

Chapter 1

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ABSTRACT

Yuri EVD is a disease of humans and other non-human primates caused by *Ebola viruses*, which was first discovered in 1976. Between 1976 and 2013 there had been 24 outbreaks of the disease. The recent outbreak is the 26th and has seen more deaths than all other outbreaks from the disease combined. This outbreak in West Africa occurred in five countries: Guinea, Liberia, Nigeria, Senegal, and Sierra Leone.

Zhi wei In the present research article, the authors reviewed various studies and current research on EVD. EVD was initially restricted to West Africa when the outbreak was first identified but later was reported in several countries around the world, including the USA. Researchers have begun to use mathematical analysis from previous outbreaks to construct the Atangana's Beta Ebola System of Equations (ABESE), which is being used to predict the spread of future outbreaks. The pathophysiology and transmission factors, including the basic and effective reproduction numbers, R_0 and R_e are discussed in detail. Prevention and control measures, such as proper hygiene techniques (both preventative and post-exposure), education (including educating communities on proper burial techniques), reduction in the consumption and exposure to bush meat, and controlled prevention of the spread of the disease (proper personal protective equipment and protocol upon exposure or in high-risk environments), are outlined. The history and current outbreak are reviewed in detail, which compares the differences in previous outbreaks compared to the current.

Asma Earlier (and less deadly) outbreaks have also been traced to the ZEBOV strain, and researchers suggest that the evolutionary rate of gene mutations was accelerated in this current outbreak. Death occurs in approximately 40% of affected individuals within 7-12 days after the onset of initial symptoms and is most often associated with multi-organ failure. Researchers outline the WHO's criteria for screening and diagnosis, including primary, secondary and entry screening. There is currently no approved cure for EDV, only supportive and experimental treatment and a currently FDA approved vaccine from Merck & Co's. There are ongoing trials on the following vaccinations: ZMapp, TKM-Ebola, Favipiravir, cAd3, rVSV.LG-ZEBOVGP12, REGN-EB3 and mAb-114. This review article will attempt to summarize the current state of understanding on EVD and explore the most recent and accepted information including the epidemiology of the disease, etiology and pathophysiology, transmission, prevention and control, history, recent outbreaks in West Africa, clinical manifestations, screening and diagnosis, and treatment and clinical trials.

Keywords: *Ebola virus disease; outbreak; surveillance; RNA virus.*

1. INTRODUCTION

Ebola virus disease (EVD), also known as Ebola hemorrhagic fever (EHF), is a disease of humans and other primates caused by *Ebola viruses*. The disease was first identified in 1976 during two

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