

# WATER AND HEALTH

## Uniting water, sanitation, and health policy for lasting impact against neglected tropical diseases

*For millions of South Africans, contact with rivers, dams, and informal water sources is part of everyday life. What often goes unnoticed is that these same waters can carry hidden health risks. Neglected tropical diseases thrive where unsafe water, poor sanitation, and inequality meet, quietly undermining health, learning, and livelihoods. Dr Eunice Ubomba-Jaswa from the Water Research Commission, Prof Paula Melariri and Prince Campbell of Nelson Mandela University highlight these often-overlooked infections.*



Why do neglected tropical diseases (NTDs) still demand national attention? NTDs are caused by a range of parasites, bacteria, viruses, and toxins. Many depend on environmental conditions to spread, often involving insect vectors, animal hosts, or contaminated water. Their impacts are long-lasting, contributing to chronic illness, disability, missed school days, reduced economic productivity, and entrenched inequality. Despite being largely preventable and treatable, these diseases often persist quietly, overshadowed by more visible health priorities.

South Africa may not be geographically tropical, but structural inequality, water insecurity, sanitation challenges, and more frequent extreme weather events leave large parts of the

country vulnerable to NTDs.

The Department of Health currently recognises four NTDs of public health concern: soil-transmitted helminths (worms), bilharzia (schistosomiasis), leprosy, and rabies. Emerging evidence also suggests that other diseases, such as echinococcosis (tapeworm larvae infection), may be more widespread than previously understood, underscoring the need for regular review of national disease priorities.

### **When everyday water use becomes a health risk**

Bilharzia offers a clear example of how environmental conditions shape disease risk. The infection is caused by parasitic worms

whose lifecycle depends on freshwater snails. People become infected through skin contact with contaminated water.

Globally, bilharzia affects around 240 million people, and more than 700 million live in areas where the disease is endemic. It is the second most common parasitic disease in Africa after malaria. In South Africa, prevalence among children in some endemic areas has been estimated to reach up to 95%. Endemic provinces include Limpopo, Mpumalanga, Gauteng, KwaZulu-Natal, and the Eastern Cape.

South Africa has made progress through preventive treatment, including school-based mass drug administration, which reduces infection severity. However, experience on the ground shows that reinfection remains common when treatment is not paired with a reliable water supply, adequate sanitation, snail control, and sustained health education. Evidence also suggests that extending deworming programmes beyond children to include adults would significantly improve long-term control outcomes (see Vere, 2024, <https://tinyurl.com/apd2a8d9>).

### **Building the next phase of South Africa's NTD response**

Against this backdrop, South Africa's National Master Plan for the Elimination of Neglected Tropical Diseases (2019–2025) marked an important milestone. Developed jointly by the Departments of Health and Basic Education, it was the country's first coordinated effort to align disease surveillance, preventive treatment, and cross-sector collaboration under a single framework.

The plan reached the end of its intended cycle last year, presenting an opportunity for reflection, and critically, renewal. Since its launch, South Africa has faced increased pressure on water and sanitation systems, severe weather conditions, and rapid urban expansion – all factors that influence how NTDs spread and persist. While the WHO 2021–2030 NTD Roadmap offers interim global guidance, an updated and strengthened national master plan would allow South Africa to respond more directly to its own changing realities, building on progress while adapting to new risks.

### **Turning water and health research into early warning and prevention**

Water quality is a critical determinant of NTD transmission. South Africa continues to face severe challenges related to dysfunctional wastewater treatment works, water pollution, and unequal access to basic services. Millions of people still lack access to clean, running water, and many more lack adequate sanitation. These conditions create environments where parasites and pathogens can persist and spread.

Research funded by the Water Research Commission (WRC) and led by Nelson Mandela University (NMU) is helping to strengthen South Africa's ability to respond to NTDs. This work focuses on understanding how water, sanitation, and environmental conditions shape disease risk, and on translating evidence into policy interventions and practical tools for prevention and early detection. With the active support of the Department of Basic Education and the Provincial Department of Health in the Nelson Mandela Bay Municipality as end-users, the research demonstrates the power of locally driven, evidence-based approaches to address provincial, national, and regional health challenges.

One completed project developed a decision-support and predictive tool that integrates environmental, biological, and community-level data. The tool enables authorities to predict hidden infections, identify high-risk areas even where reported prevalence is low, and strengthen early-warning systems for disease outbreaks. Importantly, it addresses a major gap in municipal disaster planning, where sanitation damage and disease risks are often overlooked due to infrastructure damage and environmental impact.

The research also developed improved ways to diagnose bilharzia, showing that standard tests often miss infections, particularly in areas where transmission is low but ongoing. By using more sensitive DNA and urine-based tests, health services can detect infection earlier and gain a more accurate picture of the prevalence of bilharzia.

Building on this work, an ongoing WRC-funded One Health project (2024–2027) is embedding environmental water quality and communicable diseases, including NTDs, into Municipal Disaster Management Plans, as required under the Disaster Management Act. By recognising the interconnectedness of human health, animal health, ecosystems, water infrastructure, and climate, the One Health approach strengthens preparedness for outbreaks linked to droughts, floods, and sanitation failures.

### **Skills, data, and locally-owned solutions: what lasting prevention requires**

Beyond data and tools, these initiatives invest in people. Training and interdisciplinary collaboration are building local expertise in environmental health, diagnostics, epidemiology, and community-based research. This growing expertise is essential for ensuring that NTD elimination efforts go beyond short-term projects and are sustained, locally owned, and adaptable to future challenges.

Equally important, the work recognises that infrastructure and information alone do not change behaviour. Community-centred approaches, such as locally relevant storytelling and interactive learning, help close the gap between what people know about hygiene and what they do in daily life. Experience from school-based water, sanitation, and hygiene programmes shows that when children learn these practices early and consistently, the benefits last, making structured WASH education a practical and affordable way to prevent NTDs.

### **A shared responsibility to prevent and eliminate NTDs**

Ultimately, no single sector can eliminate NTDs alone. Success depends on coordinated action: policymakers renewing strategies and prioritising NTDs; researchers generating relevant evidence; water and sanitation sectors addressing root causes; communities and civil society driving awareness and behaviour change; and funders, including the private sector, investing in long-term solutions.

The message is clear. NTDs must move from the margins to the mainstream of public health and development planning. Renewing the national NTD master plan, investing in water and sanitation, using science-based tools, and embracing One Health approaches are not optional – they are essential.

With evidence, innovation, and collaboration, South Africa can transform neglected diseases into prevented diseases and neglected communities into protected communities.