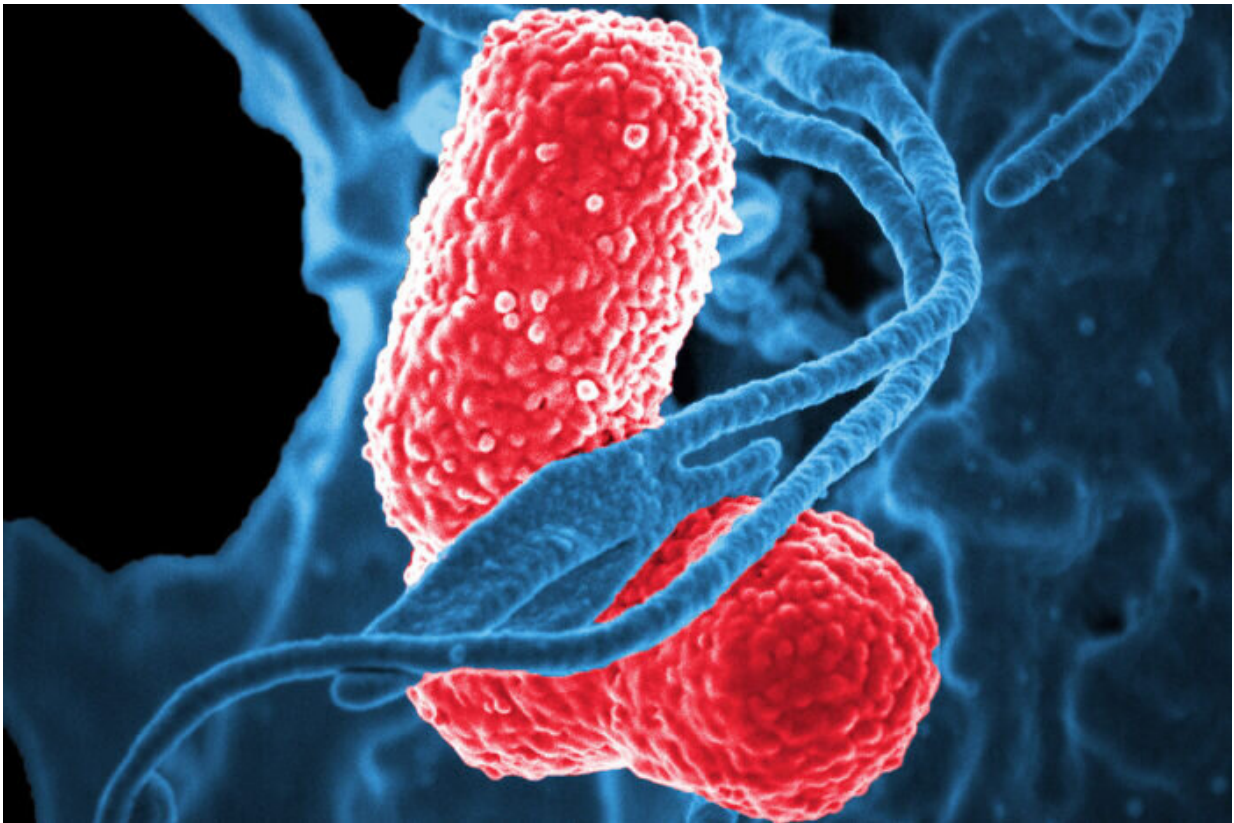


Antibiotic-resistance in sub-Saharan Africa 'alarming': Studies

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White blood cells (blue) attack two Klebsiella bacteria (pink) in this colorized scanning electron microscopic image. Credit: David Dorward/NIAID

Superbug infections are taking a disproportionate toll in sub-Saharan Africa where there is "extremely concerning" levels of multi-resistant

bacterial strains among young children, two studies warned Thursday.

The World Health Organization has declared [antimicrobial resistance](#), which occurs when [bacteria](#) become immune to antibiotics, a global health crisis.

Analyses carried out by Geneva University Hospital (HUG) and the University of Geneva (UNIGE) concluded that the situation in sub-Saharan Africa was particularly "alarming".

"We observed a strong proportion of antibiotic resistant bacteria, in particular those found in the blood of young patients," explained Noemie Wagner, at HUG's pediatric infectiology unit.

Both analyses focused on Enterobacteria, which are found in the [digestive tract](#) and are known for their ability to develop antibiotic resistance.

They are responsible for the most invasive infections in newborns in the region, researchers said.

The first analysis evaluated [antibiotic-resistant bacteria](#) found in the blood of young [children](#) in the region during infections.

The results suggested "a very high level of resistance to first-line and second-line antibiotics recommended for treating child sepsis", the researchers said in a statement.

The most common strains identified were E.coli and Klebsiella spp, which showed considerable resistance to the first-line antibiotics recommended for sepsis -- ampicillin and gentamicin.

'Very high'

The analysis reviewed over 1,000 studies published since 2005 and conducting an in-depth meta-analysis on 122 of them.

It found that 92.5 percent of E.coli found in the blood of children with [infection](#) were resistant to ampicillin and 42.7 percent to gentamicin.

The Klebsiella spp strain is always resistant to ampicillin, and the study showed 77.6 percent were also resistant to gentamicin.

The analysis indicated very high proportions of resistance to cephalosporin, a third-generation antibiotic considered a second-line treatment for sepsis in children.

The aim of the second study was to estimate the prevalence of children "colonized" by cephalosporin-resistant Enterobacteria -- meaning the bacteria is present in their stool when there is no infection.

Following an analysis of 40 studies, representing more than 9,400 children, the researchers determined that nearly a third were carriers of Enterobacteria resistant to wide spectrum cephalosporins.

"These proportions are very high and concerning," said Annick Galetto-Lacour, at HUG's pediatric admissions and emergency division.

If first and second-line treatments fail, "treatment options are often not available in this region", she pointed out.

'Vicious circle'

The study revealed that more than half of children who were not carrying resistant Enterobacteria when they were admitted to hospital tested positive for these bacteria when discharged.

It also showed that the risk of becoming a carrier of resistant Enterobacteria ballooned three-fold for those who had received antibiotic treatment in the previous three months.

This worries specialists as basically all hospitalized children in sub-Saharan Africa are systematically treated with antibiotics.

"As bacterial infections are the main cause of death in this region, children are very often treated with antibiotics when they are admitted to hospital, even if there is no strong argument for a [bacterial infection](#)," Wagner said.

And most [medical facilities](#) have no access to tests needed to distinguish a bacterial infection, which requires antibiotics, from a viral infection, which does not.

"It's a vicious circle," Wagner said.

"Improper use of antibiotics increases the proportion of resistant bacteria, which then will be more difficult to treat."

More information: Morgane Kowalski et al, Antimicrobial resistance in Enterobacterales infections among children in sub-Saharan Africa: a systematic review and meta-analysis, *eClinicalMedicine* (2024). [DOI: 10.1016/j.eclinm.2024.102512](https://doi.org/10.1016/j.eclinm.2024.102512)

Micaela Ruef et al, Carriage of third-generation cephalosporin-resistant and carbapenem-resistant Enterobacterales among children in sub-Saharan Africa: a systematic review and meta-analysis, *eClinicalMedicine* (2024). [DOI: 10.1016/j.eclinm.2024.102508](https://doi.org/10.1016/j.eclinm.2024.102508)

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