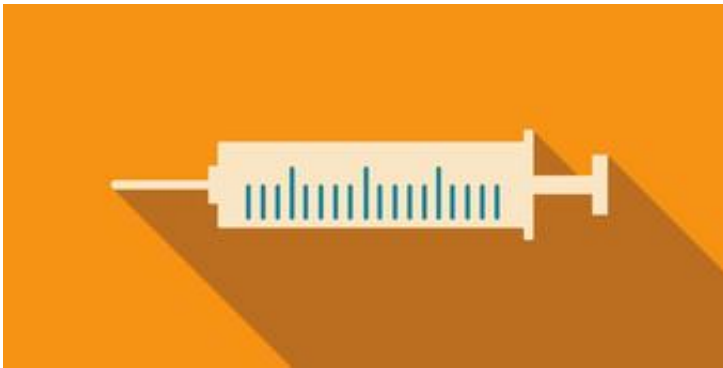


# Hybrid vaccination protocol could cut whooping cough cases by 95 percent

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Whooping cough is making a major comeback in the United States right now, and public health officials are struggling with what to do about it. Now, two SFI researchers have a surprising proposal: go back to an old vaccine—one that was largely abandoned 25 years ago because of relatively minor side effects—but do it for just the first of the usual five doses. Doing so, they says, could cut pertussis cases by 95 percent and save \$142 million per year.

Infection rates for [pertussis](#), the bacteria that causes whooping cough, dropped dramatically once the original, whole-cell pertussis [vaccine](#) first arrived in the 1950s. The trouble was, it caused rare but still rather unpleasant side effects like rashes, inconsolable crying in infants, and fevers. When acellular vaccines with fewer side effects were developed

in the 1990s, it seemed like a good thing.

It wasn't, according to two former SFI Omidyar Fellows, Ben Althouse and Sam Scarpino. They recently showed that the [acellular vaccine](#) doesn't prevent infection and transmission as well as researchers had thought, and infections have gone up since its adoption. Way up.

"There were more cases of symptomatic pertussis in the US in 2012 than there have been since we started using the whole-cell vaccine in the 1950s," Althouse says. "Last year, California saw the most cases of pertussis since they began keeping track in the 1940s."

Althouse, Scarpino, and colleagues had an idea. They'd noticed that some kids born in the early 90s got the whole-cell vaccine for their first shots at two months old but were switched to the acellular vaccine for their usual four followup doses.

"These cohorts had lower prevalences of pertussis than children vaccinated only with the acellular vaccine," says Haedi DeAngelis, an SFI undergraduate researcher, the study's lead author, and a graduate student at New Mexico State University. This suggests that a compromise between whole-cell's efficacy (with some side effects) and acellular's reduced strength (and fewer side effects) could work.

Using standard epidemiological models, modified only to account for differences between the two vaccines, the researchers concluded that a "priming dose" of whole-cell vaccine followed by acellular vaccine for the remaining four shots could slash [whooping cough](#) cases by 95 percent overall and 96 percent in infants.

Their plan makes financial sense, too. "Even accounting for an increase in vaccine-related [side effects](#), which are almost always minor, it would be hugely cost-effective to use a single priming dose, potentially

reducing costs 94 percent and saving up to \$142 million annually," Althouse says.

**More information:** Haedi DeAngelis et al. Epidemiological and Economic Effects of Priming With the Whole-Cell Vaccine , *JAMA Pediatrics* (2016). [DOI: 10.1001/jamapediatrics.2016.0047](https://doi.org/10.1001/jamapediatrics.2016.0047)

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