GLOBAL TASK FORCE ON
CHOLERA CONTROL

Laboratories, gaps and needs for Cholera testing; WHO AFRO Regional overview

5th May 2023

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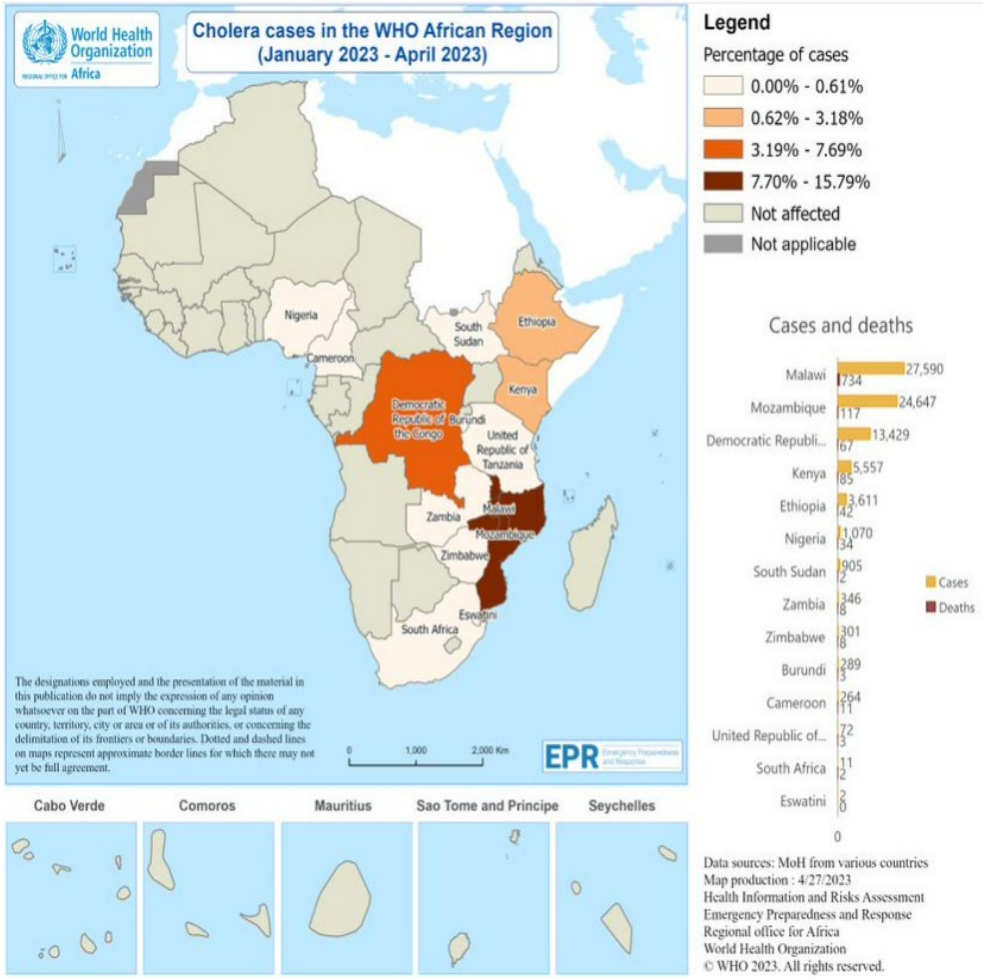
EPR Emergency Preparedness and Response

WHO Regional Office for Africa

Rapid Laboratory Capacity assessment

- **Rapid assessment of capacities, resources and opportunities:**
  - **Category 1;** Botswana, Malawi, Mozambique, South Sudan and Zimbabwe
  - **Category 2;** Algeria, Benin, Burkina Faso, Burundi, Carbo Verde, Cameroon, Chad, DRC, Guinea Equatorial, Ghana, Mauritania, Niger, Nigeria, Sierra Leone, Togo, Republic of Congo, Zambia, eSwatini



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Category 1

		Botswana	Malawi	Mozambique	South Sudan	Zimbabwe
1	What is the current testing strategy	Any suspicious stool sample showing characteristic rice water appearance	Where there is ongoing transmission, watery stool sample, test 3 samples per week from Cholera Treating centers by RDTs and culture any 3 positives, when no community transmission is happening, testing all watery stool samples on cholera RDTs and 3 positives per week for culture	Cholera Laboratory Screening and Confirmation Algorithm and Laboratory Algorithm for Laboratory Monitoring of Cholera	currently, AgRDT, culture and PCR is being used. National SOP is being developed	All suspected cases to be screened by RDT and confirmed by culture and serology
2	Public Health Reference Laboratory	National Public Health Lab	National Microbiology Reference Lab (NMRL)	National Reference Laboratory for Microbiology, INS	NPHL	National Microbiology Reference Laboratory
3	No. of labs are currently performing culture, oxidase & sero-agglutination testing and reporting on suspected samples	51 can do Culture and oxidase, sero-agglutination done centrally at 2 labs	1 lab currently does culture and sero-agglutination at NMRL. However, more 16 regional and district labs across the country can do Culture and oxidase, when resources are available	5	1	123
4	No. of labs are currently performing culture, oxidase, sero-agglutination & (AST) & reporting on suspected samples?	51	1	5	1	57
5	Is there at least 1 lab capable of performing culture, oxidase & sero-agglutination testing in each Region/District?	Yes, north and southern regions	Yes, in at least all regions, some districts can refer samples to neighboring districts with capacity	Yes	Yes	No
6	Any plans to capacitate more labs for culture/oxidase/sero-agglutination testing?	Yes	Yes, with resource availability	Yes	Yes	Yes
	If Yes, how many?	number: 5	number: 16	number: 3	number:	number: 60

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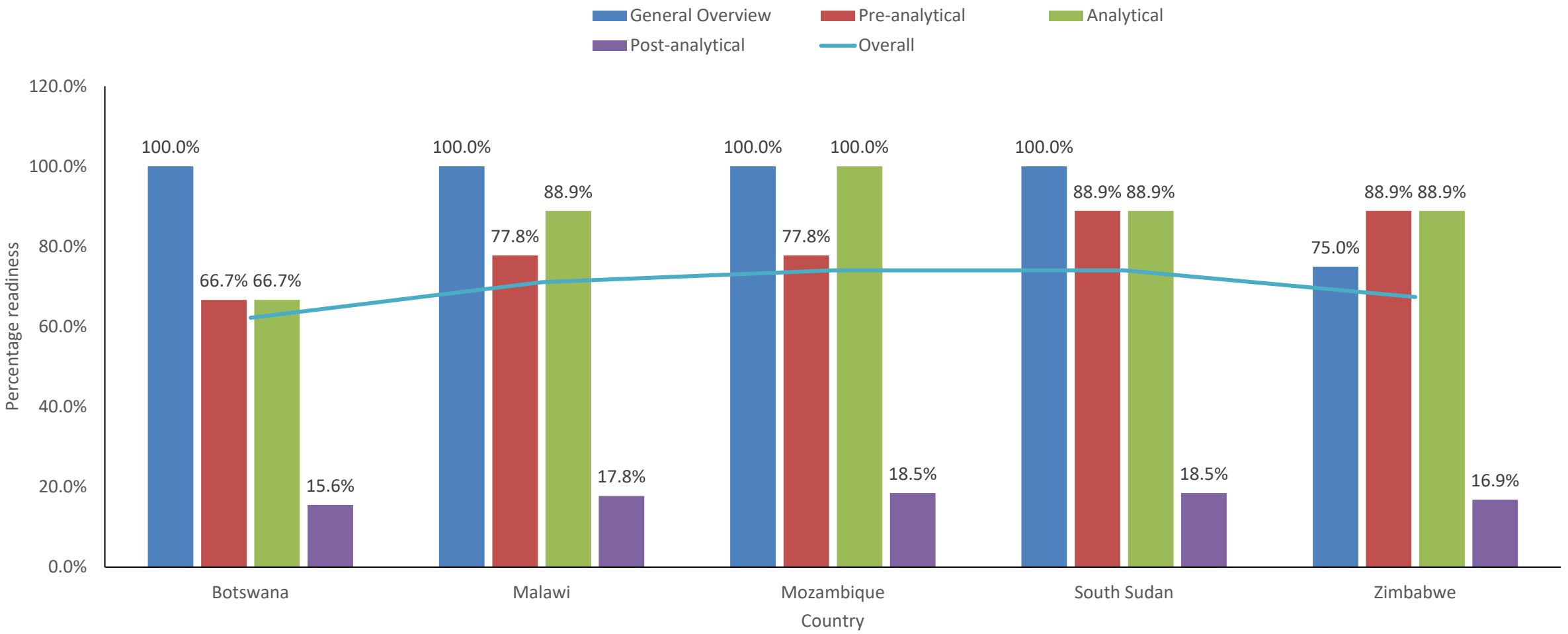
Rapid Laboratory Capacity assessment



World Health Organization

HEALTH EMERGENCIES programme

Needs

Specific Areas of Training Required	Immediate Needs in Terms of Supplies	Lists with Justification of Request
Sample handling and processing of stool samples suspected for Cholera and other stool pathogens	Stool conatiners, transport media, Culture media (TCBS), *Vibrio cholera* antisera for O1 and O139 and types Inaba and Ogawa	• Build capacity for quality sample collection and handling • To isolate and identify causative agents of diarrhea • To differentiate between O1 and O139 strains of *V. cholera* • To determine the serotype of the Vibrio cholera
Stool sample collection, transportation, and handling and processing of stool samples suspected for Cholera and other stool pathogens	Cholera RDTs, Pasteur pipettes, media (Culture media-TCBS, transport media-Cary-Blair), peptone water, oxidase reagent, *Vibrio cholera* antisera for O1/O139, CT-SMAC	• To quickly diagnose and treat cholera • To ensure safe collection and transportation of specimens • To detect *Vibrio cholera* and other stool pathogens • Build capacity of testers
Culture and Sensitivity Training	Petri dishes, sample supplies, culture media, Antibiotics discs and other supplies	• To confirm *V.cholerae* and perform AST
Molecular testing (PCR, sequencing)	RDT kits, Culture media, Serological Antisera, PCR equipment, PCR primers, probes and other ancillary supplies	• To diagnose and monitor infectious diseases • To identify antibiotic-resistant strains • Detect pathogens that when culture resources are lacking

Category 2

Opportunities	Gaps
• Technical capacity for case detection and confirmation • Job aids/ SOPs for sample collection, packaging and transport • Training on cholera sample handling and RDTs testing • Some transport media prepositioned in hotspots_Cary-Blair • Capacity for both culture techniques and drug susceptibility testing (classic antibiogram) • Some countries have decentralised labs capable of C/S • Some prepositioned RDTs (Cameroon, and partially Zambia) • Microbiology laboratories validated for case confirmation • Conventional methods of enrichment • Immunological tests with antisera • Trained staff on safety and IPC procedures present on the field for sample collection, packaging, labelling, transfer and transportation • A functional system for reporting (laboratory results) • Molecular capabilities: rtPCR, qPCR, SANGER sequencing and whole genome sequencing: Illumina MiSeq	• Weak sample referral mechanisms especially from remote areas • Frequent stock out of transport and culture media/ reagents (sera, anitibiogram,etc) • RDT shortages to support testing strategies • Long lead time for reagent/ supply delivery • Limited EQA samples to this activity internally in the country • Lack of culture reagents (CT-SMAC) for stool culture to rule out other differential causes of diarrhoel diseases; • Lack of technical capacity and reagents for genomic surveillance • Training gaps in sample collection, handling, shipment/ transportation and testing • Old SOPs; RDTs not integrated • Oxidase missing as well as the complete kits for antisera testing. • Lack of medium for storage of identified strains (further studies EQA) • Limited EQA samples to this activity internally in the country. • Certificates of IATA certified shippers often not renewed. • PCR kits for strain identification are not available. As well as genomic sequencing inputs

Some field experience challenges with RDTs

- **Current RDTs, Arkray Dipstick:**

Some internal challenges:

- ❖ No mark on the disposable plastic droppers for amount of stool to be added to the tube where the strip will be placed
- ❖ or how much such liquid should be added to the tube with buffer is already added.
  - ✓ Too much of liquid stool leads to failed test
  - ✓ Too little littles liquid stool could give false negative results
  - ✓ The triple package only can only hold up to only 3 Cary-Blair inoculated tubes; 5 tubes, the triple package will not close.
- ❖ Shelf life short

Long tubes, >5 tubes can't fit in small size triple packaging

Next steps

- Ensure understanding of the strategy (GTCC), ensure guidance is provided on differential tests
- Support countries to revise their testing strategies
- Training gaps in sample collection, handling, shipment/ transportation and testing
- Disseminate job aids and ensure understanding
- Strengthen sub-national culture capacities for hard to reach areas
- Adopt efficient sample transport network (Hub-Spoke model and use of contractors)
- Improve supply chain issues, stock pile for reactive supply distribution
- Mobilize resources for RDTs, culture, PCR and sequencing
- Leverage existing virological molecular capacity/ experiences for PCR capacity building
- Improve RDT/ culture data collection analysis and sharing
- Other supplies for differential diagnosis of other enteric pathogens
- Encourage local supplies development capacities