



# Rapid Water Quality Testing



unicef  
for every child

Supply Division



## Overview

### The challenge

Clean water is something many people take for granted. When they're thirsty they simply turn on a tap or open a bottle of water without even thinking about it.

However, [2.2 billion people around the world do not have access to safe drinking water](#). Unfortunately, many rely on water contaminated with bacteria like *E. Coli*.

This can cause illness and death especially in young children, with over 700 children under five dying every day from diarrhoea linked to inadequate water, sanitation and hygiene.

UNICEF works with governments and communities to test household and community water sources for faecal contamination, measured by testing for *E. Coli* bacteria in water samples\*.

However, current testing approaches suitable for field use are time consuming, taking 18-24 hours to return a result. The equipment is bulky to carry to remote locations, highly complex to use and requires trained professionals. In addition, in remote settings where UNICEF works there is limited access to labs, electricity and cold chain transport.

Due to the long processing time, communities often do not get to see the results which limits the ability to understand and communicate risks, launch community-led water quality monitoring programmes, and integrate water testing into large-scale national household surveys.

### The response

UNICEF is calling on industry to develop an easy-to-use, rapid detection method or portable kit that can accurately identify faecal contamination in drinking water.

This would empower individuals and local communities to monitor and manage their water quality, ensuring their own health and safety. Data collected on unsafe water would also enable governments to make evidence-based policies and take timely, preventative actions at a national scale.

In 2016, UNICEF launched a [Target Product Profile](#) (TPP) which outlines the specifications required for a new testing system. TPPs communicate requirements for products that are currently not available but fulfil a need in the unique context UNICEF and partners operate.

Already, early prototypes have cut the testing time from 24 hours to 10 hours. However, the ideal solution is under six hours, which would allow UNICEF to run same-day behaviour change programmes and take preventative action immediately.

### The impact

A rapid test can support governments and communities to massively scale up testing of water sources. This will provide more information on water quality so it can be treated, identify areas for improvement, and monitor progress towards SDG 6.

This will mean more children have access to safe drinking water, ensuring better health outcomes and avoiding thousands of preventable deaths in young children each year.

## Key figures

### The challenge

**2.2 billion people** around the world lack safe drinking water.

### 700 children

under the age of five die every day from diarrhoea linked to inadequate water, sanitation and hygiene.

Many more children miss school because the water they drink makes them sick.

### The response

#### 24 hours

Current water tests can take 24 hours to provide a result and must be operated by trained specialists.

#### 10 hours

Working with industry, UNICEF has identified potential products that can return a result within 10 hours, but faster tests are needed.

\*in line with the World Health Organization recommendation for testing water



**If a rapid, easy-to-use and accurate test could be developed, we could drastically decrease the number of children drinking contaminated water, saving thousands of lives.**

## Need for the product

If a suitable product existed, the potential demand would be huge. Each year UNICEF supports approximately 100 national-scale household water quality surveys monitoring progress towards access to safe water, these require at least 1 million tests per year for this purpose alone. In addition, UNICEF would use the product in behavioural change programmes, implemented in many of the countries where UNICEF works.

## Current use in field

### Data collection to inform policy and programmes

Household surveys are used to collect data on key development indicators for health, nutrition, education and water and sanitation. National survey teams visit 1,000 to 20,000 households. Amongst other indicators they test the safety of drinking water, with the household asked to provide a "glass of water you would usually drink". This is tested for faecal contamination along with the water source – often a public tap, borehole or river. Samples are processed in the field with results only available after 18 hours at best – by this time the survey team has moved on. While the data is used to monitor progress, results are not communicated back to communities.

### Behaviour change programmes

Water quality testing can play a critical role in triggering community awareness and changing defecation or water handling behaviours, especially when it provides a visual indication of contaminated water. However, the ability to demonstrate results immediately, or within a maximum of six hours, is critical to support adoption of improved behaviours. A test that can deliver same-day results will significantly reinforce the messages provided in behaviour change sessions.

### Regulatory oversight and surveillance

In many countries, regulatory and surveillance agencies, including utility providers, face major hurdles testing drinking water in rural areas. Collecting and transporting water samples to laboratories is not always possible. An improved rapid test would allow for onsite testing in remote areas to complement standard laboratory testing methods.

## Innovation project goal

### Rapid identification of faecal contamination in drinking water:

- Result available immediately or within less than six hours
- Easy to use with minimal training required, allowing communities to manage the safety of their own water
- Costs between US \$1-6 per test
- Easy to transport and able to be used in challenging settings without access to a lab, cold chain or electricity.

Detailed requirements are outlined in the full [Target Product Profile](#).

## Safely managed drinking water



Lucy is a bright student. She usually finishes in the top three of her class and wants to be a doctor when she's older. But attending school has not always been easy: "I used to drink water from the shallow wells. I had diarrhoea so many times. I would stay at home for weeks until I got better."

Through UNICEF programming Lucy has been able to access clean drinking water. "It feels so good not to be ill," she says. "I'm doing much better in school."

By working with industry to find ways to rapidly test drinking water for contamination UNICEF can ensure more children like Lucy can access clean water.

For more information: [www.unicef.org/innovation/productinnovation](http://www.unicef.org/innovation/productinnovation)

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