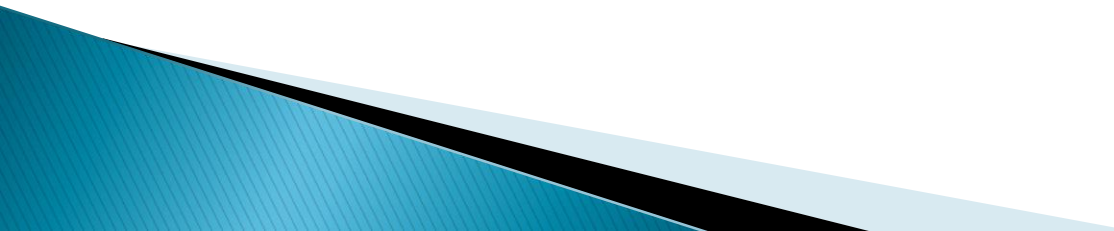


# Foodborne illness surveillance in Bangladesh: Laboratory component

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# Guiding principles

- ▶ In line with national FSER Plan and other plans
  - ▶ Based on the concept of the 3 general surveillance methods:
    - Pathogen-specific
    - Notification/complaint system
    - Syndromic
  - ▶ Avoid duplication to ensure efficient resource allocation
  - ▶ Quality assurance
  - ▶ Building capacity
  - ▶ Possible within the existing system
  - ▶ Realistic within physical/financial/logistic facilities
  - ▶ Fosters partnership and collaboration
  - ▶ Sustainable
- 

# Objectives

- ▶ To systematically collect, analyze and disseminate information about well-defined syndromes and lab-confirmed illnesses for prevention of enteric diseases

# Sentinel sites

## District Hospitals

- ▶ Habiganj
- ▶ Narshingdi
- ▶ Cox's Bazar
- ▶ Naogoan
- ▶ Patuakhali
- ▶ Thakurgaon
- ▶ Satkihra

## Medical College Hospitals

- ▶ DMCH
- ▶ Uttara Adhunic

## Institute

- ▶ BITID



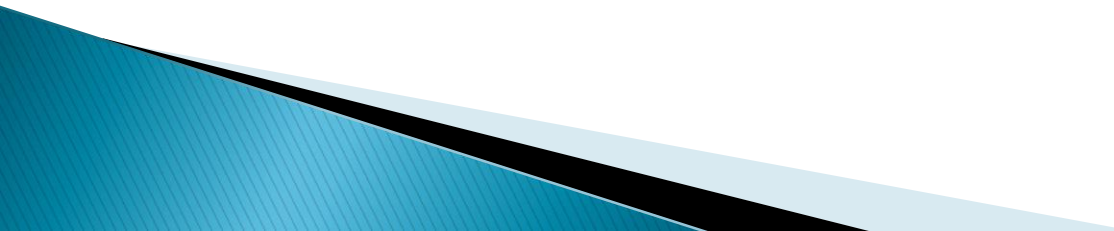


# Disease/syndromes

- ▶ Acute watery diarrhoea
- ▶ Acute hepatitis
- ▶ Febrile illness

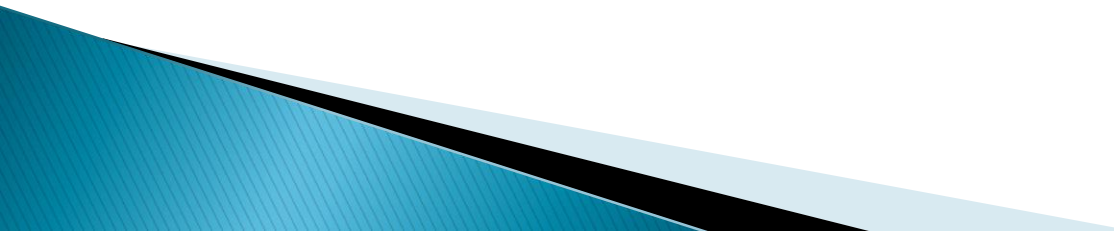
# AWD

## Site: IPD/ORT

- ▶ **Acute watery Diarrhoea (age > 2 months):**  
Three or more loose or watery stools in 24 hours
  - ▶ **Diarrhoea in a young infant (age < 2 months):**  
A young infant has diarrhoea if the stools have changed from usual pattern and are many and watery (more water than faecal matter)
- 

# Acute hepatitis

## Site: OPD

- ▶ **Suspected case:** Acute hepatitis is defined as acute illness (less than 6 months) with
    - Discrete onset of symptoms (e.g., nausea, anorexia, fever, malaise, or abdominal pain)
- AND
- Jaundice (yellow colouration of the eyes or sclera)
- OR
- Elevated serum amino-transferase levels/serum bilirubin
- 


# Febrile illness

## Site: IPD/OPD

- ▶ Eligible patients attending the hospital due to sustained fever
  - Temperature on admission of 38.5°C or greater with no identified cause of fever, such as pneumonia or focal infection
- ▶ Irrespective of age for >3 consecutive days




# Activities at surveillance sites

- ▶ Deployment of surveillance teams
  - ▶ Surveillance physicians to identify cases, collect clinical and potential exposures
  - ▶ Nursing staff– assist in maintaining registrar, data reporting and sample collection
  - ▶ Medical technologists – collect biological samples (stool/rectal swab and blood)
  - ▶ Occasionally – vomitus/food samples
  - ▶ Supporting staff – provide support to teams and assist in sample transportation
- 

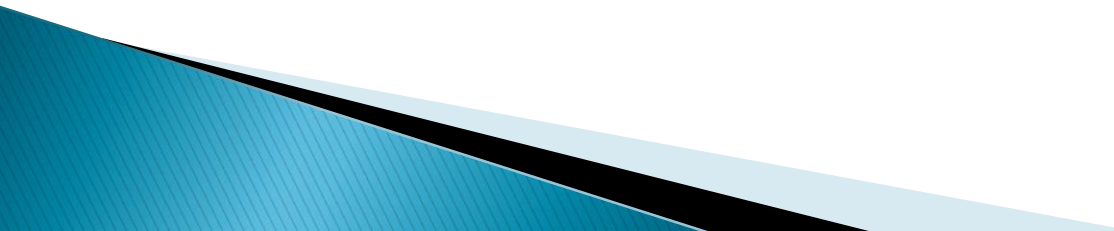
# Focus of Questionnaire

- ▶ Demographic

- ▶ Clinical

- Date of onset
    - Duration
    - Severity of symptoms
    - Visits to health care providers or hospitals
    - Laboratory results
    - Antibiotic use
  - A complete food history
  - Water exposure
  - Potential exposures
    - Ill persons
    - Exposure to a farm or farm animals
    - Travel history
- 

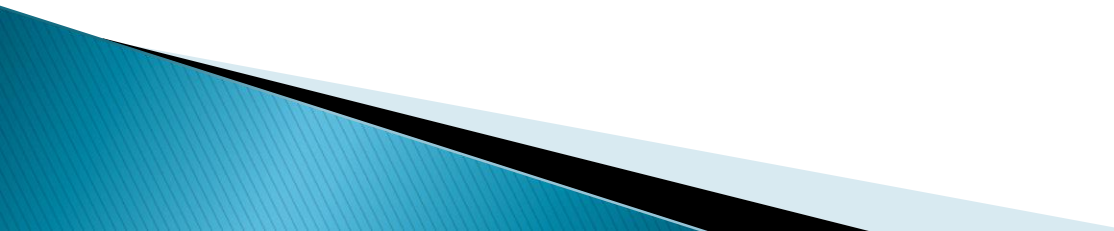
# Pathogens

- ▶ *V. cholerae* – culture, serotyping, sensitivity
  - ▶ Rotavirus– ELISA
  - ▶ *E. coli* (ETEC, EPEC, EAaggEC)– multiplex PCR
  - ▶ *Salmonella* – culture, serotyping, sensitivity, TP Test
  - ▶ *Shigella* –culture, serotyping, sensitivity
  - ▶ Hepatitis A/E– ELISA
  - ▶ *Clostridium difficile*– culture, ELISA, PCR
  - ▶ *Leptospira spp.*– ELISA/PCR
- 


# Tests

- ▶ Stool specimens: Culture, serotyping, sensitivity for *V. cholerae*, *Salmonella*, *Shigella* and *E. Coli*
- ▶ Blood for *Salmonella* Typhi/Paratyphi
- ▶ 8 ml from adults and 5 ml from children <5 years – heparinised tubes for TPT
- ▶ Serum for hepatitis E/A and Leptospira
- ▶ Sensitivity to antibiotics on every fifth age stratified (<5 years and 5 years and above) bacteriological isolates for *V.cholerae* O1, *Shigella* spp. *E. coli* and all isolates for *S. Typhi*/Paratyphi from each site

# Samples requirement

- ▶ 2 Stool swabs or rectal swab (RS) per patient in Cary Blair
  - ▶ Stool in eppendroff and transported fresh – *Rotavirus/clostridium difficile*
  - ▶ Blood samples
- 

# Analysis plan

- To estimate the frequency of hospitalizations due to specific enteric pathogens in selected hospitals in Bangladesh
  - To estimate the proportion of these hospitalizations due to specific foodborne aetiology in selected hospitals in Bangladesh
  - To determine the antimicrobial sensitivity pattern of major bacterial organisms in those hospitals surveillance sites
  - To describe the clinical characteristics of patients hospitalized with different enteric diseases at the hospital surveillance sites
  - To determine the age, sex, regional and seasonal distribution of hospitalizations
- 



# Sample size for stool per site

- ▶ Stool swabs (10 patients per site per week X 52 weeks X 2 years) = 1040
- ▶ Stool in eppendroff tubes = 1040

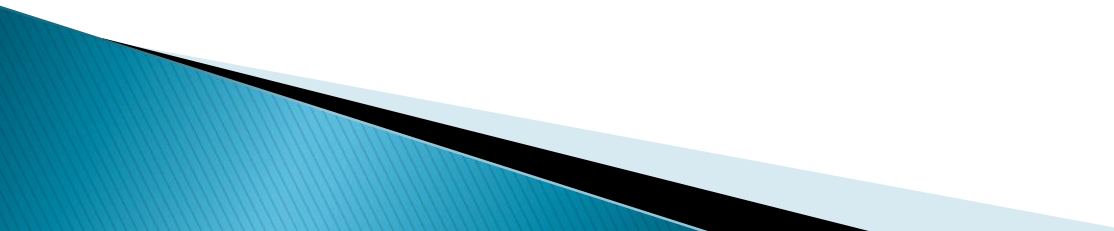
# For Rotavirus (0–5 years)

- ▶ In half filled eppendroff tubes
- ▶ Tested using ELISA

# Blood for culture

- ▶ From 5 patients per week per site X 52 weeks  
X 2 years = 520 samples

# Serum for acute hepatitis

- ▶ From 5 patients per week per site X 52 weeks X 2 years = 520 samples
  - ▶ Samples to be centrifuged at the sites
  - ▶ Transferred in 2–8 °C in cool boxes
  - ▶ Frequency of shipment ?
- 

# Surveillance steps prior to lab-confirmation



[http://www.cdc.gov/foodnet/surveillance\\_pages/burden\\_pyramid.htm](http://www.cdc.gov/foodnet/surveillance_pages/burden_pyramid.htm)

# Strengths and limitations

- ▶ Highly sensitive
- ▶ Helpful in detecting clusters with common agent
- ▶ Trend of severe illness
- ▶ Inclusion of only diseases detected by routine testing
- ▶ Only reported to the public health agency
- ▶ Delay in cluster detection
- ▶ Delayed response

Strengths

Limitations



Questions?