



LETTER TO THE EDITOR

Post-pandemic concerns about our microbiome

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Our species has coevolved with the trillions of microbes that inhabit our bodies and are perfectly attuned to the host's physiology (Lloyd-Price et al. 2016). The composition of microbiomes depends on the host's genetics, diet, antibiotic use, and lifestyle, and the combination of these factors causes every human to develop a unique microbial signature that varies over time and between different niches in the human body (Gilbert et al. 2018).

Most of the microorganisms we host are commensals and belong to different taxa, occupying various parts of our bodies (gut, skin, genitals, etc.); for instance, the human skin is colonized by various microorganisms (fungi, archaea, bacteria, and viruses) and mites (Kong 2011). Many microorganisms inhabiting the different skin niches act as mutualistic symbionts protecting the host against invasion by pathogenic microorganisms (Grice & Segre 2011). Nonetheless, as an interface with the external environment, the skin is subject to disturbances that affect microbial dispersal and re-colonization of the human body's different environments and, perhaps, the most dramatic impact is on the microbiome of the hands and gut.

The current hypothesis of hygiene or the disappearance of the microbiota assumes that modern human habits (intensified hygienic practices, reduced fiber intake, excessive antibiotic use, widespread consumption of industrialized products, etc.) are responsible for the ongoing loss of gut microbial diversity among a large segment of the world's population (Finlay et al. 2021). Today's big question lies in measuring the impacts of the COVID-19 pandemic on the human microbiome (Figure 1). Hence, several questions are open: (1) Do excessive sanitization of the hands and collective and home environments, reduced people-to-people contact, and lifestyle changes promoted by the current pandemic negatively impact the human microbiome? (2) Do sanitization measures (e.g., frequent hand washing with sanitizing products) arising from fear of contamination with new pathogenic microorganisms affect the diversity of useful functions of our microbiota? (3) Is the current pandemic accelerating the loss of our ancestral microbiome? (4) What are the impacts of restrictive measures on dispersal, re-inoculation, taxon diversity, and the functionality of the human microbiome?

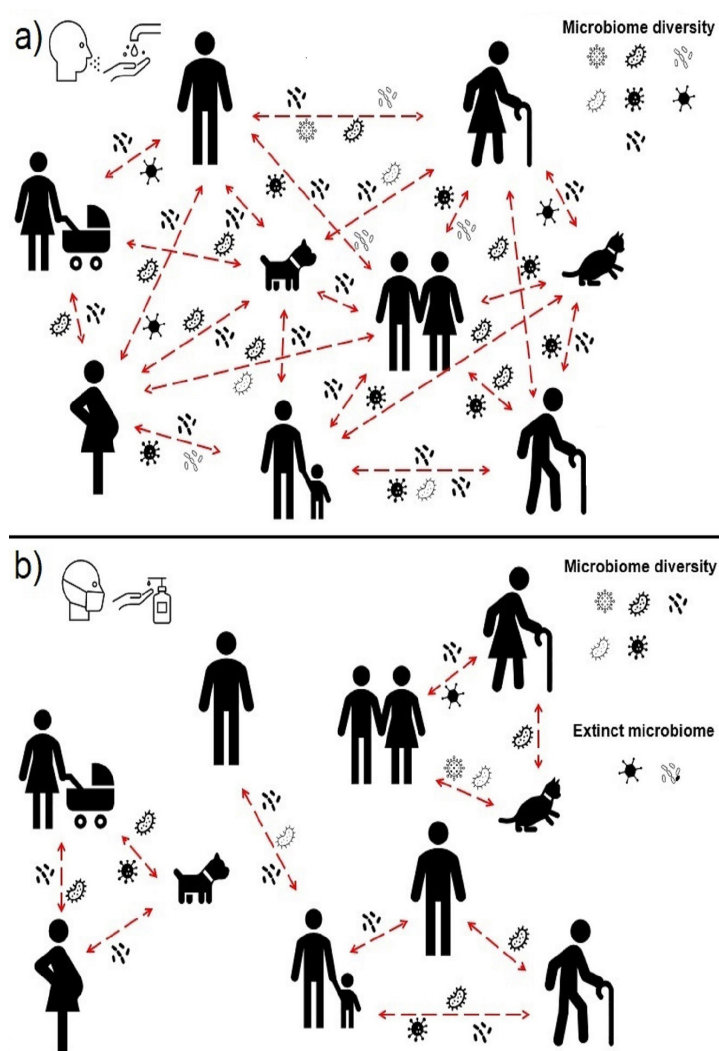


Figure 1. Dispersion, re-inoculation, and diversity of the human microbiome before a) and after b) the COVID-19 pandemic. Red lines indicate the level of social contact between individuals and the consequent dispersion of microorganisms. The different microorganisms in the figure indicate the diversity of the human microbiome. The social isolation caused by the COVID-19 pandemic could reduce the dispersion of commensal microorganisms and, thus, result in the loss of biodiversity in the human microbiome.

We believe that the social and economic changes produced by the COVID-19 pandemic will change our perceptions of the human microbiome, and answering the questions raised above is one way of shedding more light on what the future will hold for the relationship with our microbiome.

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How to cite

RAMOS RF, RODRIGUES AS, SOBUCKI L, DE ANDRADE N & JURELEVICIUS DA. 2022. Post-pandemic concerns about our microbiome. An Acad Bras Cienc 94: e20211513. DOI 10.1590/0001-376520220211513.

*Manuscript received on November 20, 2021;
accepted for publication on January 16, 2022*

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