# Existing interventions on cholera Prevention and control

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**IDEA**

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**Following aspects of cholera interventions will be presented:**

Patient Care

WASH

Surveillance and obtaining nationwide data for cholera

Plans for interventions for control of cholera

# PATIENT CARE

# Diagnosis of Cholera

- Clinical history with profuse watery diarrhoea along with nausea, vomiting and abdominal cramps.
- Stool characteristics
- Dark Field Microscopy

  and microbiological culture (gold standard)
- Rapid immunochromatographic dipstick tests (RDT)
- Additional methods of detection include PCR

**Stool from Cholera Patients**

# Classification of dehydration:

**If the patient has the following signs:**

Well, Alert,
Normal eyes
Not thirsty, drinks normally, Skin pinch goes back quickly

No sign of dehydration

**If the patient has two or more of the following signs:**

Restless, irritable,
Sunken eyes
Thirsty, drinks eagerly,
Skin pinch goes back slowly

Some dehydration

**If the patient has two or more of the following signs:**

Lethargic or unconscious,
Deeply sunken eyes
Drinks poorly, or not able to drink
Skin pinch goes back very slowly

Severe dehydration

**First large-scale hospital-based study on the effectiveness of ORS**

*(Cash R, Amer J Trop Med Hyg. 1970)*

**First demonstration of feasibility of home-based administration of ORS**

*(Chen L, Amer J Trop Med Hyg. 1980)*

# Treatment of Cholera

In mild to moderate cases, ORS is used for both rehydration and for maintenance of hydration along with normal food and water

- ORS contains sodium chloride, potassium chloride, Trisodium citrate dihydrate, glucose anhydrus; the solution is prepared by adding the entire contents of a sachet of ORS in ½ or 1 litre (depending on the preparation) of safe water

**Severe cases will need rehydration with intravenous fluids, preferably Ringer's Lactate / Cholera Saline**

Medical Emergency !!!

- **Intravenous fluid:** For cases of severe/moderate dehydration when oral rehydration alone is not sufficient to keep up with fluid loss

- **Antimicrobial therapy:** Shortens duration of illness, hospital stay and reduces community transmission

- **Adjunct therapy:** Zinc has been shown to decrease duration and severity of diarrhea (30 mg/day/10 days in <5years); Vitamin A to children who have not received it during NID programs

**One hour after administration of rehydration therapy**

**Condition of patients on arrival**

# Critical Management Issues

**Complications in cholera**

- Major complications of cholera include hypoglycemia, hypovolemic shock, septic shock (rare), hypothermia, hypernatremia, acidosis, hypokalemia, abdominal distention
- Serious complications-acute renal failure and circulatory failure
- Spontaneous abortion and stillbirth in pregnant women

# Surveillance for Cholera

# Gaps in Cholera surveillance in Bangladesh

- DGHS passive reporting – 21,35,220 diarrhoeal cases reported in 2015
- Ranks number one among all diseases (14.63% )
- Clinically diagnosed 23,886 cholera cases reported in 2015
- IEDCR estimates 300,000-450,000 cases including 4500 deaths/year
- No active or passive surveillance system for cholera
- One of the leading causes of under five morbidity and mortality
- No lab. Diagnostics for cholera at district and sub-district level health facilities
- Not reported to World Health Organization

Poor drainage, water supply

Unhealthy and unhygienic living conditions

Overcrowded areas, households

Sharing of water sources, toilets

# High risk Study Population

# Limited outbreak investigation reported by IEDCR

| SL | Year | Place | Duration (Days) | case | Dx | Rectal Swab | V. Cholerae (+) | *V. cholerae* (+) (%) | Deaths |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2011 | Bogra Sadar | 4 | 22 | AWD | 17 | 5 | 29 | 0 |
| 2 | 2011 | Kishorganj Sadar | 5 | 84 | S. AWD | 20 | 8 | 40 | 0 |
| 3 | 2011 | Tangail Sadar | 12 | 314 | AWD | 24 | 8 | 33.3 | 0 |
| 4 | 2011 | Kallyanpur, Dhaka | 10 | 644 | AWD | 65 | 24 | 37 | 2 |
| 5 | 2012 | Moddho Badda, Dhaka | 7 | 1500 | | | | | 0 |
| 6 | 2013 | Netrokona | 70 | 1568 | AWD | 41 | 33 | 80 | 5 |
| 7 | 2013 | Mymensingh | 7 | 64 | | | | | 0 |
| 8 | 2013 | Narayanganj, Dhaka | 7 | 645 | AWD | 6 | 3 | 50 | 2 |
| 9 | 2014 | Chuadanga Sadar | 11 | 1323 | AWD | | | 36 | 1 |
| 10 | 2014 | Kushtia, Sadar | 5 | 506 | | 19 | 4 | 21.1 | 0 |
| **Total** | | **10** | | **6670** | | | **85** | | **10** |

# Ongoing 22 Surveillance Sites for 'Endemic Cholera Control in Bangladesh Study' (ECBS)

## Objectives:

- **Develop and scale up surveillance for cholera at high risk areas**
- **Develop awareness among district and sub-district managers**
- **Establish lab-based cholera surveillance at 'hotspot' areas**
- **Outbreak Investigation for cholera**
- **Geospatial mapping for confirmed cholera cases**
- **Identify strategies for the introduction of OCV in Bangladesh**
- **Reported on the IEDCR and the MIS of GoB**

# Surveillance for cholera: Joint collaboration between icddr,b and IEDCR (GoB)

| 10 Sites under surveillance from May 2014 | |
|---|---|
| DMCH, Dhaka | Patuakhali |
| Uttara Adhunik MCH, Dhaka | Satkhira |
| BITID, Chittagong | Naogaon |
| Narsingdi | Habiganj |
| Cox's Bazar | Thakurgaon |

| 12 Sites started from May 2016 | |
|---|---|
| Sub-district | District |
| Madan, Netrokona | Narayanganj |
| Bakerganj, Barisal | Meherpur |
| Mathbaria, Pirojpur | Kushtia |
| Chaugacha, Jessore | Tangail |
| Shibganj, Chapainawabganj | Chuadanga |
| Chatok, Sunamganj | Comilla |

# WASH INTERVENTIONS

# Water, sanitation and Hygiene (WASH)

**Actions targeting environmental conditions include:**

- Ensure supply of safe drinking water
- Develop/improve of piped water systems with water treatment facilities (chlorination)
- Interventions at the household level (water filtration, chemical or solar disinfection of water, safe water storage)
- Construction of systems for safe sewage disposal, including latrines.
- Random analysis of water and appropriate measures to improve water quality- chlorination if needed
- Strengthen pathogen control activities
- Stockpile WASH supply and use in case of urgent need

# icddr,b research initiatives to combat diarrhoea

## Water treatment

- Point of use water treatment
- Chlorine tablet
- Safe storage



## Hygiene

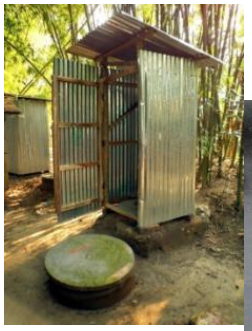
- Handwashing system
- Food hygiene
- Safe food storage





## Sanitation

- Double pit latrine
- Child potty
- Sani-scoop
- Safe feces disposal



# Government of Bangladesh and development partners and icddr,b

- 20 projects on WASH 2009-2016 at the icddr,b
- Publication,diseemination of information from research findings
- Work closely with Government and development partners
- Work carried out in urban, rural and costal areas
- Work in the hospital
- Conduct National Hygiene survey and other impact evaluation

# Hygiene promotion and social mobilization

Appropriate hygiene practices, hand-washing with soap, safe preparation and storage of food and safe disposal of the faeces of children

Development and dissemination of IEC materials- use of media

Awareness campaign during outbreaks-involving local communities

Strengthening promotion of breastfeeding

Establishing immediate reporting system during outbreaks

# Behavior Change Interventions

## OCV+WASH an arm involving 30 in the large 90 cluster feasiblity study

Hand washing

Point of use water treatment

**Protective efficacy-57% in BCC arm compared to 53% in the vaccinealone arm**

# Interventions for control of Cholera

# Licensure and availability of the locally produced OCV in Bangladesh

- Clinical Trial report submission to Bangladesh DGDA
- Registration
- Fixing Price
- Vaccine release
- Licensure expected in Bangladesh in the next 1-2 months for Cholvax
- After licensure, vaccine can be used in public health programs in Bangladesh
- Marketing by local companies

# Critical step towards introduction of OCV in public programs in high risk group in Bangladesh

**Inclusion** of OCV in the Disease Control Operation Plan of the 4th Sector Wide Approach (SWA)

WHO **Prequalification** of OCV locally manufactured in Bangladesh

Availability, affordability and feasibility for incorporation of OCV with the National Immunization System for **mass campaigns**

**Questions-advocacy efforts** directed towards introduction regarding the impact, costs, logistics, and cost-effectiveness to be expected with implementation of age- and geography-targeted use of OCV in mass immunization programs

# STRATEGIES for the FUTURE for Bangladesh

**Identify hotspots** in Bangladesh based on nationwide surveillance and outbreak investigations

GoB and NGO are **planning interventions for improvement of water and sanitation facilities** but this may not be achieved throughout Bangladesh in the next 5-10 years

**OCV introduction-** Use locally produced vaccine for control of endemic cholera as a preventive measure for the short term in phases over the next 5 years **(+ WASH interventions)**

***Phase 1***- Initiate OCV campaigns in hotspots in Dhaka City- 5 million targeted

**Phase 2**- Carry out OCV campaigns in hotspot outside Dhaka starting with the areas having highest burden-Chittagong, Cox's Bazar and moving on to the South and North

**Phase 3**- Vaccinate every 3 years and move to other sites/hotspots

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