

NYUAD research explains why malaria hits certain groups less severely

Malaria resistance traced to unique immune responses in African communities

ABU DHABI, UNITED ARAB EMIRATES, May 27, 2025 /EINPresswire.com/ --While most global health and genomic studies focus on widely represented ethnic groups, the impact of ethnic diversity on disease response, particularly malaria, has been underexplored. NYUAD CGSB

Ethnic differences in susceptibility to malaria: what have we learned from immuno-epidemiological studies in West Africa?

To address the gap and understand how different under-represented

populations respond to malaria, researchers at NYU Abu Dhabi and their collaborators in Burkina Faso studied immune response differences between the Fulani and Mossi communities in rural Burkina Faso, investigating why the Fulani group exhibits stronger protection against malaria.

The team analyzed blood samples from 126 children, including both infected and uninfected individuals. Using single-cell transcriptomic profiling, a technique that examines gene activity in individual immune cells, researchers studied over 70,000 cells and identified 30 distinct immune cell subtypes.

They found that specific immune cells from Fulani children showed lower levels of inflammation, which may help reduce the harmful effects of infection. In contrast, their B cells, which play a key role in producing antibodies against infections, were more active.

The researchers also examined how genes are regulated during infection. They identified specific DNA changes, known as regulatory variants, that affected immune-related genes, and these effects varied between the two groups. "We identify ethnic, cell-type-specific, and genetic regulatory effects on host immune responses to malaria," the researchers wrote in the study that was published in The American Journal of Human Genetics.

The results provide new insights into why certain populations are less susceptible to malaria than others, underscoring the importance of including diverse groups in health and disease studies.

Lead researcher Tala Shahin, Ph.D., a postdoctoral associate in NYUAD's Idaghdour Lab, specializing in immuno-genomics, said, "Our research—built on two years of intensive fieldwork studying Fulani and Mossi children—highlights the power of leveraging genetic and lifestyle diversity in Africa to uncover novel biological insights, underscoring the importance of empowering underserved populations in genomic studies."

"Variation of immune responses to malaria across populations highlights the need for vaccines to account for genetic and ethnic differences. Tailoring vaccine design to population-specific immune profiles will improve effectiveness and ensure broader protection," said Youssef Idaghdour, Associate Professor of Biology at New York University Abu Dhabi and one of the study authors.

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