping, nausea, and vomiting that lasts three to five days—and usually even longer—are the most typical symptoms. Lab issues could include elevated aminotransferase levels, severe lymphocytopenia, and thrombocytopenia. The worst one to date occurred in the Gulu District of Uganda in 2000–2001, and it was caused by the Sudan virus. (SUDV). This outbreak produced 425 cases, 216 of which were laboratory confirmed, with a case fatality rate of 53% .

The Ebola strain currently circulating in West Africa shares 97 percent of the genetic makeup of the Zaire Ebola virus isolates seen in Gabon and the Democratic Republic of the Congo.

Although this strain's case fatality rate is currently under 60%, historically it has had the highest mortality rates (90%) [3].

The EVD pandemic began in Guinea in December 2013[2], and the World Health Organization (WHO) was formally informed of an EVD outbreak that was rapidly expanding on March 23, 2014.

This epidemic was classified as a "public health emergency of worldwide concern" by WHO in August 2014[3]. In Guinea, Liberia, and Sierra Leone, the case fatality rate was the same at 70.8 percent (95 percent confidence interval (CI), 68.6 to 72.8) in mid-September 2014 among patients who had gotten conclusive results. Although the present estimate is only based on 11 recent instances, Nigeria's case fatality rate was lower at 45.5%.The in-hospital case fatality rate was 64.3 percent (95 percent confidence interval (CI), 61.5 to 67.0), which was lower than the rate for all patients with definitive outcomes, and this rate was consistent across countries. Health care workers died at a rate ranging from 56.1 percent (95 percent CI, 41.0 to 70.1) in Guinea to 80.0 percent (95 percent CI, 68.7 to 87.9) in Liberia.

Even with widespread and multisectoral interventions, each week saw an increase in the number of new cases and fatalities[4]. More than 20,000 Ebola cases are projected to have been confirmed and suspected by November 2, 2014, in Guinea, Liberia, and Sierra Leone, respectively. The strategies for combating this outbreak remain unchanged [4].

In most incidents, victims range in age from 15 to 44. (49.9 percent male). According to reported morbidity and fatality rates, the current EVD pandemic is significantly more severe than all previous outbreaks combined. There's a good chance that a lot more people than that were actually infected and killed[4].

. This time, the outbreak has grown so large that the three most affected countries, Guinea, Liberia, and Sierra Leone, face numerous challenges in implementing rigorous control measures at the scale required to prevent transmission and provide clinical care to all EVD patients[4] Viruses that cause Ebola.

The Ebolavirus genus is divided into five viruses: SUDV, Tai Forest virus, Reston virus, EBOV, and Bundibugyo virus. EBOV, which causes EHF, has the highest fatality rate in humans (57 percent -90 percent), followed by SUDV (41 percent -65 percent) and Bundibugyo virus (40 percent). Tai Forest virus has only been linked to two nonfatal human infections, whereas Reston virus causes asymptomatic infection[5, 6].

The viral hemorrhagic fevers (VHFs) are a group of different animal and human diseases caused by RNA viruses from four different families: Arenaviridae, Filoviridae, Bunyaviridae, and Flaviviridae.

The severity and clinical symptoms of VHFs can vary greatly depending on a variety of factors, including: the type of causative agent, as well as the epidemiological and clinical characteristics of the host In general, all patients have fever and coagulation abnormalities, which can lead to disseminated intravascular coagulation, multiple organ failure, shock, and death.

The VHF can be severe and life-threatening, and it can appear as isolated cases, such as those imported from endemic areas, or it can cause a lethal outbreak.

Human sporadic and outbreak cases with high case fatality rates have been reported, causing social and economic disruption[7].

Filoviruses are enveloped particles with a single-stranded, negative-sense RNA genome that is non-segmented and approximately 19 kb in size. The genomes of EBOV and MARV encode seven structural proteins, as well as two nonstructural soluble glycoproteins (GP): soluble GP and small soluble GP. All known MARV strains are of the same species, Lake Victoria marburgvirus, whereas EBOV strains are made up of four distinct species: Zaire ebolavirus (ZEBOV), Sudan ebolavirus (SEBOV), Côte d'Ivoire ebolavirus (CIEBOV), and Reston ebolavirus (REBOV).

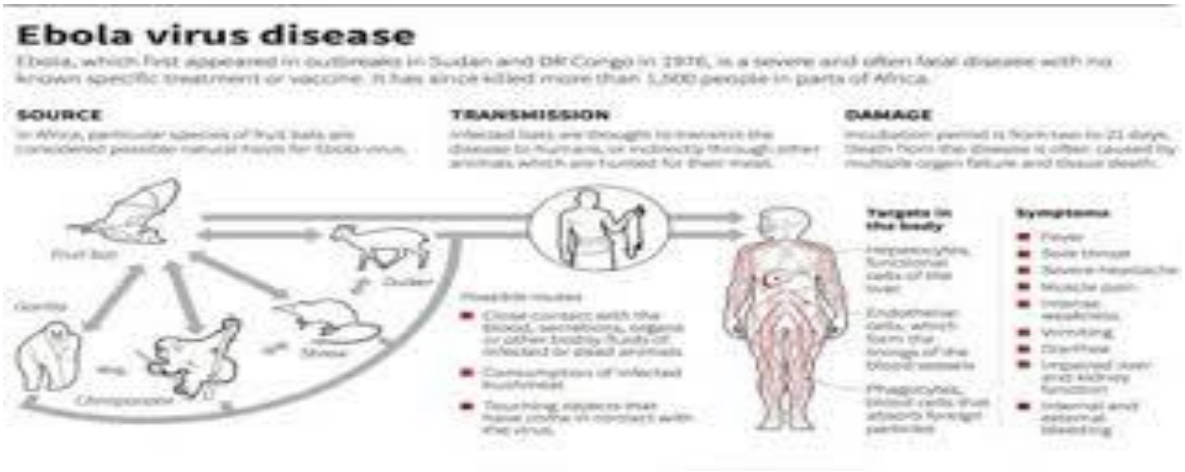
The fifth species has been proposed as the newly discovered Bundibugyo ebolavirus (BEBOV). The species differ in their apparent pathogenicity in humans; ZEBOV is the most pathogenic (up to 90% case fatality rate), followed by SEBOV (approximately 50% case fatality rate), and BEBOV (approximately 50% case fatality rate) (approximately 40 percent case fatality rate). CIEBOV and REBOV cause lethal infections in nonhuman primates but have not yet been linked to fatal human cases.

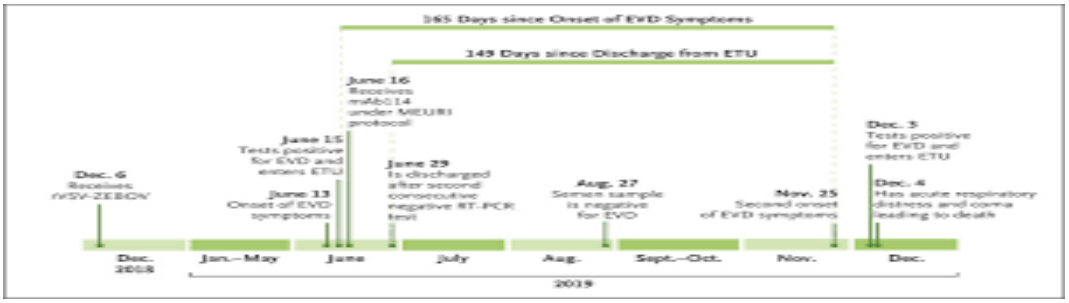
EHF is thought to persist in a reservoir species found in endemic areas. Apes, humans, and possibly other mammalian species that are susceptible to Ebola virus infection are regarded as end hosts rather than reservoirs.

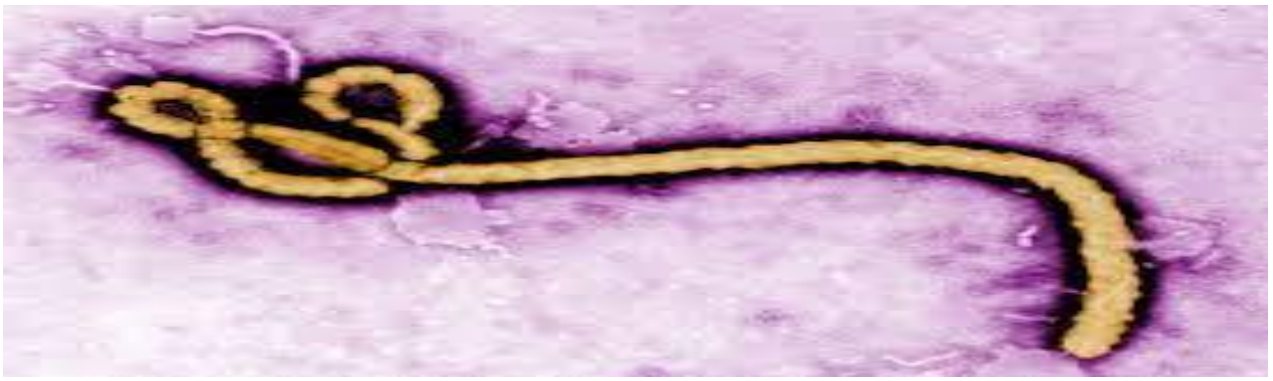
Despite extensive efforts to identify natural reservoirs in large EHF outbreaks, no potential hosts or arthropod vectors have been identified. Rodents and bats have long been thought to be potential reservoir species. not be realized[9, 12] Ebola virus disease (EVD) has a high mortality rate, particularly among newborns.

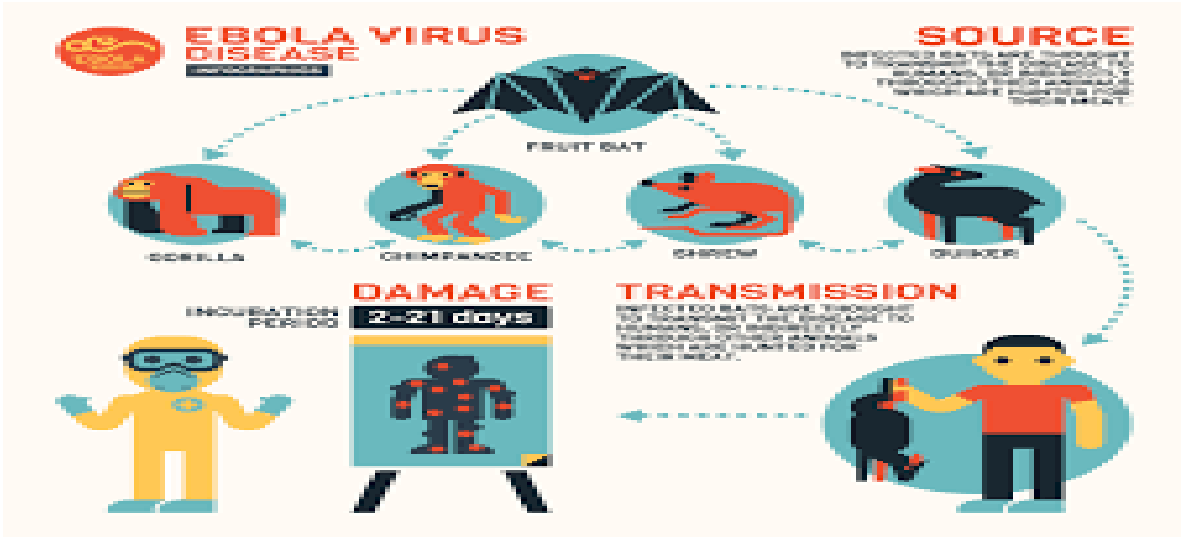
Because there is a scarcity of literature on live neonates born to EVD pregnant women, our understanding of their clinical illness and outcomes is extremely limited. A search of the literature was conducted to find descriptions of live neonates born to pregnant women with EVD. To date, five reports have provided limited information about 15 live neonates born to EVD pregnant women.

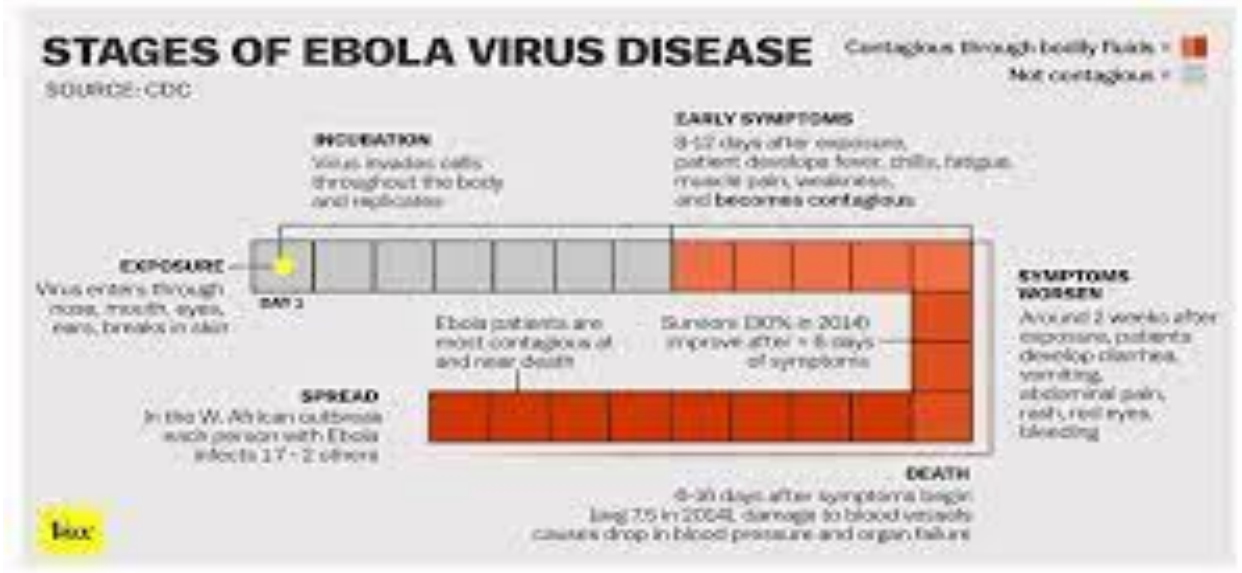
For those in the know, all 15 infants died within 19 days of their birth. Eight (67%) of the 12 newborns with known symptoms and indications were found to have fever; no other symptoms or indicators were found. There are no published resources that describe the clinical trial. More information on neonates with EVD is urgently needed, including information on their clinical course (such as disease onset and presentation, symptomatology, and illness course), therapies used, and the amount of Ebola virus present in their mothers' breast milk who are Ebola-positive or in remission.








EBOLA VIRUS DISEASE
SOURCE
FRUIT BAT
DAMAGE
INCUBATION PERIOD
2-21 days
TRANSMISSION


STAGES OF EBOLA VIRUS DISEASE
SOURCE: CDC
Contagious through bodily fluids
Not contagious
INCUBATION
Virus invades cells throughout the body and replicates
EARLY SYMPTOMS
8-12 days after exposure, patient develops fever, chills, fatigue, muscle pain, weakness, and becomes contagious
EXPOSURE
Virus enters through nose, mouth, eyes, ears, breaks in skin
DAY 1
Ebola patients are most contagious at and near death
Survivors (80% in 2014) improve after ~ 6 days of symptoms
SYMPTOMS WORSEN
Around 2 weeks after exposure, patients develop diarrhea, vomiting, abdominal pain, rash, red eyes, bleeding
SPREAD
In the W. African outbreak each person with Ebola infects 1.7 - 2 others
DEATH
6-16 days after symptoms begin (avg 7.5 in 2014); damage to blood vessels causes drop in blood pressure and organ failure
Vox

						Incubation Period	
Author	Reference	Outbreak Location	Year	Species	Exposure Type	Value ± SD or (Range), Days	N
Incubation period, percutaneous transmission							
Breman et al; International Commission	[9, 13]	Zaire	1976	*Zaire ebolavirus*	Contaminated needle injection	6.3 ± N/A (range 1–15)	57
Emond et al	[14]	Porton Down, England	1976	Not specified (*Zaire ebolavirus* or *Sudan ebolavirus* inferred)	Needlestick	6 ± N/A	1
Heymann et al	[15]	Tandala, Zaire	1977–1978	*Zaire ebolavirus*	Laceration	12 ± N/A	1
Khan et al	[16]	Kikwit, DRC	1995	*Zaire ebolavirus*	Contaminated needle injection	3 ± N/A (range 1–6)	11
Mean incubation period (percutaneous route)[a]						5.86 ± 1.42	70
Incubation period, person-to-person transmission							
Breman et al; International Commission	[9, 13]	Zaire	1976	*Zaire ebolavirus*	Single contact	2 ± N/A	1
Bwaka et al	[17]	Kikwit, DRC	1995	*Zaire ebolavirus*	Direct HCW contact	6.2 ± N/A (range 5–8)	5
Bitekyerezo et al	[18]	Mbarara, Uganda	2000	*Sudan ebolavirus*	Crowded accommodation contact	7 ± N/A	1
Leroy et al	[19]	Ndongo, DRC	2007	*Zaire ebolavirus*	Washed corpse	8 ± N/A	1
Incubation period, animal-to-person transmission							
Baize et al	[20]	Mayibout, Gabon	1996	*Zaire ebolavirus*	Consumed chimpanzee (decedents)	7.8 ± 0.9	12
Baize et al	[20]	Mayibout, Gabon	1996	*Zaire ebolavirus*	Consumed chimpanzee (survivors)	8.4 ± 1.3	5
Mean incubation period (non-percutaneous route)[a]						7.34 ± 1.35	25
Incubation period, unknown route of transmission							
Richards et al	[21]	Gabon/Johannesburg, RSA	1996	*Zaire ebolavirus* (inferred)	Assisted in CVC placement	3 ± N/A	1
Mean incubation period (all routes of transmission)[a]						**6.22 ± 1.57**	**96**

In the more than 30 years after its discovery, our knowledge of the molecular biology and pathophysiology of the Ebola virus has significantly increased. It is currently unknown how the Ebola virus is maintained and propagated in the wild, in spite of intensive research into these concerns. Although it is unknown whether other animals are involved or how the virus is transmitted to people or apes, a new study suggests that fruit bats might act as a reservoir species. There are two opposing hypotheses regarding how the Ebola virus first appeared in nature.

MATERIAL AND METHODS

A content analysis of the entire population was conducted to answer the questions in the survey.

Visualization of information on previous technical biomedical questions regarding Ebola

Trends in Spanish reference presses (El País, El Mundo, La Vanguardia, ABC, El Periódico). The investigation period continued from March 22, 2014 (when Guinea Conakry officially declared this).

Until January 13, 2016 (when officially announced by WHO), there were outbreaks in Japan.

The end of the epidemic). Using the newspaper database above, all journalism texts

I checked the keyword "Ebola" and extracted the ones containing graphics. After excluding these.

Text with illustrations unrelated to the technical and biomedical aspects of the epidemic.

Article), 93 received. 43% (n = 40) of articles use only one visual representation (eg line chart) and 57% (n = 53) use multiple (eg, bar charts, structural diagrams, and).

Fact Box) We used the visualization of personal information as the unit of analysis. as a result,

The total population of visualizations of the analyzed information was N = 209 (40 individual visualizations)

And 169 are integrated into the infographic). Developed using inductive and coding sheets with relevant research categories

Deductive integral approach. After reviewing the existing literature, we conducted a pilot study with random samples.

Information visualization (n = 50) has been performed. This hybrid approach makes it easier to define .

There are two important groups: (1) Identities at a basic level (date, newspaper, section, genre, and).

Source) and (2) individual characteristics of visualization of each piece of information (syntactic structure)

Graphic titles, references in text to graphic content, typical characters in images, types of visual depiction, as well as different technological biological materials). The author was one of two independent coders who coded every category, but the intercoder

The application of the index was restricted to the unexplained categories (the second set of categories). master's candidate

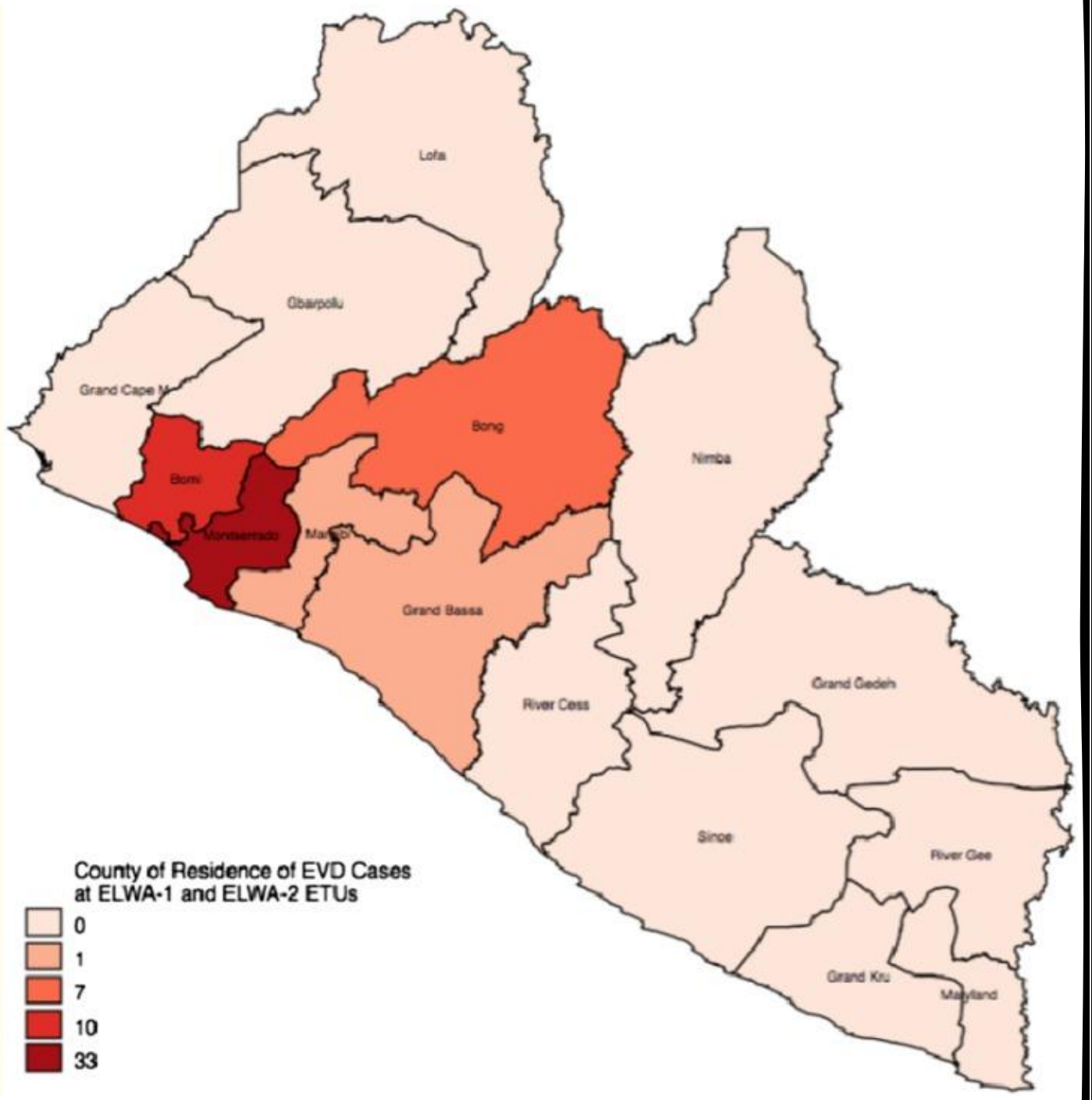
The assistant obtained instruction in coding. Unification meetings were scheduled on a regular basis for three months.

gives standards and assistants the opportunity to become familiar with codebooks, research goals, and queries. The intercoder's dependability was evaluated using.

Krippendorff's Alpha, a well-known metric in communication research (Krippendorff, 2011).

consistency The coefficient 0.80>0.67 indicated that the result should be viewed with suspicion even though 0.80 was thought to be reliable (Krippendorff, 2013). You should store the following alpha values: Type of visual representation (A = 0.83), Type of technical biological content (A = 1), Type of graphic content (A = 0.87), Heading syntactic structure (A = 0.87), Text reference to visual content (A = 0.74), Text reference to features of picture representation (A = 1), and Statistical Analysis & Graphical representation

Statistical Analysis & Graphicalrepresentation:-



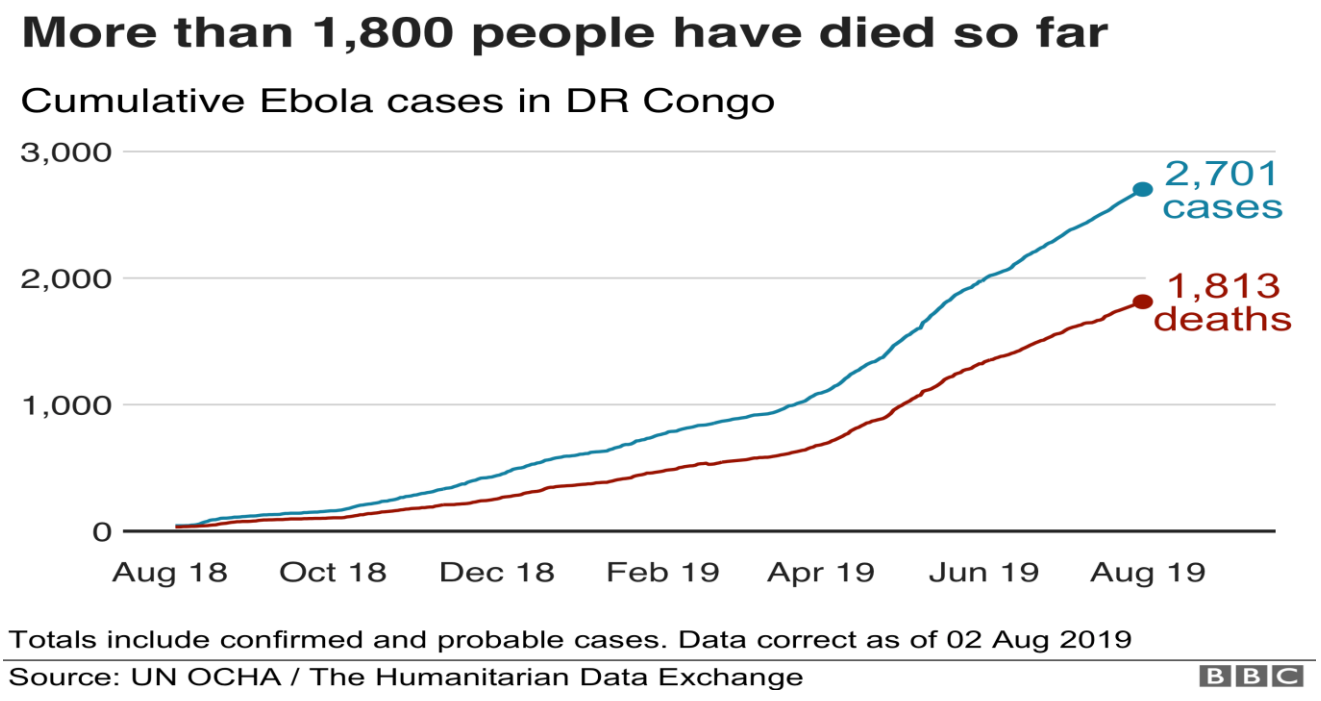
All analyses were performed in MATLAB (MathWorks, Natick, Mass.). To take into consideration point estimates obtained from observation-weighted literature, the normal distribution should be adjusted as necessary. To calculate the incubation period, the average amount of time between the onset of dry symptoms and the onset of wet symptoms was

included. The variance of this composite value was calculated using the sum of the variances.

Sensitivity analysis was performed. This investigation includes studies that provided estimates of the incubation time based on exposure for a certain number of days or on exposure of an unspecified type and duration. We also performed a sensitivity analysis to determine the duration of the infection, assuming that the infectivity ended when the plasma viremia decreased.

Ebola is a lethal viral hemorrhagic infection with the potential to spread widely. Using two sets of data, we examine the 1995 outbreak in the Democratic Republic of the Congo (onset and death data). Numerical simulations show that the model fits observed death data in 98.5 percent of cases and observed Ebola onset data in 99.95 percent of cases.

When Bayesian inference cannot be performed analytically for complex models, the Markov Chain Monte Carlo algorithm is used as a backup strategy. The outcomes of both approaches a.



METHODOLOGY

AREA OF STUDY: Sudan,West Africa,sierra,leon,Liberia,Nigeria.

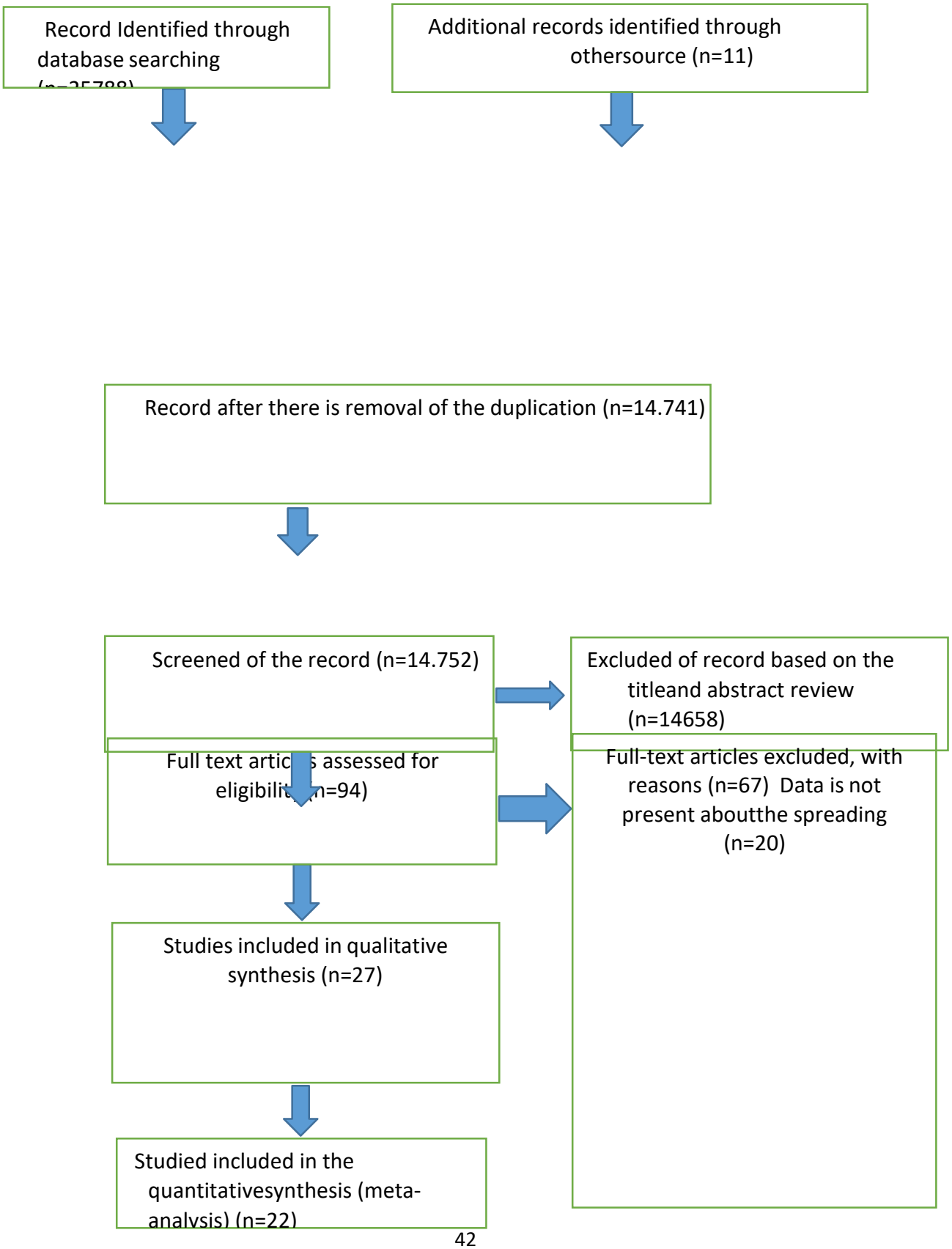
Data Type: Basically, I used secondary mode of data collection.

A. Collection of data from various journals.
B. There is a collection of some data from books.
There is a review of literatures and article from various online sources.

Research tool: Collection of secondary data from the report published in different articles.

Time frame-From 1976 to 2012. Search engine:
Pub med, Ind. Med, Google scholar.

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Criteria).



RESULTS & OBSERVATION

Results: A total of 31 papers were chosen from 6552 total reports. Eight studies assessed the risk of acquiring a filovirus infection, and 23 other studies reported anecdotal evidence indicating the most likely mode of transmission. Numerous forms of contact—including talking, eating together, sleeping together, and direct or indirect touching—were unlikely to spread the illness in the early stages of illness or during incubation. Household contacts who reported directly contacting a case had a 32 percent assault rate (95 percent confidence interval (CI) 26-38 percent). The likelihood of sickness transmission among household members without direct contact was very low (1 percent ; 95 percent CI 0–5 percent). Participating in traditional funeral rites and providing long-term care for a patient in the community were strongly linked to the development of disease, most likely as a result of stress.

Meta-analysis of the contact history

Species	Outbreak date, location, authors	Type of information relevant to this review
BUDV	Aug–Dec 2007, Bundibugyo Uganda [38]	Delayed recognition; unconfirmed, risks of attending childbirth
	Aug–Dec 2007, Bundibugyo Uganda [27]	Numerical risk ratio data, various attributes, OR
MARV	1967, Germany and Yugoslavia [17,21]	Documents transmission of disease from sexual contact
	Feb–Mar 1975, Johannesburg South Africa [85]	Likely transmission moment = handling wet paper tissues from bereaved incubator
	Mar–Jul 2005, Uige, Angola [26]	OR data
SUDV	31 Jul–6. Nov 1979, Nzara, Yambio, Sudan [25]	34 patients, concentration in blood, one OR + anecdotal, during & after illness
	Aug 2000–Jan 2001, Gulu, Uganda [22]	PPRs, fomites suggested, many factors
	Aug 2000–Jan 2001, Gulu, Uganda [40]	Children under 18 survive better, close contact risk

EBOV	1 Sep–24 Oct 1976, Bumba, Yambuku, Zaire [11,19]	ORs (also in Breman *et al.*) Non-intimate contact risk, touching dry skin, sexual partners, attending childbirth or a funeral, intimate funeral tasks, needle sharing, bedbugs, rats?
	1976–77, Sud-Ubangi subregion, Zaire (Tandala) [12]	1981–85 surveillance report: direct contact implicated, asymptomatic, antibody prevalence
	Jan–Jul 1995, Kikwit DRC [24]	PPRs, not recognized until May 1995; households of 27 cases interviewed 17 May–3 June about risk factors (no risk after 1 May); stage of illness relevance
	Apr–May 1995, Mosango DRC [28]	Related to Kikwit outbreak, 23 only in Mosango; forms of dangerous contact
	Jan-Jul 1995, Kikwit DRC [23]	Matched ORs
	1994–96, Gabon [29]	Occupation and economic activity
	2002–03, Rep. of Congo [35]	Cases linked to direct contact between people following primary contacts with wildlife
	2005, Etoumbi DRC [41]	Gender factors, funerals, cremation controversy
	May–Nov 2007, Occidental Kasai, DRC [37]	Suggests via sweat, dead animals
	2014, Sierra Leone [39]	Transmission after caring for ill patient, organizing funeral, caring for infant or attending during childbirth

	2014, Sierra Leone patient taken to Germany [36]	Believed transmission in office or lavatory; high levels of virus detected in sweat
	2014, Sierra Leone [34]	Funerals, health care workerss affected; people who left clinic but had EVD after all
	2014–15, Sierra Leone [32,45]	Touching bodies at funerals, contact with or caring for patients, touching cadavers
	2014, Conakry, Guinea [33]	Reproduction numbers, chains of transmission
	2014–15 Guinea [18] and Liberia [30,42–44]	Care in community, funerals and cremation. Also, assistance into taxi
	2015 Liberia [31]	Following sexual contact

Meta-analysis of clinical manifestations of Ebola by age category

To determine if an Ebola-ward clinician working on the fully functional ward prioritised data sharing outside the ward and employed a standardised prospective case reporting form for the Bundibugyo outbreak, filovirus ward clinicians typically apply their own judgement [19], [81], [82]. In this investigation, the Ebola symptoms were the ones that were most frequently seen. The analyses that follow (Tables 2, 3; Figures 2 and 3) provide more details on the FHF clinical signs and symptoms as well as the first known instance of a human disease brought on by this EBOV species that is allegedly unique. The most common clinical symptom in this study was filovirus infection, and filovirus ward doctors typically use their own judgement to determine whether. All participants in the study who disclosed contact did so either directly (11/14) or indirectly (3/14) by coming into contact with a potential infected body. During earlier filovirus epidemics, direct and funerary contacts were common ways for disease to spread [33], [49], [75]-[78]. However, of the participants in our study, 46% (12/26) claimed to have never met someone before. This might be the result of less in-depth patient interviews being done on the Ebola ward during busy times.

Because filovirus ward clinicians frequently utilise personal judgement when selecting whether an individual should proceed to a diagnostic test and hospitalisation or be released to the community [33], these described BEBOV clinical symptoms may aid future FHF clinical case detection efforts.

. For instance, this study sample only sometimes contained the suspected filovirus illness symptoms of fever and haemorrhage (3/26; 12%). Only three patients reported having a fever and bleeding before to admission, and only five hospitalised patients experienced one or more hemorrhagic symptoms. At the time of presentation to the Ebola unit, no one whose axillary temperature was taken had a fever. Severe headache, asthenia, and myalgia

are the three clinically prevalent symptoms that are most frequently reported in this study population. These symptoms are subjective and may also be indicators of endemic diseases like typhoid or shigellosis. As filovirus ward doctors regularly exercise their judgement in determining whether a Continuous thorough research of human FHF clinical symptoms in outbreak settings is recommended by experts to improve the precision of clinical detection]. Further gains in diagnostic accuracy beyond what is attainable with clinical and epidemiological data require both the ongoing and quick dispatch of field laboratories to filovirus outbreak scenarios and the eventual development of a bedside diagnostic. advancing to a diagnostic evaluation.

In this study, filovirus infection was the most frequently observed clinical symptom, and filovirus ward doctors typically make this decision on their own. The Bundibugyo outbreak in 2007–2008 had the lowest significant human EHF outbreak crude CFR to date. a quarter.

However, the CFR rises to 42 percent in hospitalised patients with laboratory confirmation, matching the figure discovered by MacNeil and colleagues for laboratory-confirmed acute-phase samples [69] and frequently seen in SEBOV outbreaks and sporadically seen in ZEBOV outbreaks. The low crude CFR may be inaccurate because it includes less serious cases that did not go to the hospital or because putative cases had false positives [8]. In this study, filovirus infection was the most frequently observed clinical symptom. Doctors on the filovirus ward frequently use their own discretion to decide whether to prescribe paracetamol for pain relief to 18 (95 percent of the 19 laboratory-confirmed patients) and cimetidine for dyspepsia to one patient (1 percent of the patients).. No additional drugs were given to treat the symptoms of Ebola. Seven patients (37%) received antibiotics for conceivable concurrent illnesses. 11 patients (58%) received antimalarials; 73 (%) of these patients passed away while receiving treatment, producing a marginally significant positive correlation between antimalarial administration and fatal outcome (OR 5.93, 95 percent CI: 0.93-50.5, Fisher's exact p-value = 0.05). Two of these individuals did, however, receive quinine, which suggests a more serious infection. The filovirus ward clinicians frequently make decisions ... Five patients were clinically observed during hospitalisation with

hemorrhagic symptoms, while three patients self-reported having them previous to admission. The sole survivor provided a self-report, and epistaxis was clinically noted (Table 2). One patient reported melaena of the two who self-reported haemorrhage and eventually died, whereas the other patient had haematemesis, epistaxis, and postpartum bleeding. Neither patient displayed any clinical haemorrhagic symptoms while undergoing treatment in the hospital.

Age, gender, place of residence, occupation, and Ebola ward were among the demographic factors. The four categories for possible EBOV infection contacts were none, indirect (through fomite), direct, and direct during burial practises [33]. For the symptoms, there were general and hemorrhagic categories. Supportive care included controlling dehydration, treating EHF symptoms, and administering antibiotics, antimalarials, and antibiotics. Ree patients admitted to having previously had hemorrhagic symptoms.

Meta-analysis of the incidence of laboratorytests

Symptom	Pooled Odds Ratio (95% CI)	P-Value	Prevalence in EVD patients (%)	Prevalence in non-EVD patients (%)	Number of studies (n = 8)	Tau-squared
Confusion	3.04 (2.18–4.23)	<0.001	22.6	7.7	5	0.04
Diarrhoea	2.99 (2.00–4.48)	<0.001	53.6	30.0	8	0.27
Conjunctivitis	2.90 (1.92–4.38)	<0.001	25.3	9.3	7	0.19
Fatigue	2.77 (1.59–4.81)	<0.001	59.6	36.9	8	0.51
Vomiting	2.69 (1.76–4.10)	<0.001	31.0	15.4	8	0.30
Anorexia	2.02 (0.78–5.28)	0.15	73.2	57.8	6	1.35
Fever	1.97 (1.10–3.52)	0.02	82.0	69.8	8	0.58
Dysphagia	1.95 (1.13–3.35)	0.02	20.8	12.8	7	0.37
Sore throat	1.88 (0.87–4.07)	0.11	22.1	10.8	5	0.53
Jaundice	1.86 (1.20–2.88)	0.005	51.8	39.8	5	0.09
Hiccups	1.82 (0.93–3.56)	0.08	17.9	16.3	7	0.61
Muscle Pain	1.65 (1.04–2.61)	0.03	21.4	18.1	8	0.36
Cough	1.63 (1.24–2.14)	<0.001	4.5	2.4	6	0.04
Bleeding	1.51 (0.86–2.67)	0.16	31.9	34.3	7	0.25
Chest pain	1.50 (0.88–2.54)	0.14	56.0	45.8	5	0.28
Abdominal Pain	1.47 (0.97–2.21)	0.07	51.1	43.3	8	0.28
Headache	1.34 (0.85–2.11)	0.21	24.7	17.2	8	0.36
Joint Pain	1.29 (0.85–1.97)	0.23	32.3	27.2	8	0.30
Shortness of Breath	1.02 (0.41–2.54)	0.97	49.5	55.7	7	1.18

https://doi.org/10.1371/journal.pntd.0008799.t003

VACCINES: -

Both humans and nonhuman primates (NHPs) are susceptible to the severe viral hemorrhagic fever (SVHF) caused by ebolaviruses, which has a case fatality rate of up to 90%. No specific drug or vaccination has been approved for use in humans as of yet. The best animal model for ebola hemorrhagic fever has been the nonhuman primate (NHP), and during the past 10 years, a number of vaccine candidates have been developed that are quite protective in NHPs.

This review examines the use of ebolavirus vaccines in various contexts, along with the requirements for each situation and a description of the existing ebolavirus vaccines. These vaccines contain recombinant adenoviruses, human parainfluenza viruses, vesicular stomatitis viruses (VSVs), and virus-like particles. Unexpectedly, one of these immunisation platforms has also shown post-exposure protection, which

Expert opinion;

The most crucial difficulty is getting these vaccine candidates into human trials and eventually onto the market. In particular for those who may already have compromised immune systems, it will be vital to identify the mechanisms and correlates of protection for these immunizations as well as to continue demonstrating their safety. However, there is currently enough evidence to suggest that an ebolavirus vaccination is feasible from a scientific standpoint.

A neglected viral disease known as Ebola virus disease is brought on by non-segmented negative-strand RNA viruses from the family Filoviridae (EVD). The most well-known member of the family, the Ebola virus (EBOV), a member of the Zaire ebolavirus species, is responsible for the largest reported EVD outbreaks, including the West African epidemic and the present outbreak in the Democratic Republic of the Congo. EBOV is the focus of current EVD vaccination strategies, and numerous phase 1-4 human studies have just been finished. Some of the most cutting-edge platforms include the vesicular stomatitis virus (VSV-EBOV), various human (Ad5 and Ad26) and chimpanzee (ChAd3) adenoviruses,

modified vaccinia ankara (MVA), and DNA-based vaccines given as a prime-only, homologous, or combination vaccine.

Highlights from the article;

Since 1976, a number of outbreaks of the Ebola virus disease have been brought on by the Zaire ebolavirus species of the family Filoviridae, also known as the Ebola virus (EBOV). (EVD).

Modern filovirus immunisation strategies focus on EBOV and have numerous phase 1-4 human trials using the prime-only and prime-boost approaches.

The most innovative vaccination approaches use DNA platforms, modified vaccinia ankara (MVA), human (Ad5, Ad26), chimpanzee (ChAd3), and vesicular stomatitis virus (VSV), which can be used singly or in combination.

After being tested on humans, the aforementioned vaccination methods showed an overall good safety record. Human experiments have shown that the aforementioned vaccine approaches are immunogenic, albeit the correlates and mechanisms of immunity are yet unknown.

China, Russia, and Europe have so far granted licences for EBOV vaccine products.

Declaration of interest:-

H. Feldman alleges ownership of intellectual property with regard to the filovirus vaccine based on the vesicular stomatitis virus. Except as stated, the author has no further connections to, financial interests in, or disagreements with any organisation or institution about the information or subject matter addressed in the text.

Information about Peer Reviews.

The reviewers of this manuscript should not declare any affiliations, financial or otherwise, that are pertinent.

Disclaimer: -

The author's opinions may not correctly reflect the official position of the Infectious Interest Statement or the National Institute of Allergology in this study's theories, conclusions, or recommendations.

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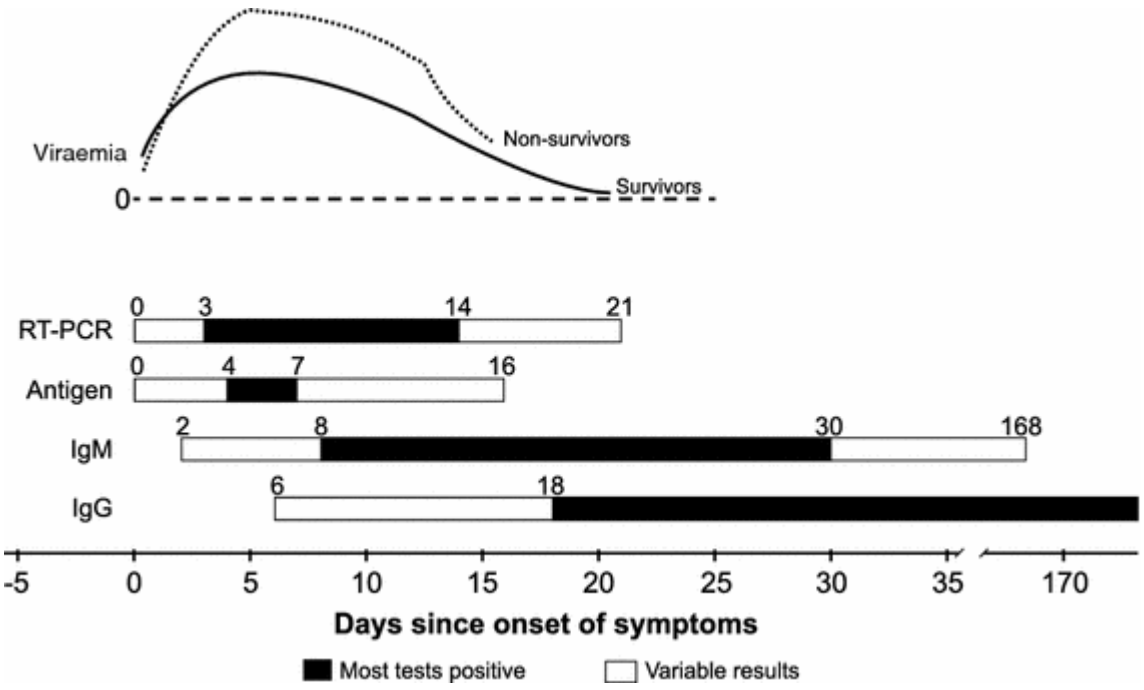
Desired characteristics of an ebolavirus vaccine for different vaccination scenarios

Characteristic	**outbreak response vaccination**	**preventative vaccination of risk groups**	**wild-life vaccination**
rapid protection	essential	not essential	not essential
long-lasting immunity	desirable, but not essential	essential	Essential
cross-protection against multiple species	desirable, but not essential, since species causing outbreak can be rapidly determined	essential	Essential
number of vaccinations	single vaccination essential	multiple vaccination tolerable	single vaccination essential

DIAGNOSIS



Average viraemia among Ebola disease survivors and non-survivors, as well as anticipated outcomes of diagnostic laboratory tests in terms of the time period after the onset of symptoms. Most people who have fatal inflammation don't react with IgG antibodies.

Culture

The requirement for a tissue culture facility with Biosafety Level 4 containment limits virus culture. Since viral development is sluggish, direct patient treatment is not a good use for it.

Polymerase chain reaction (PCR)

RT-PCR, which concentrates on viral nucleic acids, is a quick and accurate method for identifying the Ebola virus. For the purpose of detecting the Ebolavirus, various commercial and internal PCR tests are available [8].

WHO advises referring tests conducted outside the reference laboratory to WHO cooperation facilities for secondary confirmation, such as the Pasteur Delyon Institute (France) and the Bernhard Nocht Tropical Medicine Institute (Germany). doing.

An emergency system to assess in vitro diagnostics has been established by WHO. Only one RealStar Filovirus Screen RT-PCR Kit 1.0 product—made by Altona Diagnostics GmbH in Hamburg, Germany—remains approved as of December 11, 2014 [9].

As part of this, the US Food and Drug Administration (FDA) recently granted an emergency use authorization for the Ebola virus nucleoprotein (NP) real-time RT-PCR assay (http://www.fda.gov/downloads/MedicalDevices/). Safety / Emergency / UCM418810.pdf). It has been reported that the sensitivity in the acute phase is excellent (about 100%), but false negative results (specificity is about 97%) [10] are possible, and there are multiple possible causes.

C. Premature or improper sample collection, improper shipping or storage, or improper PCR technology. Experience has shown that no virus is detected during the incubation period and PCR can be negative up to 72 hours after the onset of symptoms [11, 12].

D. False positive results can also occur, primarily due to mutual contamination during PCR techniques.

E. Rapid testing of many samples in endemic regions has not yet been approved, however a single sample can be examined within 6 hours using either the Altona PCR kit or the FDA-approved kit.

F. You need an antigen detection cassette. The development of quantitative RT-PCR may be utilised to forecast outcomes. According to some evidence, extremely high viral loads may be linked to severe outcomes, like mortality [13, 14].

G. Viremia often goes down in survivors by the end of the second week of sickness [4, 15]. (Figure 1).

H. The virus can also be found in bodily fluids like perspiration, semen, and saliva. According to WHO, cotton swabs can be collected in deceased patients or in situations where blood cannot

Antigen recognition

Antigen detection ELISA was the standard method for detecting EVD prior to the year 2000 [16], but it has now been completely supplanted by RT-PCR, which is a little more sensitive and is also more easily implemented in epidemic situations [15].

In the early phase [10], antigen detection is similarly quite sensitive (93 percent), but as the infection progresses, it becomes less sensitive (antigen disappears after 7–16 days [17], a few days before PCR turns negative [15]).

In one study from the 2004 Uganda EVD outbreak with the Sudan strain, it was shown that PCR will discover cases more quickly than antigen capture.

Several quick antigen detection methods are now being evaluated, and RT-PCR may benefit from their sensitivity and usability in upcoming epidemics.

Serology

In the first week after the onset of symptoms, the specific IgM antibody is found by capture ELISA, peaking in the second week of illness [4, 16, 17].

It gradually vanishes between 30 and 168 days after it starts. IgG antibody emerges shortly after IgM antibody and continues for many years, six to 18 days after the onset of symptoms [17]. For IgG diagnosis, pairs of serum samples are required. IgG

antibody responses are typically absent in patients with fatal illnesses [4]. Therefore, having an antibody may be associated with a better outcome.

Therefore, having an antibody may be associated with a better outcome.This implies that serology may be less sensitive in the ICU.

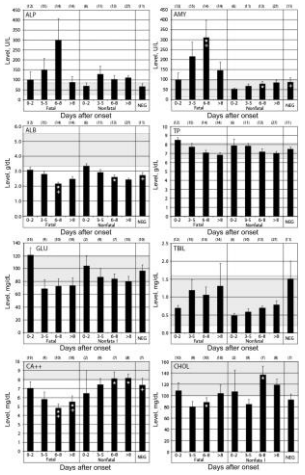
DISCUSSION

It was observed that 87.8% (N = 209) of the total number of visualizations of Ebola-related information registered during the study period corresponded to those containing technical biomedical content. (Basically epidemiological data, viral life cycle, adverse effects of infection or control Measures to treat patients to minimize the risk of infection). Other 12.2% (not included) In this study) it is about non-medical information about Spanish patients (especially Miguel) Pajares and Teresa Romero) and epidemic side effects (eg pure locator map) Illustrative characters, graphics, show the various social parameters of the affected African countries.

Comparison with the same parameters in Spain or a graph that parallelizes EVD and camber About the stock exchanges of several companies in the aviation industry). Other studies have reached similar conclusions. In the analysis of infographics about epidemics Risks Shin (2016) compared the main sources of their occurrence with their communication goals. She found that in media infographics, almost 85% of messages were informative. Nature, that is, they showed technical biomedical information about the disease. In contrast, informative messages from healthcare infographics accounted for only 46%. total. Most of the content was published in August and October 2014 (34.7% and 35.8%, Each) coincides with the return of Spanish missionary Miguel Pahares Infection of assistant nurse Teresa Romero in Liberia (August 6) and Madrid (October 6) (cf)Figure 1). Media coverage of this topic identified eight technical and biomedical aspects: "epidemiological data" (56%), "preventive and control measures" (16.3%), and "harmful effects" (12.4%). rice field.

Figure 1. Frequency distribution of articles by visualization of trendy information. The only article published in 2016 (January) is not displayed. 372 General understanding of science 27 (3) "Treatment and treatment" (6.7%), "Cause of infection" (3.8%), "Viral life cycle" (3.3%), "Viral load".

Figure 3 Levels of various blood analytes. Graphs show the mean levels of alkaline phosphatase (ALP), amylase (AMY), ...



J Infect Dis, Volume 196, Issue Supplement_2, November 2007, Pages S364–S371, https://doi.org/10.1086/520613

"In body fluid" (1%) and "Molecular structure of virus" (0.5%). The first ("epidemiological data") is basically, West Africa affected by the disease. Changes in the number of infected and dead people over time Or healed; and mortality. Epidemiological information coverage during the public health crisis How it is produced is a priority for the mass media and is therefore frequent here. This epidemiological information was published in all months before and after the peak.

August and October 2014 (69% of information visualization) suggest a recurring and recurring phenomenon throughout the media coverage of this topic. Some in April 2014. A few days after the epidemic outbreak was officially announced, the media began publishing epidemiological data in qualitative map format (reliable numerical data were not yet available).

It was not until June that quantitative data of epidemiological properties were first published. Table 1 shows three scenarios created by the press to contextualize epidemiological information. Scenario 1 was the most common (77.8%), with an impact of only The first (“epidemiological data”) is essentially related to the distribution of geographical areas.

West Africa affected by the disease. Changes in the number of infected and dead people over time Or healed; and mortality. Epidemiological information coverage during the

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It was not until June that quantitative data of epidemiological properties were first published. Table 1 shows the three scenarios that the written press created to contextualise the epidemiological information. Scenario 1 was the most frequent (77.8%) and pertained exclusively to information on the ongoing Ebola epidemic, Scenario 2 compared data on the current epidemic with those of other previous Ebola outbreaks (18.8%) and Scenario 3 compared data on the ongoing Ebola epidemic with those pertaining to different viral epidemics occurring beforehand (e.g. SARS, bird flu, Middle East Respiratory Syndrome [MERS]) (3.4%). From the data shown in Figure 2, several interesting conclusions can be drawn about the distribution of technical-biomedical content by newspaper. ABC (a conservative, monarchical and Catholic daily) and El Periódico (a progressive Catalan newspaper) were those that gave most coverage to this kind of content (25.4% and 24.9%, respectively); the newspaper that paid the least attention to technical-biomedical content was La Vanguardia, a centre-right Catalan daily with a national circulation (13.9%), followed by the liberal newspaper El Mundo (16.7%).

However, El País (19.1%), a progressive daily with the largest circulation in Spain, was the newspaper that offered a greater diversity of technical-biomedical content; in effect, it was the daily that provided information on the molecular structure of the virus and the target cells that it infects (endothelial cells and hepatocytes, among others) (El País, 7 October 2014) and a unique diagram of the process which showed the windows of time during which the viral load (quantity of the virus) is positive in different corporal fluids (e.g. blood, faeces, saliva, semen) (El País, 12 October 2014, reused in another article published on 7 November 2014).

1. Likewise, it is noteworthy that the two Catalan newspapers (La Vanguardia and El Periódico) paid less attention to information on control and prevention measures (23.5%)

than the dailies published in Madrid, namely, ABC, El País and El Mundo (76.5%) Nevertheless, the impact is linked to the rules of spatial proximity journalism.

The importance of popular culture in reporting should not be overlooked, as both safety measures and protective equipment are easily associated with scientific stereotypes. A topic that is fascinating to fiction and therefore the media.

2. Possible associations between "visual" nominal variables to answer 3. "Expression" (qualitative, quantitative, mixed and hybrid) and "technical-biomedical content".

Tested using the chi-square test. An alternative hypothesis (existence of association) was confirmed, $\chi 2$ (21, N = 209) = 121.88, p & lt; 0.001. The close relationship between content and its form of expression is described below. All quantitative graphs and maps (n = 66) are for presentation purposes only. Epidemiological data (see Table 2). This result is consistent with the fact that people tend to deploy I'm more confident in the numerical information on health and risk topics than in other formats, It is usually difficult to understand (Bell et al., 2006). Visual aid is better A simpler interpretation of quantitative information (see, eg, Stone et al., 2015; Tufte, 1983). The results here are consistent with those of other authors (DiFrancesco and Young, 2010; Rebich-Hespanha et al. , 2015; Smith and Joffe, 2009). For example, to display statistical data Climate change (eg national or temporary greenhouse gas emissions) Changes in atmospheric CO2 levels), the British press relied on numerous bar graphs and lines. Chart (Smith and Joffe, 2009). In the case of Welhausen (2015), by using maps and line graphs, The last EVD epidemic: the former crossed national borders, and The latter is due to the continuous increase in the number of infected people. virus and increased deaths in West Africa. In Spain, this feeling was even greater.

The first case of infection in Europe has been significant since it occurred in Madrid on October 6, 2014. Similarly, qualitative maps (colorful, n = 21, descriptive, n = 1), flowcharts.

(Qualitative, n = 3), localization map (qualitative, n = 5 and quantitative, n = 9), and hybrid map.

CONCLUSION

The ability to improve access to monitoring data for guidance on response strategy has been demonstrated through the adoption of mobile health applications on cellphones to aid with Ebola contact tracing activities. It is also conceivable to apply this kind of methodology to other Ebola response pillars in order to improve quick access to data and include crucial indicators into the response chain. Although implementing technology in challenging circumstances is not without its challenges, innovation's capacity to challenge the status quo can be a key factor in keeping persistent diseases under control. In the event of a continuous outbreak, it is crucial to carefully consider whether and how to deploy new technology. When it is chosen to introduce a technology, it must be done so with careful administrative control. Mobile contact tracking solutions cannot be directly adopted by another system since Guinea currently lacks a formal government digital health information system that permits quick collecting and analysis of health data. Governments and UN organisations in Guinea are, however, interested in employing digital technology for ongoing surveillance, particularly when integrated with effective primary healthcare systems. The operational expenses necessary to establish a mobile health programme at the national level are unquestionably significant and must be legally justified. Partner organisations donated a large portion of the materials and labour required to build up this system for the purpose of fighting the Ebola virus. This initial investment in human resources, domestic technical know-how, and hardware for the program can be reliably leveraged and expanded to enhance the healthcare system.

With the right technical capabilities and monitoring, mobile technology has the potential to increase access to critical data from remote communities needed to control outbreaks. As we learned from this Ebola epidemic, it is important to recognize and plan for more powerful information systems that can identify and report health trends and abnormalities. Accurate and easily accessible data helps health observers quickly identify and contain outbreaks. In addition, powerful information systems can be used not only to prevent new epidemics, but also to adapt to activities such as contact tracing in the event of a disease. Therefore, investing in a strong community-based information system is essential to strengthening the medical system and preparing for emergencies to prevent future

epidemics as tragic as the 2014-2015 Ebola hemorrhagic fever outbreak in West Africa. Should be considered as a part.

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