

# Chronic parasitic infections can affect vaccine efficacy: Lessons for COVID-19

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Over a year since the first case of the SARS-CoV-2 pandemic, fast advances in vaccine development have given the world a fighting chance against the coronavirus. [SARS-CoV-2](#) vaccines have become leading instruments against severe health effects associated with COVID-19 disease.

SARS-CoV-2 vaccines reduce severe disease and improve survival of infected patients. Their impact has been seen in [developed countries](#) where mass vaccination has been most efficient. In developing regions, such as many African countries, SARS-CoV-2 vaccination campaigns have been relatively slow.

The impact of COVID-19 has differed among [developing African countries](#). In some, SARS-CoV-2 infections have been relatively low. Others have reported high numbers. Vaccine coverage of the continent is still [low](#) as countries await adequate supplies.

But there is an added worry: the effectiveness of vaccines in developing countries, particularly those with very high levels of [chronic parasitic infections](#). These are a major cause of morbidity and mortality and are prominent among the so-called [neglected tropical diseases](#).

One of these is schistosomiasis, also known as bilharzia. Symptoms of it present as a sudden onset of fever, dry cough, diarrhea and abdominal pain. About [90%](#) of the people requiring treatment for this debilitating parasite are sub-Saharan Africans.

[Research](#)—on both animal models and [human studies](#)—suggests that chronic schistosomiasis infection can result in decreased [vaccine](#) efficacy.

In a recent paper, we [reviewed](#) evidence on the influence of infection with the [parasitic worms](#) causing schistosomiasis on host immune responses to vaccines. The vaccines we focused on were to prevent measles, hepatitis B, tetanus and tuberculosis.

We found that measles and hepatitis B vaccines were less effective in people who have schistosomiasis.

We also evaluated the potential of using medication designed to treat parasitic worm infections in restoring vaccine responses affected by schistosomiasis. We found that it can improve vaccination effectiveness.

We concluded that treatment for schistosomiasis should be considered an important part of SARS-CoV-2 vaccination campaigns where the parasite is commonly found.

## **Impact of schistosomiasis on vaccination**

[Schistosomiasis](#) is a neglected tropical disease which affects more than 236 million people. Most live in Africa.

No direct evidence is available yet on whether SARS-CoV-2 vaccines can be affected by schistosomiasis. But [evidence](#) shows that for viruses such as hepatitis B and measles, the parasite reduces the level of protection given by their specific vaccines. For example, if a person is infected by the [schistosome parasite](#) some time after being vaccinated, they might rapidly lose the immunity provided by the vaccination.

In addition, schistosomiasis commonly causes enlarged liver and spleen, known as [hepatosplenomegaly](#). This condition is associated with weakened immune responses to vaccines in endemic areas.

The efficacy of SARS-CoV-2 virus vaccines might be affected too. If they were, the regions mostly likely to bear the impact would be in sub-Saharan Africa where schistosomiasis is endemic.

## **Strategic efforts**

Our findings call for prompt evaluation of the potential impact of parasitic infections, such as schistosomiasis, on the efficacy of SARS-

CoV-2 vaccines.

The World Health Organisation has endorsed only one drug, [praziquantel](#), to treat and control schistosomiasis disease. In African regions where the disease is endemic, praziquantel is often given annually to vulnerable populations.

[Studies](#) have shown that praziquantel either has no effect on viral vaccine immunity or improves immunity by clearing worms from people with schistosomiasis.

Praziquantel treatment is safe and generally accessible.

Based on our findings we believe there's a case to be made for offering the treatment along with mass SARS-CoV-2 vaccination campaigns where schistosomiasis is endemic.

The other intervention that's needed is that [current disruptions](#) of mass praziquantel administration should be addressed.

Disruptions were understandable in the early stages of the pandemic. But it's now critical to maintain past successes against the parasite. And it could be vital to the success of vaccination against the SARS-CoV-2 virus.

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