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South African scientists launch trial to test whether MMR vaccine protects front-line health-care workers against COVID-19

Vaccine may strengthen immune response to viral infections, including SARS CoV2

South African scientists from the Universities of the Cape Town (UCT) and Witwatersrand are launching a clinical trial to test whether the childhood vaccine for measles, mumps and rubella (MMR) can protect front-line health-care workers from COVID-19, or reduce the severity of illness for those who do become infected.

The MMR vaccine has been given safely to hundreds of millions of people around the world since it was approved nearly 50 years ago and successfully reduced the incidence of measles, mumps and rubella worldwide. Typically, the vaccine is given to children, with most getting two doses before age six.

The research team leading the trial points to growing evidence that suggests the MMR vaccine may have benefits beyond protecting against measles, mumps and rubella. It could broadly boost an individual's immunity and may prevent infection from SARS-CoV-2 for a limited period.

The first reason the MMR vaccine may be effective is that there are similarities between the weakened viruses in the vaccine and the SARS-CoV-2 virus that causes COVID-19. All of these viruses have similar proteins on their surfaces that are involved in infecting cells in the body, so the researchers think that antibodies made in response to the MMR vaccine also may recognise and fight the SARS-CoV-2 virus.

Unlike the drugs remdesivir and dexamethasone, the only medications so far identified as being helpful in treating COVID-19, the MMR vaccine would not be used to aid recovery from illness. Instead, the researchers want to learn whether the vaccine can elicit an immune response that slows the spread of the virus and protects front-line health-care workers who work in high-risk settings from developing COVID-19.

Professor Bruce Biccand, national co-principal investigator and second chair in the Department of Anaesthetics at UCT, believes that this approach is complementary to the search for specific SARS CoV2 vaccines. "If we discover that the MMR vaccine can help train the body's immune response to SARS-CoV-2 infection, then we will have something to administer very quickly,

while waiting for more specific vaccines and preventive therapies to be developed,” Biccard argues. “If the trial shows that the MMR vaccine can boost the body’s immune response, we believe it also may enhance the effectiveness of vaccines currently in development to prevent SARS-CoV-2 infection.”

The vaccine also carries small amounts of live, weakened viruses that could train the body’s immune system to fight multiple pathogens.

“We know that the MMR vaccine is safe, and we think there are two main reasons that it could prevent COVID-19,” said one of the trial’s national principal investigators, Sinead Delany-Moretlwe from the Wits Reproductive Health and HIV Institute (Wits RHI). “This type of vaccine which contains small amounts of very weakened measles, mumps and rubella viruses appears to strengthen the body’s immune response to infections in general, not just to the viruses in that particular vaccine.”

The study will recruit front-line health-care workers from low-and-middle income countries like South Africa, Zambia, Zimbabwe, Ghana, Uganda as well as high-income countries like the United States of America, United Kingdom, and Ireland. Protecting the health-care work force is critical in many of these countries where the health system is already constrained and could provide a substantial public health benefit both in sustaining the COVID-19 pandemic response, as well as preserving other important health care programmes.

Professor Linda-Gail Becker, a professor of infectious diseases at UCT and an investigator on the trial believes that focusing on health-care workers is essential: “We need to focus on frontline health-care workers and their safety as the cornerstone to an effective pandemic response. South Africa also provides an opportunity for us to show whether this vaccine can protect health care workers living with HIV against COVID-19”.

Health-care workers in the trial will be divided randomly into two groups. One will receive the MMR vaccine, while the other group will receive an inactive placebo. Health-care workers can join the trial even if they received the vaccine as children. Each participant will be followed for five months, and the entire trial is expected to last about a year. Those previously sick with COVID-19, those who are pregnant and those who are taking drugs that suppress their immune systems or are seriously ill will not be eligible to participate. The South African team hope to enrol up to 5000 health-care workers in several sites in Gauteng, the Western Cape, Free State and KwaZulu-Natal.

Professor Helen Rees, executive director of the RHI, responsible for international governance and coordination on the trial believes that this trial will have important results for the region. “Many millions of people in the world received the MMR vaccine during childhood, and it is known to be extremely safe,” Rees said. “If this widely available vaccine turns out to be helpful, it could be a very important tool for protecting health-care workers, and we need additional tools beyond personal protective equipment and good hand hygiene, which remain vital in fighting the pandemic.”

[The CROWN Coronavirus Prevention \(CORONATION\)](#) adaptive trial platform launched as the global pandemic was beginning, and is co-led by Washington University, USA; University College London, UK and the University of the Witwatersrand in Johannesburg via the CROWN (COVID-19 Research Outcomes Worldwide Network) Collaborative, an international research network of physicians and scientists from institutions in Africa, Europe and North America. The trial itself is funded by a \$9 million grant from the COVID-19 Therapeutics Accelerator — an initiative launched by the Bill & Melinda Gates Foundation, Wellcome, and

Mastercard with support from an array of public and philanthropic donors, including the South African Medical Research Council. The Therapeutics Accelerator works to speed up the response to the COVID-19 pandemic by identifying, assessing, developing and scaling up treatments.

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