

**CBDM India 2025**

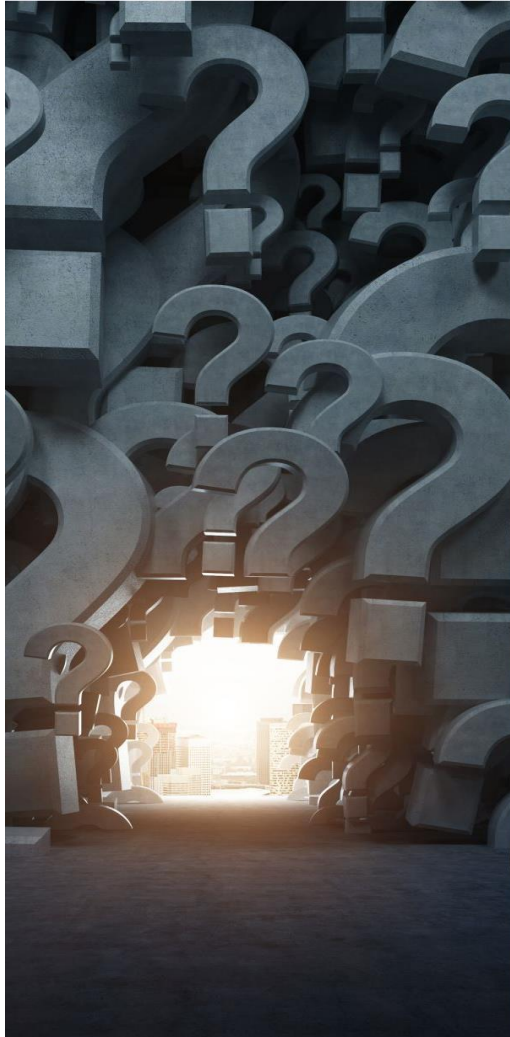


# ***Logistic Challenges of Providing Water, Sanitation & Hygiene during Disasters***



***Presented by: Dr. Mayur Kale***

***WatSan manager, Project coordinator and Career manager with MSF***



# Can you tell me Types of Disasters??

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**Natural Disasters**

**Human-Made Disasters**



# Importance of Water Hygiene & Sanitation (WASH)

## Mortality

**1.4 million**

deaths\* could have been prevented with safe WASH in 2019

## Morbidity

**74 million**

DALYs\* could have been prevented with safe WASH in 2019

## Attributable fraction

**69%**

of all diarrhoea deaths in 2019 were attributed to unsafe WASH services

## Diarrhoea deaths

**>1 million**

died from diarrhoea due to unsafe WASH in 2019

## Acute respiratory infections deaths

**356 000**

died from acute respiratory infections due to unsafe hand hygiene practices in 2019

FILTERS

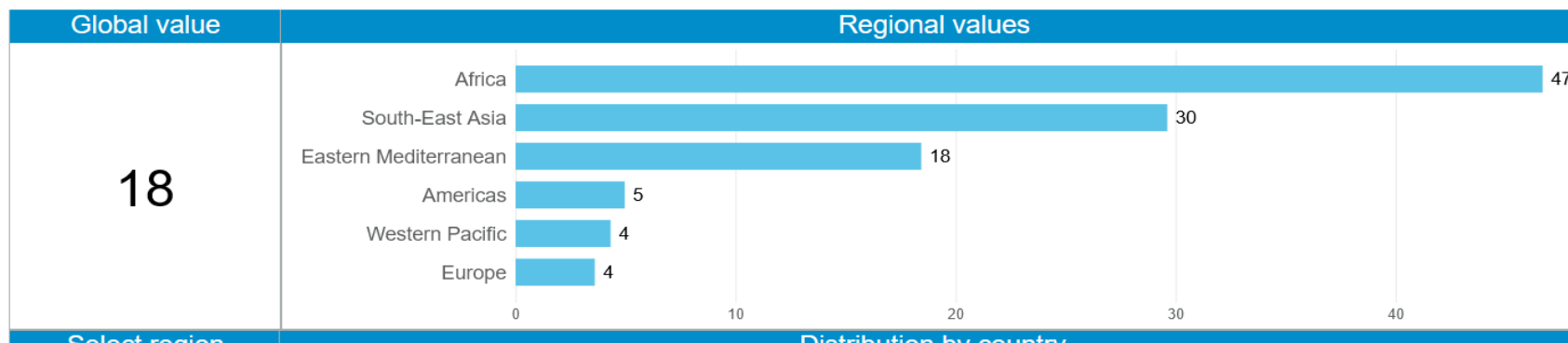
Mortality rate attributed to exposure to unsafe WASH services (per 100 000 population) (SDG 3.9.2)

Year

Latest

Disaggregation

Sex



<https://www.who.int/data/gho/data/themes/topics/water-sanitation-and-hygiene-burden-of-disease>





**740,746**

ROHINGYA ARRIVED IN COX'S BAZAR,  
AUG 17 - JAN 19\*

**909,235**

TOTAL NUMBER OF ROHINGYA LIVING  
IN COX'S BAZAR AS AT END JAN 19\*

**1,050,000**

CONSULTATIONS PROVIDED BY MSF,  
AUG 17 - DEC 18





# Impact of Lack of WASH is exacerbated in emergencies or refugee/displaced crisis



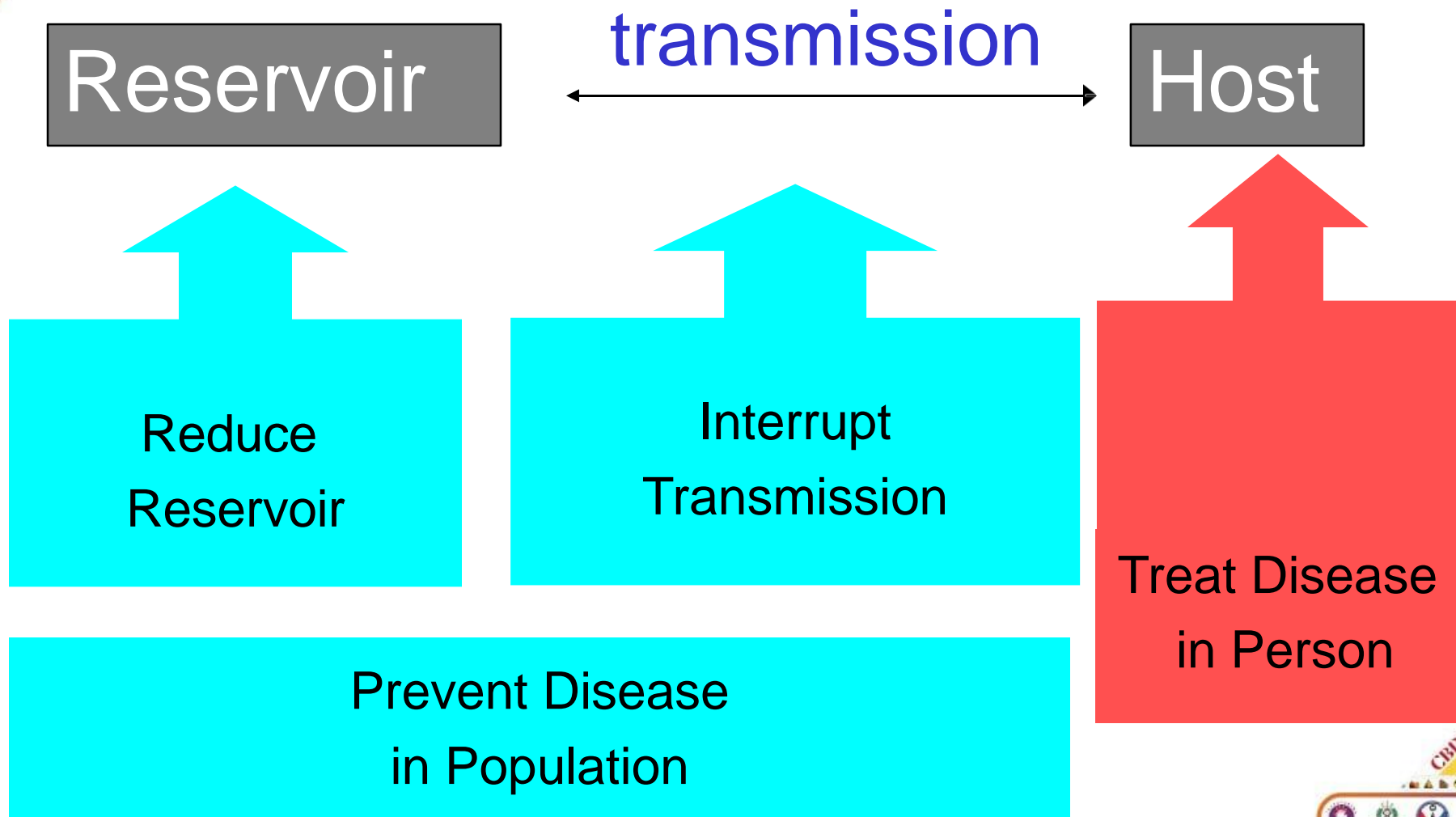
(Bangladesh 2017-18)



# Importance of Water Hygiene & Sanitation (WASH)

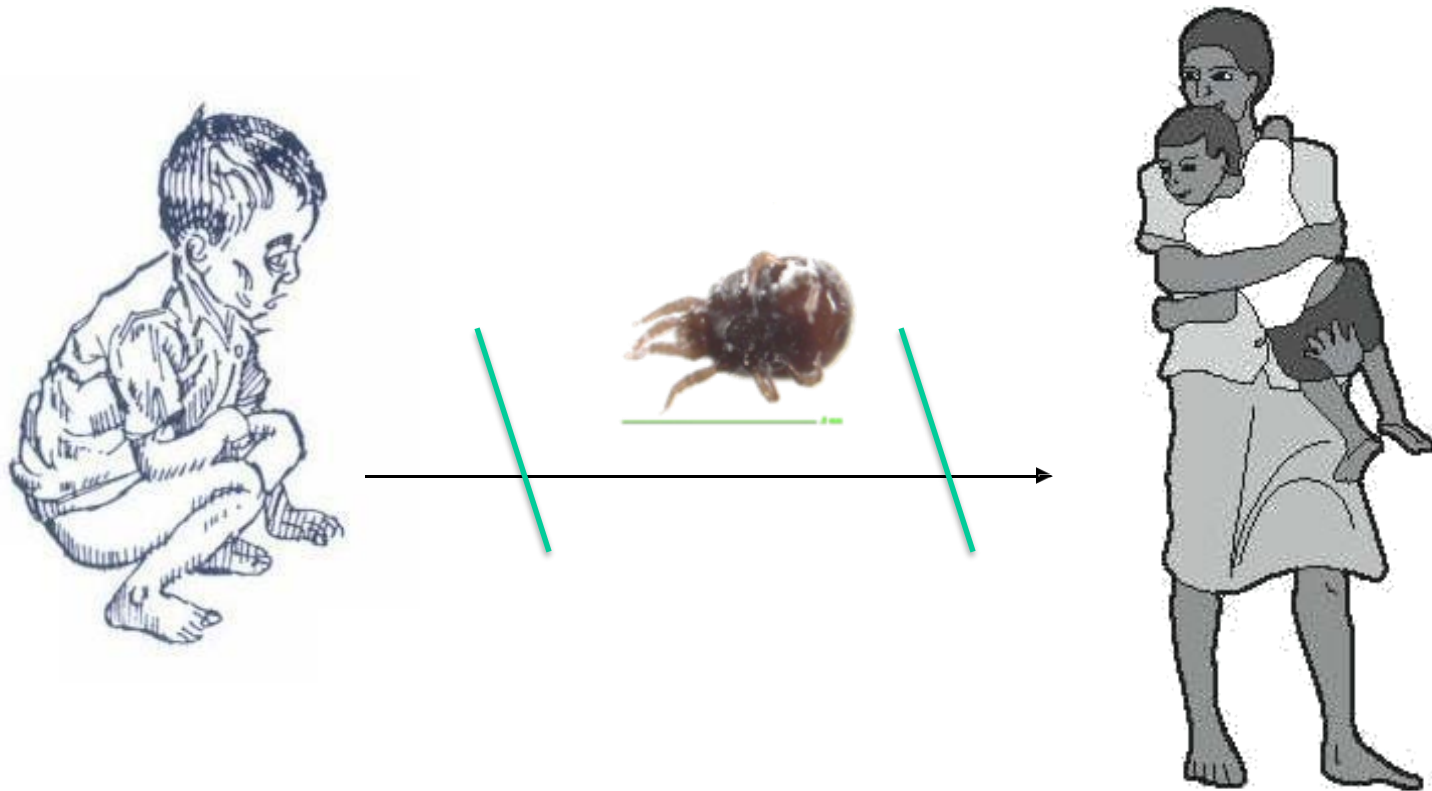


# DISEASE CONTROL



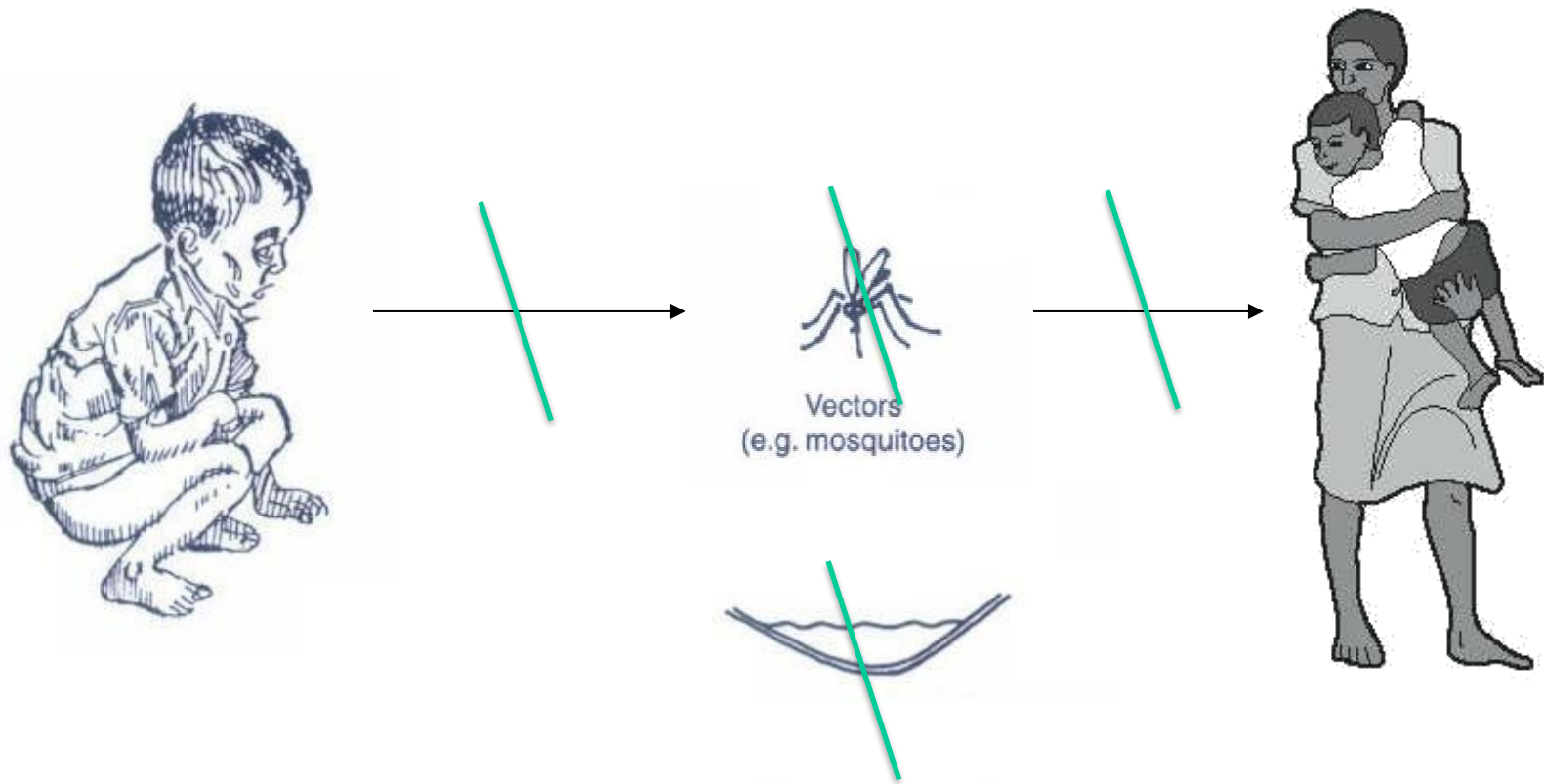


## Scabies transmission route





# Malaria transmission route



Diseases related to water	Classification according to Transmission Routes
Cholera	Water Borne & Water Washed Disease
Scabies	Water Washed Disease
Bilharzias	Water Based Disease
Malaria	Water Related Vector Disease



TRANSMISSION ROUTE	PREVENTIVE or CONTROL STRATEGIES
Water Borne (Faecal Oral)	<ul style="list-style-type: none"> <li>• Improve quality of drinking water</li> <li>• Prevent casual use of unimproved sources</li> </ul>
Water Washed (Scabies, Trachoma, Faecal Oral)	<ul style="list-style-type: none"> <li>• Increase water quantity used</li> <li>•        Improve accessibility and reliability of domestic water supply</li> <li>• Improve hygiene</li> </ul>
Water Based (Bilharzias, Guinea Worm)	<ul style="list-style-type: none"> <li>• Decrease need for contact with infected water</li> <li>• Control snail population</li> <li>• Reduce contamination of surface waters by excreta</li> </ul>
Water Related Insect Vector (Malaria, Dengue, Yellow fever)	<ul style="list-style-type: none"> <li>• Improve surface water management</li> <li>• Control breeding sites of insects</li> <li>•        Use (impregnated) mosquito net or other material</li> <li>• Use Indoor Residual Spraying or space spraying</li> </ul>

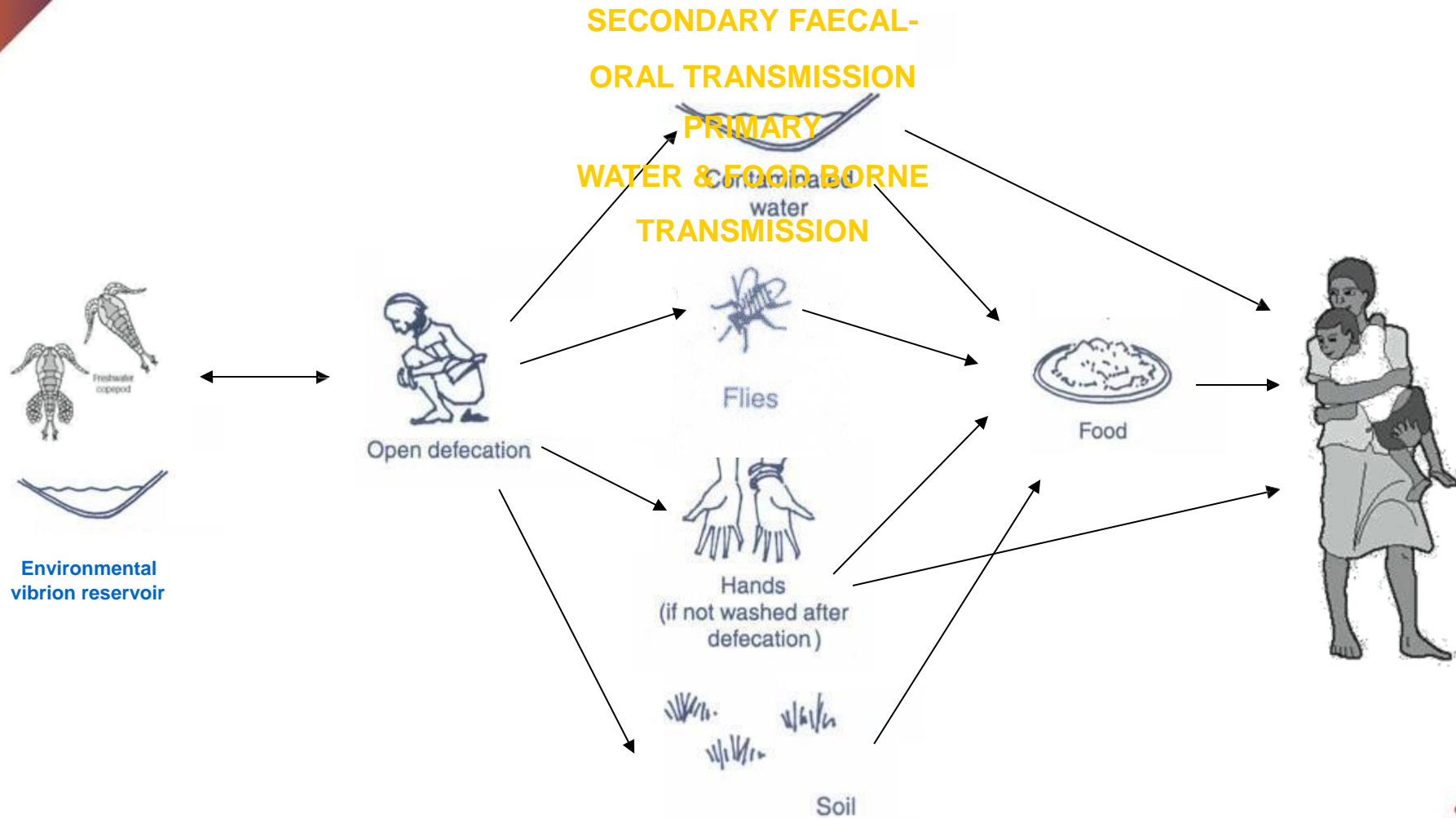


# Story of Cholera





# Cholera transmission routes



# Yemen: War zone and Cholera outbreak



# RESPONDING TO AN OUTBREAK CHOLERA





# In emergencies: need for staged intervention strategy

Starting with emergency and rapid response (MSF, first 3 months?)

Gradually shifting to longer term solutions and interventions for stable situations (usually other NGOs)





# Water needs in emergencies

## example: 10.000 people



First phase 3  
to 5 lt/p/day  
30.000 to 50.000  
lt/day



Stabilised phase  
15 to 20 lt/p/day  
150.000 to 200.000  
lt/day



Average daily use in  
India or Netherlands: 128 lt/p/day  
1.280.000 lt/day



# MSF Field Report: Clean water for Refugees in Uganda





Emergency response:  
Bangladesh:  
Deep Bore well





# Emergency response: Bangladesh





# From emergency public health to public health engineering



## Bangladesh Rohingya Emergency Response – WatSan Strategy 2018



Ref: Matt Arnold, WatSan Advisor, MSF-OCA – Cox's Bazaar, 06-12-2017









# Long term response

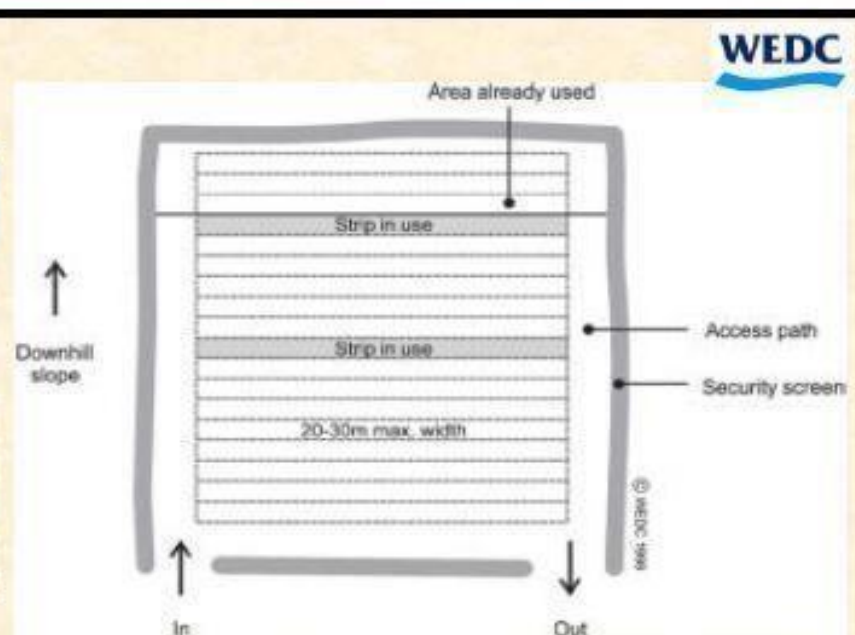
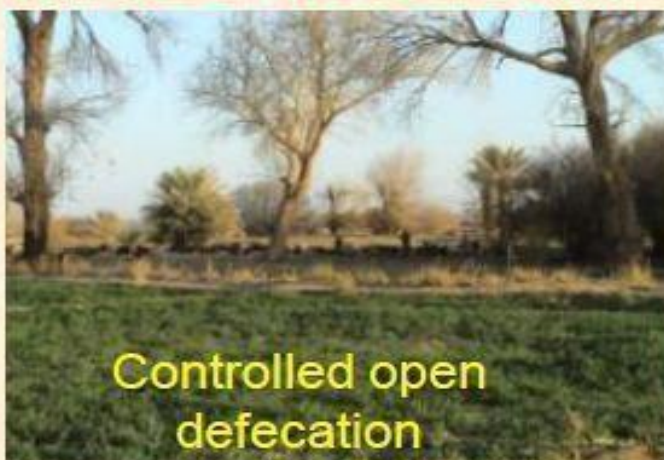


***"Sanitation is like WiFi—no one notices it until it stops working!"***





## Immediate action



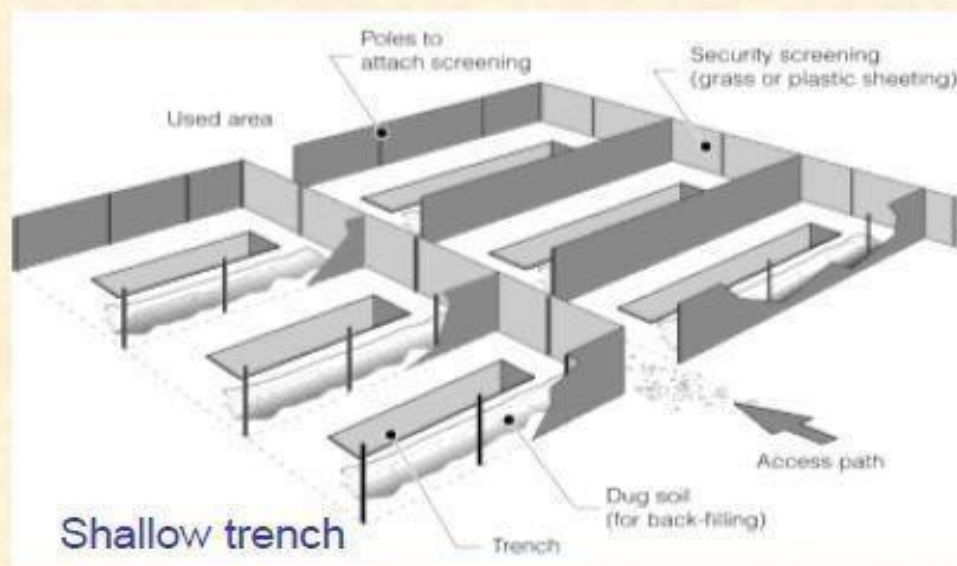
- Very limited situations where this may be acceptable ...
- far from water storage/treatment facilities, food storage/preparation, public buildings, roads
  - at least 50m from water sources
  - downhill of settlements and water sources
- not in field crops grown for human consumption

*Avoid where possible – and replace urgently!!*



## Immediate action

WEDC



Maximum of 100 people per 3.5m length of trench

150mm deep and 200-300mm wide

Allow 0.25m<sup>2</sup> of land per person per day

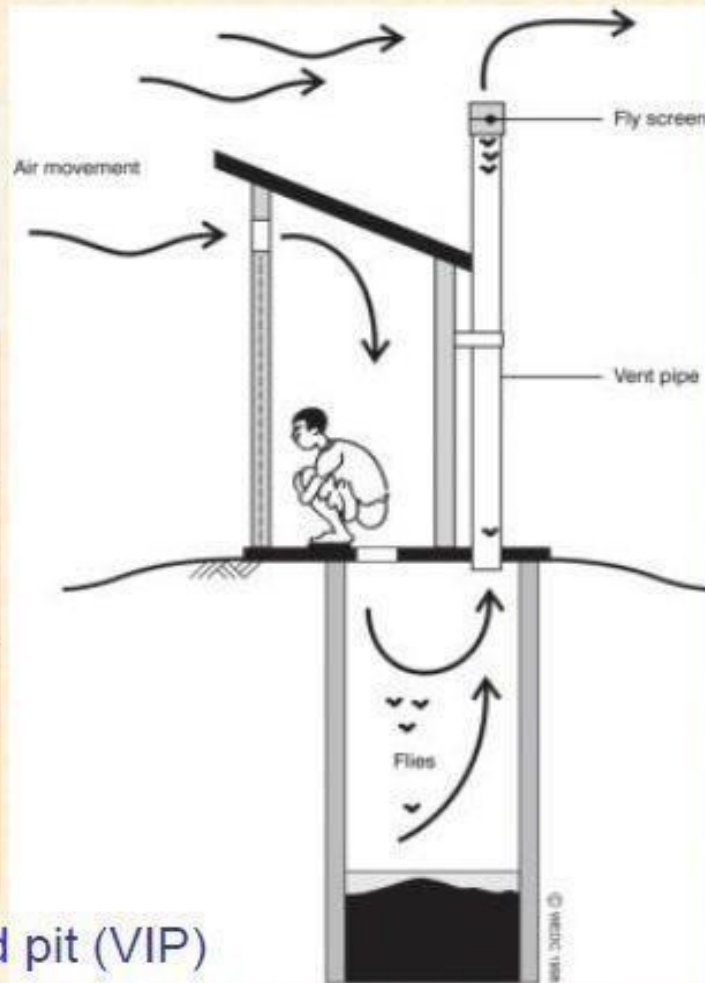




## Longer term



Ventilated, improved pit (VIP)













MSF Scientific days 2020: <https://f1000research.com/videos/9-949>





When Ebola haemorrhagic fever broke out recently in Guinea, west Africa, MSF set up three specialised treatment centres in the worst-hit areas. Ebola is so infectious – and so deadly – that patients need to be treated in isolation by staff wearing special protective clothing. Emergency coordinator **Henry Gray** and logistician **Pascal Fiquet**, both just back from Guinea, explain why, with Ebola, every little detail counts.

#### 1 Protective clothing

"The suits are so stifling that it's hard to stay inside for more than 40 minutes. We sweat a lot – up to five litres each time – but you don't look down because the owner doesn't breathe," says Pascal.

#### 2 Changing areas

Before entering the high-risk zone, staff help each other put on their protective suits, while respecting the strict 'no body-to-body contact' rule.

#### 3 Staff entrance to high-risk zone

"Each time we go in, we have to plan it down to the final detail. To prepare, we have a 30-minute meeting about what we are going to do, and we get all the equipment ready beforehand," says Pascal.

#### 4 High-risk zone: confirmed cases

After doing their rounds in the zone for suspected cases, staff enter the zone for confirmed cases. "There's a question of risk at the time – you don't want to recalculate a to do," says Henry.

#### 5 Staff exit from high-risk zone

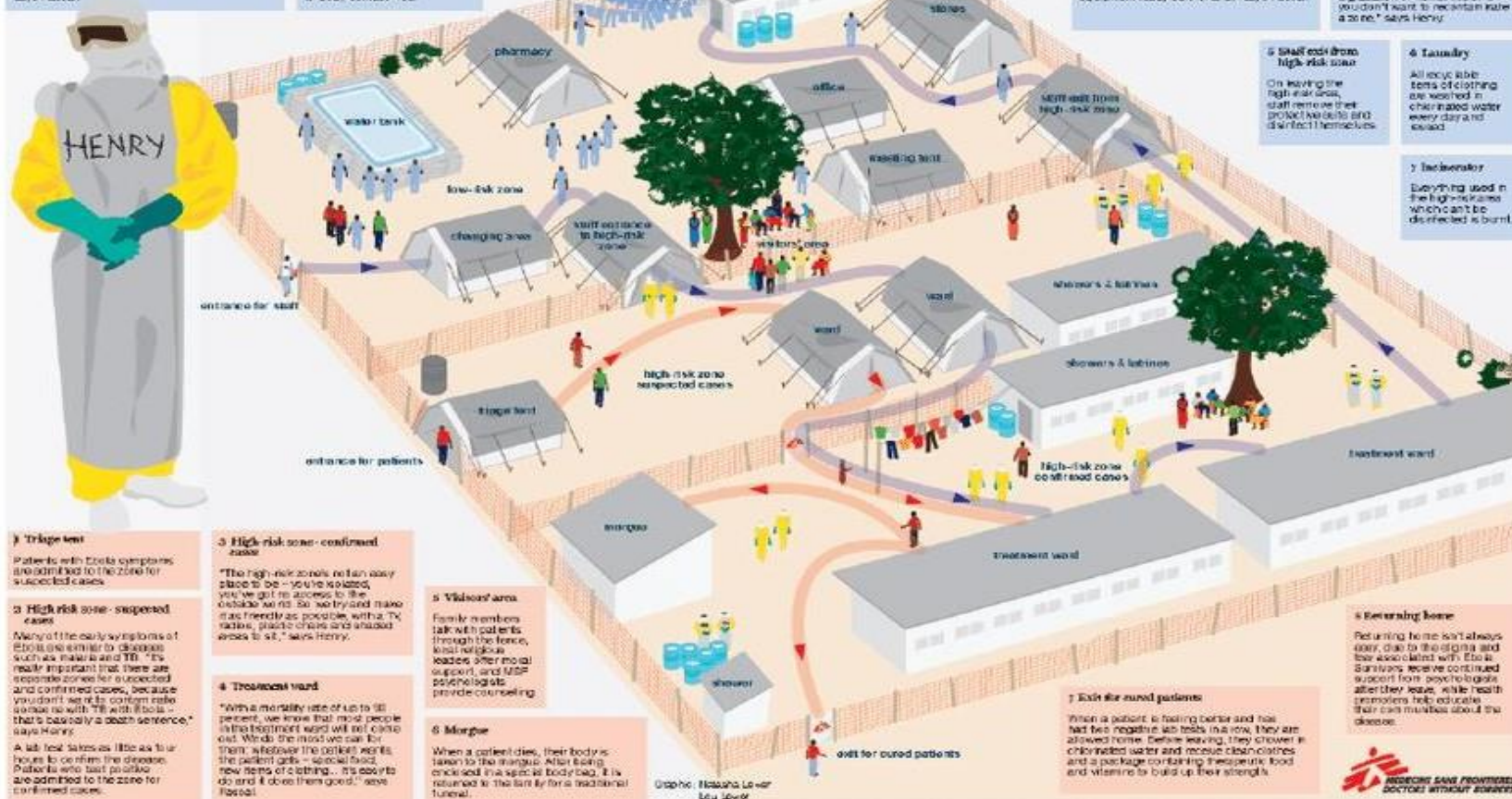
On leaving the high-risk zone, staff remove their protective suits and disinfect themselves.

#### 6 Laundry

All reusable items of clothing are washed in chlorinated water every day and reused.

#### 7 Incinerator

Everything used in the high-risk zone which can't be disinfected is burnt.



#### 8 Triage tent

Patients with Ebola symptoms are admitted to the zone for suspected cases.

#### 9 High-risk zone: suspected cases

Many of the early symptoms of Ebola are similar to diseases such as malaria and TB. "It's really important that there are separate zones for suspected and confirmed cases, because you don't want to confirm infection with TB with Ebola – that's basically a death sentence," says Henry.

A lab test takes less than 48 hours to confirm the disease. Patients who test positive are admitted to the zone for confirmed cases.

#### 10 High-risk zone: confirmed cases

"The high-risk zone is not a easy place to be – you're isolated, you've got no access to the outside world. So we try and make it as friendly as possible, with TV, radio, plastic chairs and shaded areas to sit," says Henry.

#### 11 Treatment ward

"With a mortality rate of up to 90 percent, we know that most people in the treatment ward will not come out. We do the most we can for them: whatever the patient wants, the patient gets – special food, new items of clothing. It's about to do and if does them good," says Pascal.

#### 12 Visitation area

Family members talk with patients through the fence, local religious leaders offer moral support, and MSF psychologists provide counseling.

#### 13 Morgue

When a patient dies, their body is taken to the morgue. After being encased in a special body bag, it is returned to the family for a traditional funeral.

#### 14 Returning home

Returning home isn't always easy, due to the stigma and the associated with Ebola. Survivors receive continued support from psychologists after they leave, while health workers help educate their communities about the disease.

#### 15 Exit the cured patients

When a patient is feeling better and has had two negative lab tests in a row, they are allowed home. Before leaving, they shower in chlorinated water and receive clean clothes and a package containing therapeutic food and vitamins to build up their strength.





# WASH in Health Structures



How many liters of water are required per person for a surgical procedure → **60 l/p/day**

**Water Supply** – Safe drinking water & medical use **Sanitation** – Waste management & infection control **Hygiene Promotion** – Handwashing & disease prevention. **Infection Control** – Disinfection & medical waste disposal.

Wash in health structure: foundation for infection prevention and control (IPC). MSF (also WHO) essential requirements for health structures. Fundamental for quality of care and antimicrobial resistance strategies.

**Emergency Response** – Outbreaks, cholera, and refugee camps.  
Monitoring and improvement plans

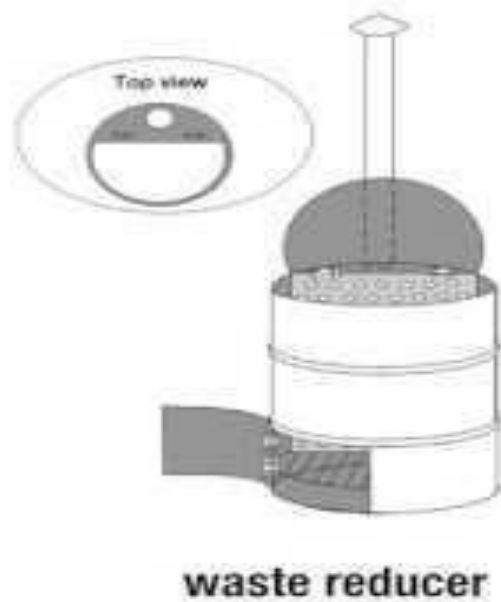


**Goal:** Ensure a safe, clean, and functional healthcare environment!



# Medical waste management

**Treatment**



# Providing water and excreta disposal is not enough



## Sanitation

- Waste water disposal
- Waste management

Wash + epidemiology = strong  
advocacy

## Hygiene

- Promotion
- Non Food Items: soap, water containers, menstrual hygiene etc.

## Vector control

- Mosquito nets, Indoor Residual Spraying (IRS), space spraying etc.

## Also think about:

- Disease surveillance
- Food, shelter, medical and social services etc.
- Coordination





# WASH in near future



**WASH with  
Climate &  
Environmental  
health =  
adaptation**



**WASH with  
Climate =  
mitigation  
(reducing carbon  
footprint)**



**Adaptation: drought  
and floods, water  
scarcity and quality,  
heat and health,  
vector borne and  
climate sensitive  
infections.**



**Mitigation: solid  
waste management  
(especially  
hazardous waste),  
management of  
waste water from  
health care.**

- Topics under development: water scarcity and quality, solid waste management (especially hazardous waste), heat and health, climate sensitive infections, management of waste water from health care.



# References

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- Sphere standards, 2018 <https://www.spherestandards.org/sphere->

[in-](#)

[2019/](#)





*Thanks for Listening Questions??*

