



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Sudan Ebola outbreak of known strain

Between May 15 and 31, health authorities of Yambio County reported a total of 25 cases, including six deaths, of Ebola haemorrhagic fever in Yambio, in the western equatorial region of Sudan.

The WHO South Sudan Early Warning and Response Network, along with a team from WHO headquarters in Geneva, have been working closely with health authorities and partners in Yambio County to help create a crisis committee to control the outbreak. The committee includes UNICEF, Médecins sans Frontières, and other non-governmental organisations and churches working in public health. The committee has been working actively on social mobilisation, supporting case management in Yambio hospital and organising the follow-up of contacts of people who have been ill with the disease.

Initial tests of blood samples taken by the US Centers for Disease Control and Prevention (CDC; Atlanta, GA, USA) indicated that the outbreak was not linked to the known strains of Ebola viruses. Moreover, scientists at the WHO southern Sudan office initially launched a theory that the outbreak in Yambio was of an unknown Ebola strain, which they suspected was milder than other discovered strains. The main reason for this belief was that the death rate seemed to be lower than in Ebola outbreaks previously registered. Past major outbreaks of Ebola haemorrhagic fever occurred in 1976 (southern Sudan, 117 deaths of 284 people infected), 1995 (Congo, 280 deaths of 318 people infected), 2000 (northern Uganda, 173 deaths) and 2002 (Congo, 100 deaths).

Four strains of Ebola have been discovered so far. Ebola-Zaire, the first-discovered Ebola virus, is the most deadly. At its worst, it has a 90% fatality rate. There have been more outbreaks of Ebola-Zaire than any other type of Ebola virus. The first outbreak was in 1976 in Yambuku, Zaire. In 1989, crab-eating macaques from the Philippines brought another strain, Ebola-Reston, into quarantine



Ebola virus

in Virginia, Texas, and Pennsylvania. Although four people developed antibodies from exposure to the virus, none became ill. The Ebola-Reston strain has re-emerged in monkeys several times since but no human beings have contracted it. Another

strain, Ebola-Ivory Coast, infected a scientist in 1994 after he did an autopsy on a wild chimpanzee: it is the only reported case. Finally, Ebola-Sudan strain is also known to cause outbreaks among people. It usually strikes in east Africa and has a mortality rate of around 50% but is more contagious than Ebola-Zaire.

On June 4, Abdullahi Ahmed, head of the WHO Office for Southern Sudan, told *TLID* that both the Kenya Medical Research Institute and CDC confirmed the virus responsible for the Yambio outbreak was the known Ebola-Sudan maleo strain.

Xavier Bosch

Phase I SARS vaccine trial in China

The world's first phase I clinical trial of a vaccine against severe acute respiratory syndrome (SARS) has started in China. The inactivated-virus vaccine was developed by the company Sinovac and researchers from the Chinese Academy of Medical Sciences, both in Beijing. On May 22, four volunteers were injected with vaccine or placebo at the China-Japan Friendship Hospital, Beijing. A second shot will be given 28 days after the first and all volunteers will be followed-up for 210 days. Altogether 32 volunteers from Beijing provinces will participate in the trial.

As *TLID* went to press no adverse reaction had been registered. "The fact that the Chinese are moving forward with trials . . . is unprecedented in terms of the speed with which we've gone from identifying a new infectious agent to a prototype vaccine", comments Gary Nabel (Vaccine Research Centre, NIH, Bethesda, MD, USA), whose team hopes to start their own phase I trials on a DNA vaccine later this year.

"The reason to enter a clinical trial is because we have done a lot of tests on different animals, such as mice, guinea pigs, rats, rabbits, and Rhesus monkeys which have shown

positive results with no immune enhancement occurring", says Helen Yang, Sinovac spokesperson. Nabel cautions that should SARS be contained as successfully as last year, it may not be possible to do a human vaccine study capable of showing efficacy. "If that's the case, then before moving to much larger numbers of people, we definitely need better animal models. I don't think that any of the models that have been tested to date really give a very faithful model of the human disease."

The Chinese State Food and Drug Administration is fast-tracking the drug approval process for the Sinovac vaccine. "Based on the regular drug approval process in China, it would take between 3 and 5 years for a SARS vaccine to receive final commercial approval. With fast-tracking, it could take as little as 1 to 2 years". Whether or not such a compressed timetable proves feasible, phase I trials will yield an initial assessment of immunogenicity and safety in human beings. "While these new vaccines are being generated, they do provide some tools to work with if there should be an outbreak", Nabel concludes.

Claudia Orellana