

Nature Commentary by Dr. Daniel Tancredi Discusses Stunning Protective Effects of Probiotics for Newborns in Rural India

CHPR faculty member, **Daniel Tancredi, PhD**, published a [commentary](#) in *Nature* accompanying a groundbreaking clinical trial evaluating whether a probiotic/prebiotic intervention could prevent life-threatening infections early in life for a sample of mostly full-term newborns in rural India. Tancredi, a statistician and Associate Professor of Pediatrics at UC Davis, explains that serious bacterial infections leading to sepsis are a significant cause of death and disease for newborns in low- and middle-income countries, even for late-preterm and full-term infants. A [double-blind randomized controlled trial by Panigrahi *et al.*](#) studied whether the incidence of serious bacterial infections and sepsis in the first two months of life could be reduced by oral administration of a particular probiotic/prebiotic combination in healthy late-preterm and full-term infants. The trial was stopped midway to the targeted enrollment by independent study monitors, after interim analysis of the data from the first 4,556 infants revealed a stunning 40% reduction in the primary outcome, from 9% in the placebo arm to 5.6% in the treated arm. Dr. Tancredi has well-recognized expertise in the design, conduct, analysis, and reporting of probiotics and prebiotics studies. He was not an investigator on this trial, but peer-reviewed the trial report for *Nature* and was subsequently invited to author a commentary. Although numerous trials have evaluated probiotics for preventing serious infections in pre-term infants, the trial by Panigrahi *et al.* is the first designed specifically to provide a definitive assessment of whether a probiotic preparation could reduce clinical sepsis in a large sample consisting primarily of full-term, healthy infants.

Probiotics are live microorganisms that, when consumed in adequate amounts, confer a health benefit. Prebiotics are molecules such as certain carbohydrates present in human milk or derived from plants that are selectively consumed by host microorganisms, providing a health benefit. The intervention evaluated in this study included an oral daily dose of about a billion units of a strain of *Lactobacillus plantarum* (the probiotic) plus 150 milligrams of fructo-oligosaccharide (the prebiotic), a combination expected to provide a stronger gut barrier to infection and that also appears to have other beneficial effects on the immune system of newborns. Daily doses were administered for just one week. The treatment is inexpensive (~US\$1) and can be administered by parents and caregivers.

In addition to the definitive RCT findings, Tancredi credits Panigrahi and colleagues for conducting crucial preliminary research, developing the infrastructure and securing the necessary resources necessary for a rigorous evaluation of their proposed intervention. Panigrahi and his colleagues had evaluated several probiotic strains in preliminary work, to select one with the most favorable properties for the newborns in the study locations. They also designed the trial to enroll an appropriately large sample to provide a sound statistical basis for judging whether the intervention was effective. Tancredi notes, “Too often, interventions that might plausibly benefit many people are judged to be failures on the basis of under-resourced studies involving too few participants. The estimated effects of an intervention in such studies have large margins of error that prevent definite conclusions being drawn from the findings. Panigrahi and colleagues exemplifies how intervention research should be done.”