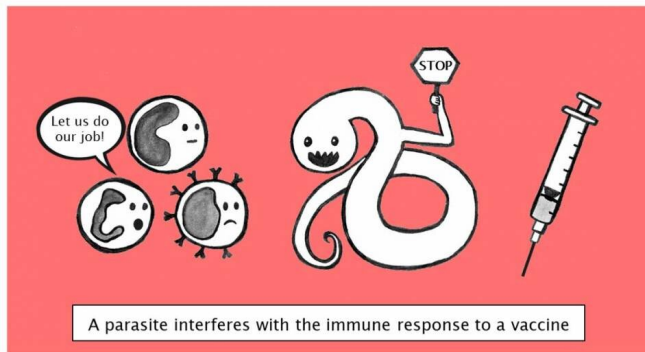


The worm in the bud: Do parasites interfere with immunization?

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Parasites do tend to interfere with the immune system's response to a vaccine, report a team of Princeton ecologists who reviewed and analyzed the literature of parasitic infections and vaccinations. Credit: Liana Wait, Department of Ecology and Evolutionary Biology

Vaccines are one of the most important tools we have in our defense against infectious diseases, but not everyone responds to vaccination in the same way. Parasites such as worms and viruses change the way a person or animal's immune system functions, and this can affect their ability to respond to vaccines.

Since the 1960s, a steady stream of studies examined whether parasites might be interfering with immunization. Some have shown that they do, while others have been inconclusive. Our study, published in the July 31 issue of *Vaccine*, reviews the literature on parasite-[vaccine](#) interactions and quantitatively exposes patterns in these interactions.

Overall, we found that [parasitic worms](#), protozoa and viruses do tend to interfere with immunization.

We found that the timing of [infection](#) relative to vaccination is important: For example, chronic worm infections were more likely to result in worse

immunization outcomes than acute worm infections. The type of vaccine was also important: Vaccines that rely on T-cells were more likely to be blunted than vaccines that do not require T-cell involvement. Our results were consistent in a broad range of studies for various hosts and across various different types of vaccines. All of this points to the strength and importance of these interactions when considering the efficacy of mass vaccination schemes for a wide variety of infections, including influenza and COVID-19.

To discover all of this, we collated and analyzed studies that asked the question: Do parasites interfere with vaccination? We intentionally included both experimental and [epidemiological studies](#), studies in both human and other mammalian hosts, and we defined parasite broadly to include helminths (worms), protozoa, viruses and bacteria.

Our findings are of importance to vaccine designers, [medical practitioners](#) and public health officials, because the potential presence of parasite infections needs to be taken into account when we are designing vaccines, administering vaccines to individual patients and implementing population-scale vaccination programs. Nearly a quarter of the world's children are infected with parasitic [worms](#) such as roundworm and hookworm, so we expect that the efficacy of broadscale attempts to use vaccines to control common childhood infections such as measles, mumps and rubella will be reduced because of these worm infections.

More information: Liana F. Wait et al. Do parasite infections interfere with immunisation? A review and meta-analysis, *Vaccine* (2020). DOI: [10.1016/j.vaccine.2020.06.064](https://doi.org/10.1016/j.vaccine.2020.06.064)

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