

Bacteria on your hands reflect the country you live in

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Credit: AI-generated image ([disclaimer](#))

(Medical Xpress)—Where and how you live strongly influences both the type and number of microbes you carry on your hands, according to a new international study led by scientists at Yale and Stanford.

The research identified and analyzed bacteria on the hands of women in

Tanzania and graduate students in the United States, finding that bacterial populations were more similar among the subjects within a country than between subjects of different countries.

Published May 11 online in the journal *Microbiology*, the study also showed that the subject groups carried typical human skin bacteria in markedly different abundances and that each group carried distinct species.

"Your country, lifestyle, and culture influence your microbiome," said Yale scientist Jordan Peccia, professor of [environmental engineering](#) and the project's principal investigator. "How and where we interact with the environment affects our skin microbiota—which, for hands, can vary dramatically between groups. That's important to know for our health."

The study expands knowledge of the human microbiome and underscores the powerful role of physical environment in determining which microbe species humans host on their skin and in what amounts. The project is among the first skin [bacterial diversity](#) studies to involve subjects from non-Western societies.

The scientists collected and analyzed microbial content from the hands of 29 adult women in Dar es Salaam, Tanzania, and from 15 adult female graduate students in the United States. The Tanzanian women were caregivers for children; the graduate students were not. Researchers analyzed bacterial content and abundance through high-throughput DNA sequencing studies.

Both subject populations contained high concentrations of bacteria commonly found on human skin—Actinobacteria, Firmicutes, and Proteobacteria, for example—but analysis also revealed contrasts in relative abundances and notable differences in bacterial diversity.

Propionibacteriaceae—a family of bacteria commonly associated with human skin—was 40 times more abundant in the U.S. samples, and Staphylococcaceae—also associated with [human skin](#)—was seven times more abundant. In contrast, in the Tanzanian samples, Rhodobacteraceae—associated with soil—was 120 times more abundant than in the U.S. samples.

The U.S. samples had a greater mean diversity of distinct bacterial species—1,240 as compared with 880 for the Tanzanian samples.

On average, the Tanzanian samples carried 11 times more total bacterial cells per square centimeter—386,753 as compared with 34,982 for the U.S. samples.

Said Peccia, "Country was the primary factor for hand microbial diversity differentiation."

His research involves applying microbiology to problems in environmental science and engineering. A 2012 study he led showed that a person's mere presence in a room can add 37 million bacteria to the air every hour, material largely left behind by previous occupants and stirred up from the floor.

The new paper is titled "Hand bacterial communities vary across two different human populations."

More information: D. Hospodsky, A.J. Pickering, T.R. Julian, D. Miller, S. Gorthala, A.B. Boehm, J. Peccia. 2014. "Hand bacterial communities vary across two different human populations" *Microbiology*.

Provided by Yale University

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