

# RDT Based Cholera Surveillance

Sagar Dahal  
Ministry of Health and Population  
Nepal

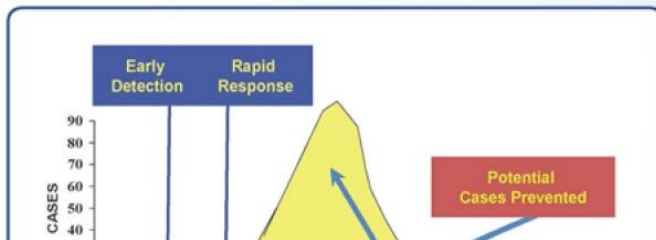
# Prevalence of Cholera in Nepal

- Nepal is an endemic country 31 million
- Incidence rate of cholera is 1.64 per 1000 (global burden of cholera in endemic nations)
- 60% of the Nepalese population at risk of contracting the disease i.e. over 18 million people. (Rhee, et al., March 2020.)
- Recent PAMI mapping have identified 19 districts (32.6%) with high priority index and 16 (43.9%) districts with high vulnerability score



# Existing national guiding documents for Cholera/ AGE

## EARLY WARNING AND REPORTING SYSTEM (EWARS)



राष्ट्रिय खानेपानी गुणस्तर सन्धिलेन्स  
निर्देशिका २०७०  
(प्रथम संशोधन २०७५)

हैजा (Cholera) महामारी नियन्त्रण र रोकथामको लागि  
खोप कार्यक्रम संचालन निर्देशिका २०७८/७९

Cholera Outbreak Response Immunization Strategic Guideline



आपत्कालीन चिकित्सकीय समूह परिचालन  
सम्बन्धी निर्देशिका, २०७९



नेपाल सरकार  
स्वास्थ्य तथा जनसंख्या मन्त्रालय  
स्वास्थ्य सेवा विभाग  
इपिडेमियोलोजी तथा रोग नियन्त्रण महाशाखा



नेपाल सरकार  
स्वास्थ्य तथा जनसंख्या मन्त्रालय  
काठमाडौं, नेपाल

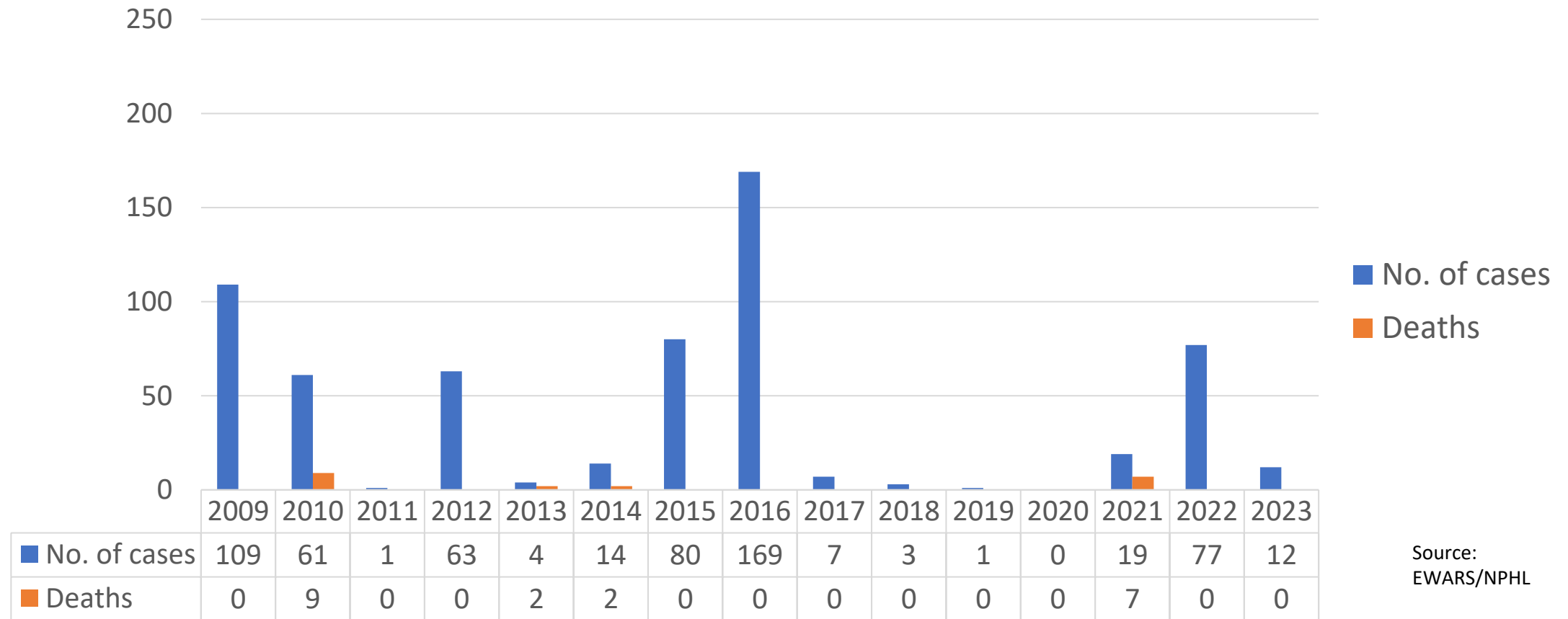
## NATIONAL PREPAREDNESS AND RESPONSE PLAN FOR ACUTE GASTROENTERITIS/ CHOLERA OUTBREAKS IN NEPAL

July 2017 to July 2022 AD



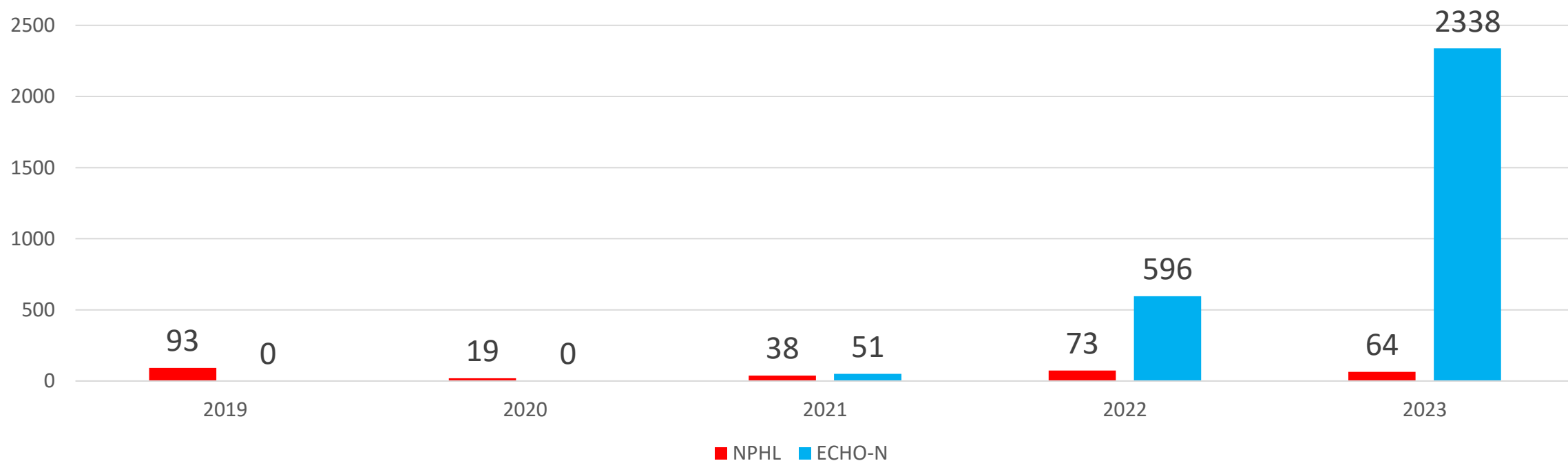
GOVERNMENT OF NEPAL  
MINISTRY OF HEALTH  
DEPARTMENT OF HEALTH SERVICES  
EPIDEMIOLOGY AND DISEASE CONTROL DIVISION

# Reported Cholera Cases in Nepal 2009 to 2023



Source:  
EWARS/NPHL

# Samples received and Tested for cholera

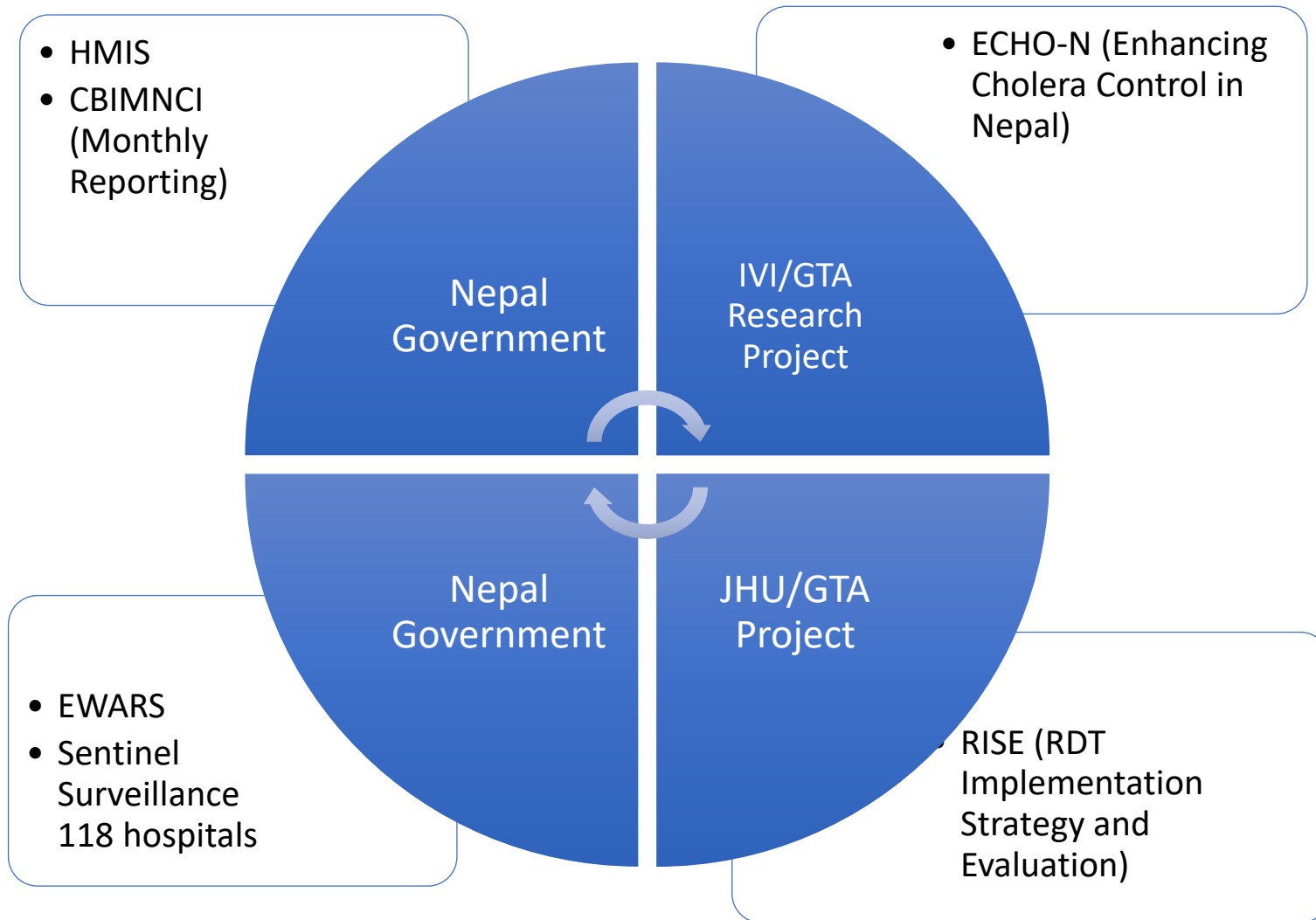


- CULTURE FACILITIES ACROSS NEPAL 24 ONLY INCLUDING 4 PPHL
- 2 +VE in 2019 and 2021
- 45 +VE in 2022

# Cholera Outbreak- Last 10 Years

District	Year of Outbreak
Dolakha	2022
Saptari	2017
Rautahat	2014
Kathmandu	2013, 2014, 2015, 2016, 2022
Kapilbastu	2021
Lalitpur	2022
Bhaktapur	2022
Dadheldhura	2019

# Cholera Surveillance Platforms in Nepal



# Cholera Case Definition

(standard of practice in the **absence** of RDTs)

## EWARS

- **Suspected:** AWD with or without vomiting in a patient aged 3 years or more
- **Probable:** Not applicable
- **Confirmed:** Culture/PCR  
Confirmed

## Standard Treatment Protocol for Basic Health Services

- A patient over **three years** who rapidly develops moderate or severe dehydration from watery diarrhea



# **Nepal has expanded the use of cholera RDT to facilitate surveillance**

- Cholera RDTs were used for surveillance, outbreak and research purpose
- From Gavi support RDT kits has been distributed to 118 EWARS sites in Nepal for hotspot mapping.
  - 2023: based on AWD
  - 2024: distribution in progress

# Cholera Case Definition (**current** RDT Surveillance Platforms)

## RISE (2023-2025)

- Age  $\geq 2$  years
- $\geq 3$  loose stools in less than 24 hours
- Duration of illness less than 7 days
- Severe Dehydration

### **Without**

- Blood in stool
- Fever  $>39^{\circ}\text{C}$

## ECHO-N (2020-2025)

- Age  $\geq 2$  years
- $\geq 3$  loose stools in less than 24 hours
- Duration of illness  $\leq 4$  days
- with or without dehydration

All RDT-positive samples and 10% of RDT –ve samples were cultured at the NPHL for Confirmation

# GTFCC Recommended Case Definition

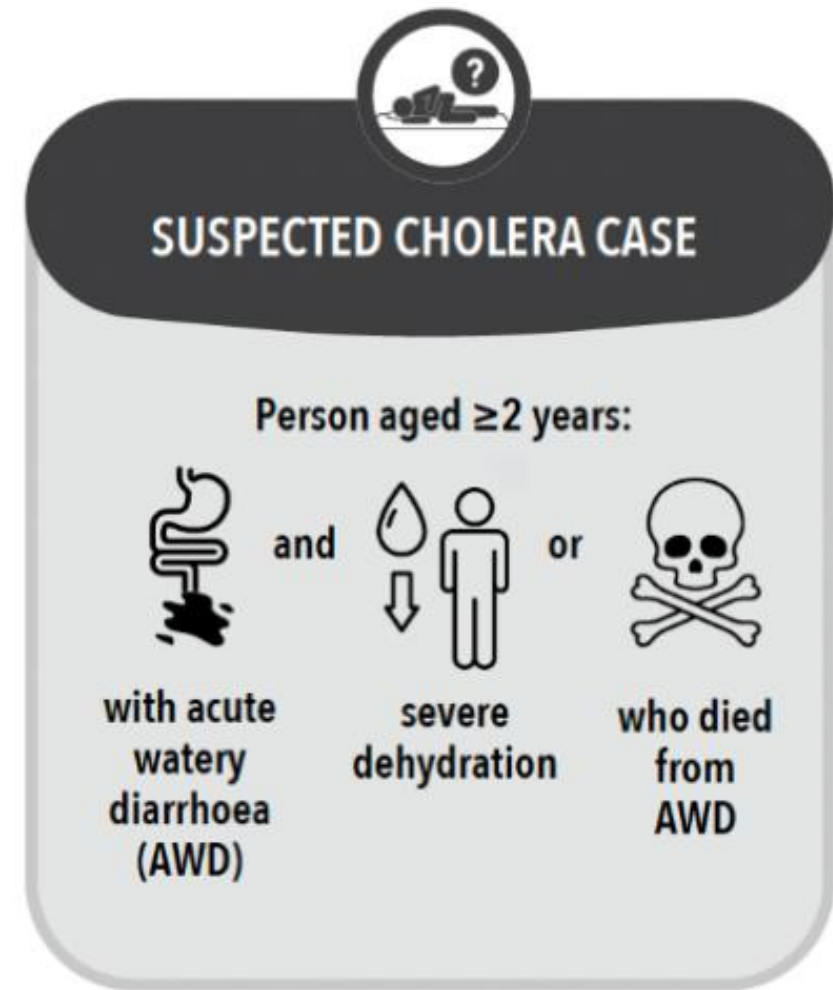
In the **absence** of a probable or confirmed cholera outbreak:

## **Suspected cholera case**

- Aged  $\geq 2$  years
- Acute watery diarrhea
- Severe dehydration

## **OR**

- dying from AWD with no other specific cause attributed to this death.



# RDT Kits Available for Cholera Surveillance in 2024

- Previously used RDT only detected *Vibrio cholerae* **O1**
- Crystal VC-Immunochromatographic One-Step Rapid Visual Test for *Vibrio cholerae* dipstick – test for **both O1 and O139**
  - **Issues: how to interpret O139 band?**

## Supply quantity of Cholera RDTs by Gavi – 43660

- Manufactured date: 2024-02-27
- Expiry date: 2025-08-27

# Reflections from **current** RDT based Cholera Surveillance Research/Pilots

- All the AGE/AWD cases cannot be tested considering the availability of RDT and not recommended by GTFCC
- Cases with no and some dehydration were found to be positive in culture/RDT
- As per CBIMNCI data, nearly 30% of AGE cases show at least one form of dehydration

# Reflections from **current** RDT based Cholera Surveillance Research/Pilots:

- The existing reporting /surveillance platforms does not provide data on levels of dehydration for AWD cases reported  
→ Therefore, difficult to determine # RDTs needed for the selected sites

# Rationale for National adaptation



Evidence from the EWARS, HMIS, RISE, and ECHO-N surveillance showed that diarrheal patients with severe dehydration is very low, and patients with some dehydration were also confirmed as cholera patients



Reduces the chances of missing cholera cases



Early outbreak monitoring and improved cholera burden estimates



Endemic country with open border

# Adopted Case definition for **future, national-level RDT** Based Cholera Surveillance

## **Suspected Cholera Case:**

1. Age  $\geq 2$  years
  2.  $\geq 3$  loose stools in &  $<24$  hours
  3. Duration of illness less than 7 days and exclusion of blood in stool and **some**/severe dehydration
- OR who died from acute watery diarrhea with no other known cause of death.

## **Probable Cholera:**

A suspected cholera case with a positive rapid diagnostic test (RDT+).

## **Confirmed Cholera:**

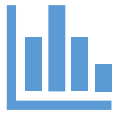
Any person infected with *Vibrio cholerae* O1 or O139, as confirmed by culture (including sero-agglutination) or PCR.



# Proposed Plan for RDT deployment

- RDTs based surveillance primarily from all EWARS sites
- Stockpiles will be made at the PPHLs so non-EWARS sites can have access to them if they have a suspect case or incase of outbreak through RRT/PHD
- Further customization of the EWARS system to collect the necessary data
  - Enable reporting of two tests (RDT and confirmatory test, i.e. culture/PCR)
- PPHL will be responsible for submitting an EWARS record on behalf of the non-EWARS facility once RDT result is obtained.

# Preparation for RDT Deployment



Data gathering and analysis



Drafting and finalizing Standard Operating Procedure (SOP)



Drafting and finalizing testing algorithm



Translation of IEC materials into Nepali (GTFCC job aid, RDT interpretation guide, Audio – video material)



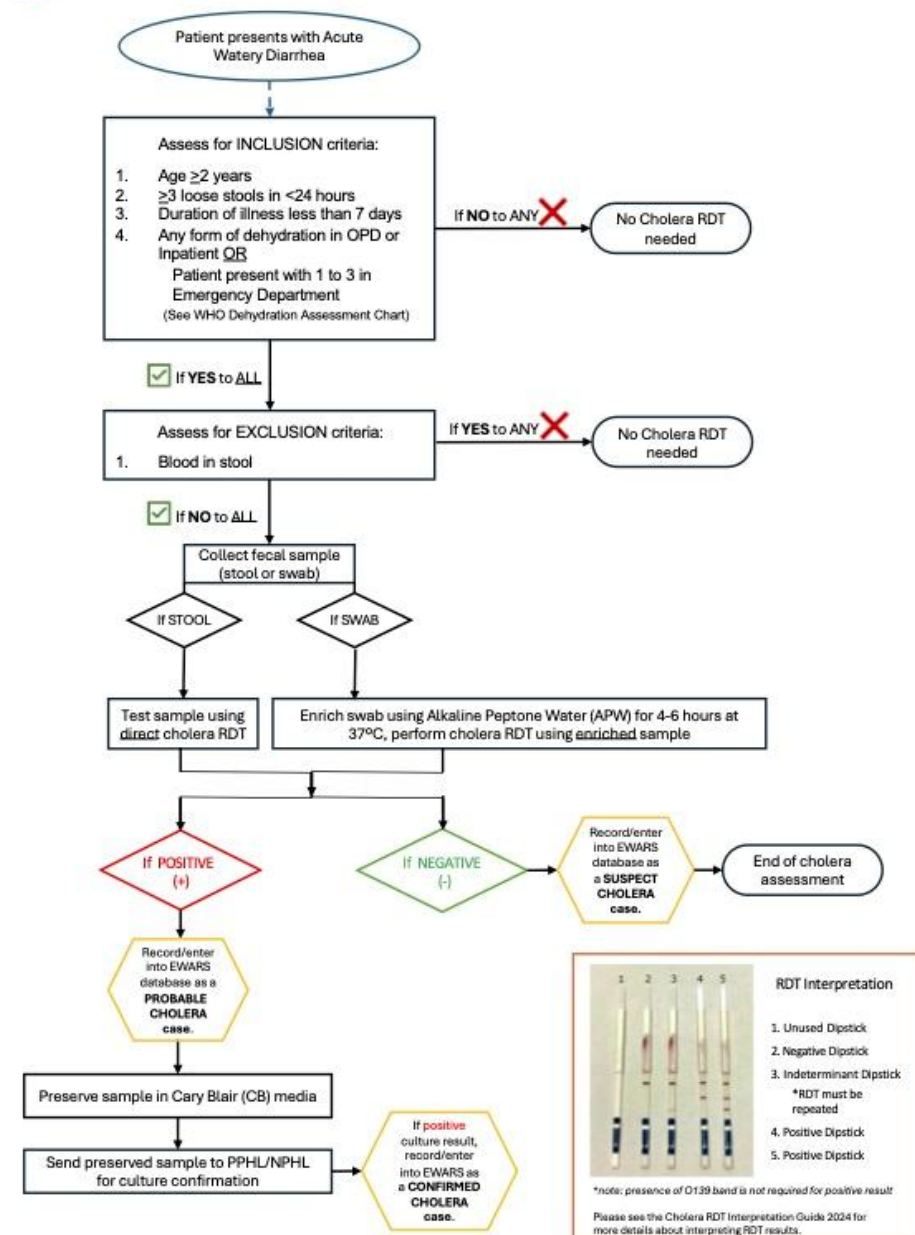
Conducted the workshop/meetings for building consensus and feedback



Training and Orientation

# RDT Testing Algorithm

- RDT should be used for persons aged  $\geq 2$  years with Acute Watery Diarrhea (AWD) and at least some dehydration.
- At the ER department, RDT is to be used for all AWD cases
- At OPD, RDT to be used for AWD cases with at least some dehydration
- If positive, the corresponding stool sample (preserved in Cary Blair media) transported to PPHL or NPHL for culture confirmation.
- Active engagement of PPHL/NPHL for sample transportation and further testing arrangement)



# Issues with RDT based cholera surveillance

## Training

- Budget constraints
- Challenging to provide training to all EWARS sites once

## Reporting

- Under reporting with missing information
  - HMIS is nationwide but do not report the laboratory data
  - EWARS system expanding, currently at 118 sites and an additional 26 reporting sites
- No timely training and orientation on reporting system to all sites

# Issues Cont..

## Confirmation

- Only 24 Health facilities with culture facility in 4 province out of 7 province
- Round the year availability of the specific media and reagent required for the cholera culture and confirmation across all testing facilities
- For the serological/PCR confirmation of the strain – dependent on National Public Health Laboratory (NPHL)

## Sample transportation

- Unavailability of the proper transportation media in many facilities
- No timely and proper transportation of the cholera specimen along with the patient's details

# Recent Initiatives

- Identification of Priority areas for Multisectoral Interventions (PAMI) for Cholera Control
- &
- Development/Update of Cholera Control Plan
  - with the Support from GTFCC

# Acknowledgements

- **GAVI**
- **IVI**
- **JHU**
- **GTA**
- **WHO**
- **BMGF**

**THANK YOU!! 😊**