

# Study reveals surprising link between malnutrition and rising antibiotic resistance

Researchers have uncovered startling connections between micronutrient deficiencies and the composition of gut microbiomes in early life that could help explain why resistance to antibiotics has been rising across the globe. The team investigated how deficiencies in crucial micronutrients such as vitamin A, B12, folate, iron, and zinc affected the community of bacteria, viruses, fungi and other microbes that live in the digestive system. They discovered that these deficiencies led to significant shifts in the gut microbiome of mice most notably an alarming expansion of bacteria and fungi known to be opportunistic pathogens. Importantly, mice with micronutrient deficiencies also exhibited a higher enrichment of genes that have been linked to antibiotic resistance.

The team investigated how deficiencies in crucial micronutrients such as vitamin A, B12, folate, iron, and zinc affected the community of bacteria, viruses, fungi and other microbes that live in the digestive system. Micronutrient deficiency has been an overlooked factor in the conversation about global antibiotic resistance," "This is a significant discovery, as it suggests that nutrient deficiencies can make the gut environment more conducive to the development of antibiotic resistance, which is a major global health concern."

This poses a threat that could render many potent antibiotics ineffective and lead to a future where common infections could become deadly. Antibiotic resistance is often attributed to overuse and misuse of antibiotics, but the work of Dr. Little John and colleagues suggests that the 'hidden hunger' of micronutrient deficiencies another important factor.

"Globally, around 340 million children under five suffer from multiple micronutrient deficiencies, which not only affect their growth but also significantly alter their gut microbiomes"

"Our findings are particularly concerning as these children are often prescribed antibiotics for malnutrition related illnesses. Their gut microbiome may be primed for antibiotic resistance due to micronutrient deficiencies." The study, published in Nature Microbiology offers critical insights consequences of micronutrient deficiencies in early life. It would be necessary to find global strategies to combat under nutrition and its effects on health. Addressing micronutrient deficiencies is about more than overcoming malnutrition, it may also be a critical step in fighting the global scourge of antibiotic resistance.

<https://www.sciencedaily.com/releases/2023/11/231117134925.htm>

## Quelques définitions

**Microbiote intestinal** : 57 espèces communes à > 90% des individus,

- **Bacteroidetes (bactéroïdes)**
- **Firmicutes (clostridia, lactobacilles ou bifido bactéries)**
- **Actinobacteria**

Unique pour chaque individu : véritable signature individuelle

**Microbiome**: ensemble de gènes de l'écosystème microbien intestinal (bactéries, bactériophages, protozoaires, levures, virus,...).

# Le microbiote intestinal

100 000 milliards de bactéries vivant dans l'intestin



## Fonctions :

- digestive
- métabolique
- immunitaire
- neurologique

## Propre à chaque individu :

**160 espèces**  
de bactéries  
environ par individu

*La moitié se retrouve  
d'une personne à l'autre*

**15 à 20 espèces**  
en charge  
des fonctions  
essentielles  
du microbiote



## Participent à

- ➔ Assimilation des nutriments
- ➔ Synthèse de vitamines
- ➔ Absorption des acides gras, calcium, magnésium, etc.

## Déséquilibres du microbiote

*peuvent être des facteurs  
favorisant :*

Maladies neuro-  
psychiatriques

Obésité

Diabète

Cancer

Maladies  
intestinales  
chroniques

