



# SMART DIAGNOSTICS FOR LOW RESOURCE SETTINGS

Target product profiles for devices to diagnose urinary schistosomiasis in Nigeria



## Urinary schistosomiasis



**Urinary schistosomiasis** is a parasitic disease. People get infected in lakes, rivers or streams

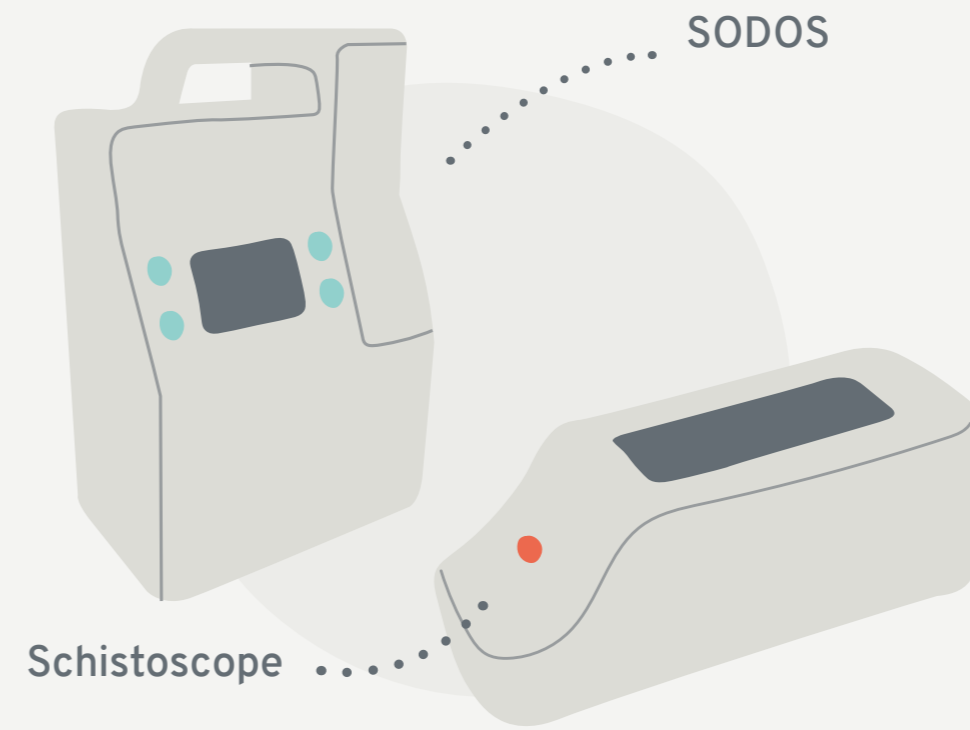


The disease can be diagnosed by **counting the worms' eggs in urine** with a microscope.



However, this method requires a **trained operator** and is prone to **human error**.

## Smart diagnostic technology



Manual microscopy can be replaced by a device that uses a simple optical system and algorithms to **automatically detect Schistosoma eggs** in a urine sample. This can offer the following benefits:

- Affordable
- Robust and portable
- Sensitive
- Rapid
- Simple and user-friendly
- Data collection

## Diagnostic challenges in Nigeria



There are **no resources** available for diagnosis at primary health care level



There are very **few cases confirmed** in laboratories



Low awareness level amongst community members results in **limited care seeking behaviour**



**Few surveys** in the community, so the disease prevalence is unknown



Only children are included in **mass drug administration**

## Promising use cases for smart diagnostics in low resource settings



### Mapping of adult populations at risk

Field deployable, affordable diagnostic test, so adult populations at risk can be mapped and treated immediately

#### Test requirements

- Easy to operate for a lab assistant
- Device is cheaper than a microscope
- Quantitative and qualitative data is shared with government
- Should comply with WHO guidelines
- Same day result
- Throughput of >50 samples per day
- Should tolerate transport stress
- At least as sensitive and specific as a microscope
- Off grid power supply
- Integrated GPS



### Diagnosing at primary healthcare level

Affordable and easy to use diagnostics enable diagnosis at primary healthcare level and sharing of data; referral to laboratories is no longer required

#### Test requirements

- Easy to operate for a community health worker
- Test should be affordable for community member
- Confirmed cases should be reported to local government
- Throughput of 1 sample per day
- Should comply with disease reporting guidelines
- At least as sensitive and specific as a microscope
- Should provide treatment dose that has to be administered
- Off grid power supply
- Share data via USB or mobile network



### Test to sensitize the community

Use diagnosis as a tool for health education, to create awareness in the community about the disease

#### Test requirements

- Easy to operate for a community resource person with very limited test experience
- Visual result, understandable for illiterate community members
- Test does not make official diagnosis, so positive cases should be referred
- Result before the end of sensitization meeting
- Should tolerate transport stress
- Off grid power supply
- Integrated GPS