Paving the way for an Ebola-free West Africa

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Credit: AI-generated image (disclaimer)

The 2014–2016 Ebola virus epidemic in West Africa was the worst outbreak of the disease since its discovery in the 1970s. Centered in Guinea, Liberia and Sierra Leone, the epidemic claimed over 11 300 lives—more than all the previous Ebola outbreaks combined. Subsequent outbreaks as recently as 2021 highlight the fact that the threat is far from over, and that safe and effective vaccines are needed just as urgently as ever.

To help fight the disease, scientists supported by the EU-funded EBOVAC1, EBOMAN and EBODAC projects assessed the safety and effectiveness of a two-dose Ebola vaccine regimen developed by Johnson & Johnson. Their research showed that the regimen is safe and well tolerated, and it produces a strong immune response in both children and adults. The respective papers have been published in the journal *The Lancet Infectious Diseases*.

The study was conducted in Sierra Leone and consisted of two stages. In the first stage, 43 adults aged 18 years or older received their first dose of the vaccine (Ad26.ZEBOV) on the first day and an MVA-BN-Filo booster shot on day 57. The second stage studied vaccination results in 400 adults and 576 children aged one to 17, who were either vaccinated as above or had received a single dose of the meningococcal quadrivalent conjugate vaccine followed by a placebo on day 57. An Ad26.ZEBOV booster shot offered to stage 1 participants two years after the first dose induced a strong immune response within seven days. The study is reportedly the first to investigate the safety and immune response of this two-dose vaccine regimen in a region affected by the 2014-2016 outbreak. It is also the first to assess its effect on children.

Life-saving results

"This study represents important progress in the development of an Ebola virus disease vaccine regimen for children, and contributes to the public health preparedness and response for Ebola outbreaks," reports first author Dr. Muhammed Afolabi of the London School of Hygiene & Tropical Medicine (LSHTM) in a news item posted on ScienceBlog. "The results show that this vaccine regimen has the potential to save many young lives."

The Ebola virus is first transmitted to humans through direct contact with the blood, body fluids and tissues of infected animals, most likely

bats or primates. It then spreads to other people when they come into direct contact with the body fluids of someone who is ill with or has died from the disease. With an average fatality rate of 50 %, this frequently fatal disease even reached a staggering 90 % fatality in the Republic of the Congo during the 2003 outbreak.

"Despite the additional global challenges around COVID-19, we must not slow down efforts to find effective ways of preventing Ebola virus epidemics and, should outbreaks occur, of containing them rapidly. Vaccines have a key role in meeting both of these objectives," observes senior author Prof. Deborah Watson-Jones of the LSHTM. The studies supported by EBOVAC1 (Development of a Prophylactic Ebola Vaccine Using an Heterologous Prime-Boost Regimen—Sofia ref.: 115854), EBOMAN (Manufacturing and Development for Rapid Access Ebola Vaccine (EBOMAN) – Sofia ref.: 115850), and EBODAC (Communication strategy and tools for optimizing the impact of Ebola vaccination deployment—Sofia ref.: 115847) is a prime example of such efforts.

More information: David Ishola et al, Safety and long-term immunogenicity of the two-dose heterologous Ad26.ZEBOV and MVA-BN-Filo Ebola vaccine regimen in adults in Sierra Leone: a combined open-label, non-randomised stage 1, and a randomised, double-blind, controlled stage 2 trial, *The Lancet Infectious Diseases* (2021). DOI: 10.1016/S1473-3099(21)00125-0

Muhammed O Afolabi et al, Safety and immunogenicity of the two-dose heterologous Ad26.ZEBOV and MVA-BN-Filo Ebola vaccine regimen in children in Sierra Leone: a randomised, double-blind, controlled trial, *The Lancet Infectious Diseases* (2021). DOI: 10.1016/S1473-3099(21)00128-6

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