

## Anti - Microbial Resistance

High-quality water and sanitation are low-cost solutions to the humanity's gravest health threat

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Clean, safe and well-managed water is fundamental to public health. Where water is unclear or sanitation poor, life-threatening diseases such as cholera and typhoid can take root. And where water is unregulated or enforcement lax, contamination from chemicals, pathogens or excreta is a persistent risk. Poor hygiene, meanwhile, exacerbates each of these problems, amplifying one of humanity's gravest health security threats: antimicrobial resistance (AMR).

AMR occurs when the effectiveness of antimicrobial drugs - including antibiotics - is diminished due to mutations in infectious bacteria. This happens when antibiotics are ill-regulated and overused, or when they are used inappropriately or for non-human health. Bacterial mutations and the superbugs they create make treating basic infections such as skin sores or diarrhoea next to impossible. They also make surgery risky. Around 7,00,000 people across the globe already die of AMR each year. If present trends persist, by mid-century AMR will kill more people than cancer.

So where does water, sanitation and hygiene come in ?

To start with, poor sanitation and unsafe water causes a range of bacterial infections that heighten antibiotic usage. Though access across the Southeast Asia region to improved water sources is now at 90%, poor operation and maintenance of water and sanitation systems continues to be a fact of life for many. Millions of people region-wide remain susceptible to water-borne diseases, with high rates of infection compounded by self-medication and inappropriate antibiotics use.

Next, poor water, sanitation and hygiene (WASH) in healthcare facilities is a cause of hospital-acquired infections that accelerate bacterial mutations. Just 38% of healthcare facilities in low- and middle-income countries have rudimentary WASH amenities, resulting in the incubation of a range of deadly pathogens. It is no coincidence that some of the most vicious antibiotic-resistant bacteria, including NDM1 and MRSA, emerged from healthcare settings.

And finally, ill-regulated waste water is scattering antibiotic residues and antibiotic-resistant bacteria throughout the environment, including in drinking water and the food chain. Across the region contaminated wastewater from homes, hospitals, pharmaceutical industries, nursing homes and livestock farms is finding its way into natural water sources, as well as soil

and crops. This is hastening the spread of antibiotic resistant pathogens, and increasing human antibiotic consumption.

As countries finalise National Action Plans to counter AMR, a return to core WASH principles is needed. By including WASH in multi-sectoral planning, and staying true to a 'One Health' approach, governments can neutralise one of AMR's key accelerators and help reverse AMR's growing menace. And they can do so in a way that is cost-effective and has a range of other public health benefits.

There are three interventions that will have immediate impact.

First, governments can hasten efforts to achieve safe water and sanitation for all. Communities lacking clean water and effective sanitation should be identified in both rural and urban areas, and steps taken to ameliorate their situation. This could mean treating water at its point of use or systematising the operation and maintenance of local water supply systems. It could also mean investing water supply systems to serve unreached populations. At the same time, access to safely-managed toilets should be increased by investing in and building them, and by promoting behavioral change aimed at ending open defecation.

Second, WASH amenities and training can be enhanced at all healthcare facilities. This can be done by ensuring each facility has a safe and adequate water supply, and that toilets and medical waste management facilities are in or near it. Hand-washing stations should be readily accessible at key points of care, and healthcare workers should be trained in WASH procedures as part of wider infection prevention and control initiatives. To this end, WHO's Clean Care is Safer Care programme is essential resource, and can be integrated with national policies.

And third, regulation and treatment of wastewater can be vastly improved. To do so, investing in water management and treatment infrastructure is crucial, while creating public-private partnerships able to extend service coverage may also be effective. Key contaminators such as hospitals and pharmaceutical plants can meanwhile be encouraged—or required—to develop onsite treatment plants able to neutralise antibiotics and resistant bacteria. Wastewater used in aquaculture and agriculture should also be better regulated to keep

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