



# From the toilet into the environment



Photo: © Andrew Shiva

Where the infrastructure is poor, particularly large amounts of antibiotics end up in the environment

## INVISIBLE DANGER



Photo: © JMK

*The effects of antibiotic residues in the environment are unpredictable. They are most likely partly responsible for the emergence of extremely resistant tuberculosis pathogens and other multi-resistant germs.*

In South Africa's poor neighbourhoods, numerous households are not connected to the sewer system. Many people who live there suffer from tuberculosis or other diseases and have to take antibiotics. Antibiotic residues and resistant pathogens enter the environment with human excreta.

**“With regard to antibiotic-resistant germs, the continuous discharge of antibiotics from sewage-treatment plants into bodies of water is a huge concern for public health.”**

*Sara Rodriguez Mozaz, Spanish researcher*



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## ONE HEALTH

South Africa is committed to the One Health approach. An advisory panel on antibiotic resistance has been set up with experts representing various disciplines. Together, they decide what needs to happen in South Africa to protect human, animal and environmental health.



## WHO'S GOT DIRT ON THEIR HANDS?





# IS THAT CLEAR



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### AN ACCIDENT WITH CONSEQUENCES

*Recently, a man nearly drowned in a stream – but then died a few days later in a Frankfurt hospital. In his lungs the doctors found water, foliage and extremely dangerous germs – and there was virtually no antibiotic that worked against them. Parts of the intensive care unit had to be closed because the resistant germs had spread. A later investigation revealed that the stream itself was teeming with multi-resistant bacteria.*

Antibiotics and resistant germs flow into the sewage system in the effluent from factory farms, slaughterhouses, clinics and nursing homes. Sewage-treatment plants can't completely eliminate them, so they end up in rivers and lakes. Liquid manure that is sprayed onto the fields can also contain resistant germs.

**“Most medications are designed to have as long an effect as possible in our bodies. The problem is that they don't break down very easily in the environment either.”**  
*Julia Steinhoff-Wagner, agricultural expert, University of Bonn*

### SWIMMING WITH GERMS?

Most bathing lakes in Germany are not (or only slightly) contaminated with resistant bacteria. But things are different near sewage-treatment plants that treat effluent from hospitals or animal factories. Germany also needs stricter legal regulations and better monitoring. And polluters should be held more accountable.



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# Making antibiotics for the world market



The Musi river in Hyderabad is highly polluted with effluent from pharmaceutical factories

**RESISTANT GERMS IN DRINKING WATER**

*Many local residents collect their water straight from rivers where antibiotics factories discharge their effluent. Even the ground and drinking water around Hyderabad is contaminated. The only exception is the tap water in a four-star hotel.*



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More than 30 factories produce antibiotics near Hyderabad in India. The effluent contaminates lakes and rivers, where the concentration of antibiotic residues and resistant germs is extremely high.

**“Antibiotics shouldn’t be allowed to enter the environment. It makes the resistance problem even worse!”**

*Christoph Lübbert,  
Leipzig University Hospital*



## A NEW LAW

A draft law in India aims to lay down maximum levels for antibiotic agents in effluent from pharmaceutical factories. If the law is passed, many companies will have to retrofit their factories. These include subsidiaries and suppliers of European corporations.



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# Antibiotics in the garbage



Insufficient sewage and garbage management promotes resistance

### POLLUTED WASTE-WATER

80% of waste-water worldwide enters the environment untreated. This makes the resistance problem worse. Poor countries in particular lack the resources for proper waste disposal and sewage-treatment plants

In Tanzania, untreated sewage is heavily contaminated with resistant germs. A lack of sewage treatment and incorrect disposal of antibiotics are major problems. Even in hospitals, antibiotics are often just flushed down the toilet or disposed of with the regular trash.

“The spread of antibiotic resistance in the environment is a sensitive issue. It ultimately also threatens the effectiveness of the antibiotics we use to treat human disease.”  
*Erick Venant, pharmacist, Tanzania*



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### IMPROVE WASTE-WATER TREATMENT TECHNOLOGY

Developing a sustainable water-supply and sanitation system – as well as sewage-treatment plants – is good for the environment and protects people from resistant germs.

Improving access to the corresponding technologies should also be seen as a challenge for German development policy.

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