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.

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With almost yearly Ebola virus outbreaks occurring in central Africa, the need for protective immunisation is more evident than ever. Large-scale vaccination of at-risk populations in countries where the virus is endemic has been considered to reduce the impact of outbreaks and restrict propagation from the first or first few individuals who contract the disease. In time, vaccination of entire populations in endemic countries could be considered, and could even prevent zoonotic transmission of the Ebola virus to humans. As such, licensed vaccines would reduce the immediate and long-term fatality associated with the Ebola virus infection,\(^5\) the suffering of Ebola virus disease survivors plagued by long-term medical complications,\(^6\) as well as the economic burden associated with Ebola virus outbreaks.

The current COVID-19 pandemic has highlighted the ability of emerging pathogens to disrupt existing supply chains, global public health, and economies. Having multiple licensed vaccines, produced by several manufacturers in distinct locations is important to prevent vaccine shortage. In line with this rationale, developing more licensed vaccine regimens for each target pathogen of importance is of high value to prevent societal disruption from infectious disease outbreaks and save lives.

We declare no competing interests.

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Immunity to Ebola virus: the full picture is being revealed

In The Lancet Infectious Diseases, Ruth Thom and colleagues\(^1\) report substantial information concerning naturally acquired immunity following an infection with Zaire ebolavirus.\(^1\)

Their report shows strong and stable humoral and cellular responses among the majority of 117 Ebola survivors enrolled in Guinea. Between 3 and 14 months after infection, 113 (96%) of the 117 survivors had detectable titres of neutralising IgG antibodies to Ebola virus Mayinga and 101 (87%) of 116 produced interferon \(\gamma\) after re-stimulation of peripheral blood mononuclear cells with glycoprotein. In a longitudinal analysis done on a subgroup of 96 (82%) of the survivors, these responses were stable for up to 3 years after discharge from the Ebola treatment centre. These results are consistent with the immune profile of a subgroup of 35 individuals from the Postebogui Guinean survivors cohort, in which all participants had Ebola virus-specific IgG antibodies and showed robust specific T-cell memory responses up to 25 months after discharge from an Ebola treatment centre.\(^1\) In these studies, none of the unexposed people or healthy donors tested positive for Ebola virus-specific antibodies. Thom and colleagues did not test the hypothesis that long-term persistence of the immune responses in survivors could be due to re-exposure from immune privileged sites; however, the presence of Ebola virus RNA in semen long after discharge from Ebola treatment centre is now well documented.\(^3\,4\)

The authors argue that the mean neutralising titre assessed in survivors is much higher than the immune response observed 1 month after one dose of the recombinant vesicular stomatitis virus-Zaire Ebola virus envelope glycoprotein vaccine (rVSVΔG-ZEBOV-GP) in a phase 1 trial. This comparison is challenged by a vaccine study in Guinea where 83% of 1053 frontline workers express a seroresponse 1 month after vaccination, with...
a nine-fold increase in neutralising antibody titres from baseline. In the same study, seroresponse persisted 180 days after vaccination in 84.2% (95% CI 74.4–90.7) of individuals who seroresponded after 28 days. By contrast, the cellular response after a natural infection appears much higher than after vaccination. Another study in Guinea, which compared immune responses between ten rVSV-ZEBOV vaccinees and 25 survivors, found high and equivalent antibody titres 6 months after vaccination or natural infection. Overall, these studies of vaccine immunogenicity implemented in operational conditions are consistent with the results generated by early vaccine trials done in healthy adults in the USA, Canada, and Spain.

The report by Thom and colleagues also provides useful information regarding the immune responses in contacts of Ebola virus disease cases. Although no distinction between asymptomatic and paucisymptomatic presentations of the infection can be made, both neutralising antibodies and cellular responses were identified in six (9%) of the 66 contacts. This figure compares well with the seropositivity observed in asymptomatic and paucisymptomatic contacts in Guinea (3.3% vs 8.3%) and Sierra Leone (2.6% vs 12.0%).

In summary, on the one hand, we have accumulated sufficient clinical and immunological data from survivors of the 2013–2016 West African Ebola epidemic in favour of acquired immunity to Ebola virus lasting at least a few years after a natural infection. On the other hand, studies of correlates of protection for Ebola vaccines that support an induced immunity have, so far, only followed patients for up to 6 months. Natural acquired immunity could provide protection to people who have been exposed to and infected with Ebola virus for at least a few years, even if antibody concentrations decrease with time, owing to backup memory B cells and cellular immunity.

I declare no competing interests.

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**Optimising dengue pre-vaccination screening**

As the world is grappling with the global COVID-19 pandemic, dengue epidemics continue to rage relentlessly in the tropics and subtropics. About 100 million dengue cases are reported every year, often overwhelming already fragile health-care systems, with the highest burden in southeast Asia followed by Latin America. Dengue and COVID-19 have in common that epidemic transmission is driven by population densities, and both are rapidly spread via travellers. The difference between the two diseases is the mode of transmission. The four dengue virus serotypes are transmitted by *Aedes* spp mosquitoes, which mainly proliferate in the climatic conditions of the tropics and subtropics, whereas severe acute respiratory syndrome coronavirus 2 is transmitted via respiratory droplets ubiquitously.

While the scientific community is racing towards developing a vaccine against COVID-19, we already have a vaccine at hand against dengue. First licensed in 2015, the tetravalent live attenuated dengue vaccine developed by Sanofi Pasteur (CYD-TDV, with the trade name of Dengvaxia) was evaluated in more than 30,000 children in ten countries in Asia and Latin