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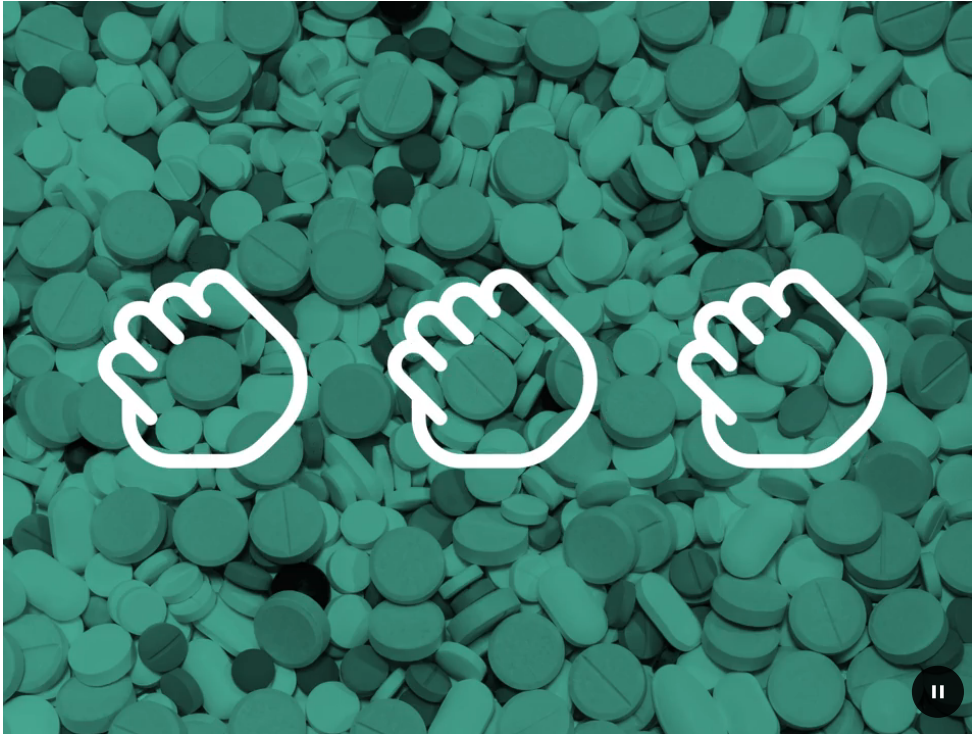
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MARYN MCKENNA

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## The Catch-22 of Mass-Prescribing Antibiotics

Researchers have found that seemingly unnecessary drugs are saving lives in the developing world. Is that worth the threat of antibiotic resistance?



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A DECADE AGO, a group of researchers were studying how best to prevent trachoma, a blinding bacterial infection, in clusters of [villages in Ethiopia](#). They stumbled on a surprising result. Preventing trachoma requires periodic doses of [antibiotics](#), and kids who received the drugs were surviving to their sixth birthday, in an area where death by the age of five is shockingly common.

“We thought, ‘Let’s follow up on this,’” says Thomas M. Lietman, an infectious disease ophthalmologist at the [Francis I. Proctor Foundation](#). In 2014, he and his colleagues began a four-year study of whether giving the antibiotic azithromycin twice a year would protect children from dying young. Two weeks ago, in [The New England Journal of Medicine](#), they reported that the answer is



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the drugs and become resistant.

The trial's unexpected results are forcing researchers and bioethicists to examine a stark choice: Is the survival of a small child in one part of the world worth a death from a drug-resistant infection in another? Does the threat of antibiotic resistance—called "the greatest and most urgent global risk" by the former Secretary General of the United Nations—require withholding a treatment that could literally save lives?

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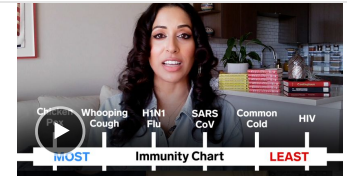
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This debate is familiar territory to trachoma researchers, including those at the Proctor Foundation, which works to prevent blindness. The damage the disease does to the eyes comes from inflammation and scarring from repeated infections—so, to prevent it, international health agencies and their philanthropic partners routinely give annual doses of azithromycin to children in affected communities.

During those campaigns, researchers have observed resistance emerging—not in the organism that causes the disease, Chlamydia trachomatis, but in other common pathogens, Streptococcus pneumoniae and E. coli, that happened to be present in kids' bodies when they received the drugs. So the hope implied by the study's finding—that if antibiotics were administered universally, they could broadly save kids' lives—drags behind it the fear of creating much more antibiotic resistance.

Lietman acknowledges this; he and his coauthors note in their paper that the "potential for the induction or amplification of antibiotic resistance" would have to be considered before the findings were spun up into policy.

I asked Lietman if he felt the study's findings defy the medical norm of not



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last at 3.4 percent. That difference may be explained simply by Niger's especially high childhood mortality rate. But the findings are so striking that, Lietman says, international health agencies have been "surprisingly interested" in putting the findings into practice soon.

That prospect is deeply alarming to scientists who track antibiotic resistance, even as they acknowledge what's at stake.

"My first response to this was to be terrified," says Lance Price, the director of the Antibiotic Resistance Action Center at George Washington University and a leading researcher into mass administration of antibiotics in agriculture. "It's so tantalizing, potentially saving children's lives—who wouldn't want to do that? I could see how this could be very tempting."

The problem isn't just the risk of resistance. As multiple observations have proved, resistance that arises in one species of bacteria can migrate through the microbial world, passed on from pathogen to pathogen like a gambler trading away a card. That raises the possibility that disease organisms could acquire azithromycin resistance unpredictably.

And we badly need azithromycin to work. Among other things, it's one of the few treatments left to which gonorrhea still responds. Gonorrhea is rapidly becoming pan-resistant—last month, a British man with "super-gonorrhea" was cured only with a rarely used intravenous drug—and gonorrhea that can't be treated can cause pelvic inflammatory disease, infertility, and bone and joint disorders.

The possibility of having to judge the immediate survival of children versus the future survival of victims of resistance highlights that, across societies, antibiotics don't have equal value. In the industrial West, we've moved through antibiotics, taking them for granted and using them up. In the global South, some societies are still waiting to obtain them.

"In these communities in Niger, these kids aren't seeing doctors," Lietman says. "They don't die in the hospital, they die at home. From common infections. Why would you worry about antibiotic resistance when you don't have access to antibiotics in the first place?"

Which is why global health agencies will likely take these findings seriously. If mass distribution campaigns were created out of this discovery, it wouldn't be the first time antibiotics were broadly given to children in the developing world; the World Health Organization does that already for severe malnutrition as well as for trachoma. But it could be the largest such campaign. So researchers are urging health planners to proceed cautiously.

"I am not saying this kind of use has no place at all; it may have a role for some populations and for some period of time," says Ramanan Laxminarayan, the founder of the Center for Disease Dynamics, Economics and Policy and a prominent researcher into developing-world antibiotic policy. "But we have to also be working on water, sanitation, nutrition. This can be a stopgap, but it cannot be an endless strategy for saving children's lives."

But building sanitation systems and bringing in clean water is slow and hostage to political commitment, foreign funding, and corruption. Lietman has observed



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[Maryn McKenna](#) is a senior writer at WIRED covering health, public health and medicine, including the Covid pandemic, and a faculty member at Emory University's Center for the Study of Human Health. Before coming to WIRED she freelanced for magazines in the US and Europe including Scientific American, Smithsonian, The... [Read more](#)

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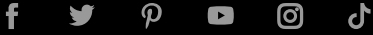
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