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CGSW Center for Global Safe WASH | Leading and Learning in WASH

# The WASH Crisis in Healthcare Facilities in Low-Income Countries: The Challenges and Sustainable Development Goal

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# Overview

- **Center for Global Safe Water, Sanitation and Hygiene at Emory University**
  - Who we are
  - Our work on WASH in healthcare facilities
- **Status: poor WASH in healthcare facilities**
  - What do we know about infrastructure, functionality, practices?
- **What are the health consequences of poor WASH in HCF?**
- **Recent WHO/UNICEF efforts to focus attention on WASH in HCF**

# Center for Global Safe WASH: Research in HCFs

GE Foundation

- Since 2011, the Center for Global Safe WASH at Emory has assessed water, sanitation and hygiene in healthcare facilities (HCFs) in low-income countries
- Funded by GE Foundation to inform their donation program of water treatment systems to HCFs
  - Ongoing research in Ghana, Honduras, Rwanda (20 HCFs)
  - New projects in Cambodia and Uganda (15+ HCFs)

Photos show various configurations of GE water filters in hospitals. Some filter water for a specific sink or ward, while others filter water for the entire hospital.

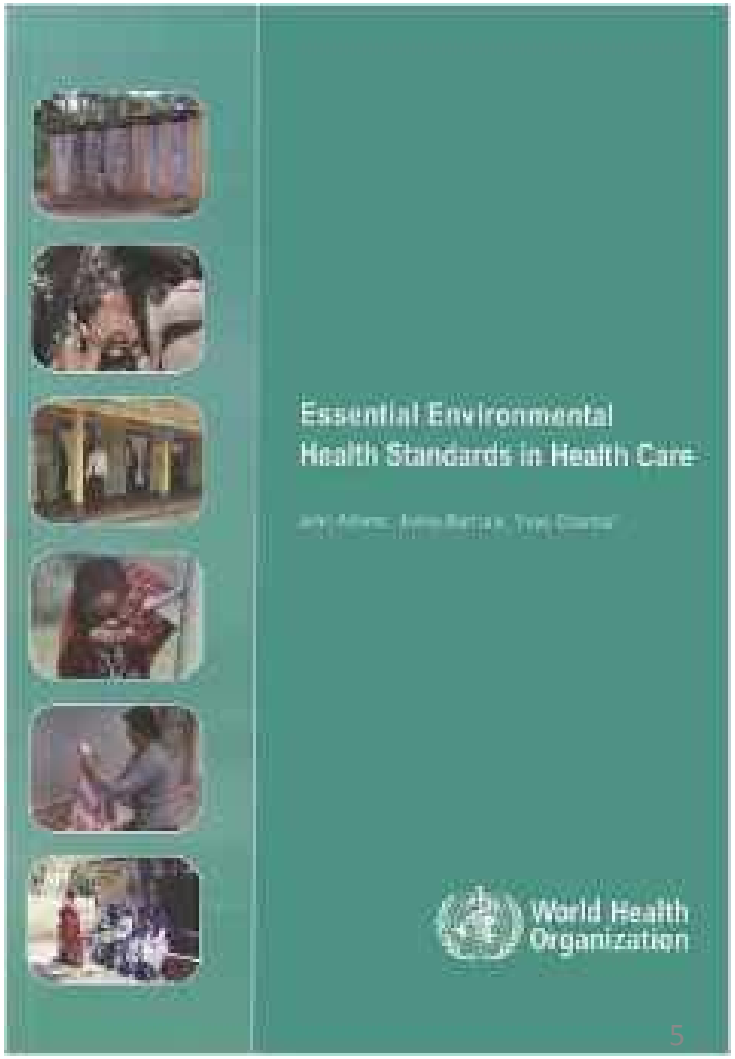
# Overview of the global status of WASH in healthcare facilities: WASH coverage and environmental conditions in health care facilities in low and middle income countries

| Indicator | Weighted coverage | Number of facilities | Number of countries |
|---|---|---|---|
| Access to an improved water source within 500 meters | **61%** | 63,609 | 51 |
| Access to improved sanitation facilities | **82%** | 59,924 | 32 |
| Access to soap for hand washing | **65%** | 38,217 | 32 |
| Adequate disposal systems for hazardous waste | **57%** | 34,112 | 24 |
| Adequate sterilization equipment for medical equipment | **55%** | 22,804 | 21 |

WHO (2015) Landscape report on the status of water, sanitation, hygiene and environmental conditions in health care facilities. Geneva:WHO.

# WHO Guidelines for WASH in Healthcare Facilities

- WHO Guidelines from 2008 for environmental health and infection control in healthcare facilities
- Implementation is incomplete in many healthcare facilities



# Proposed Indicators for Healthcare Facilities:


**Water:** % with an improved water source on premises and water points accessible to all users at all times

**Sanitation**: % with basic, separated sanitation facilities for males and females on or near premises

**Hygiene:** % with a handwashing facility with soap and water in or near sanitation facilities, food preparation areas, and patient care areas

**Menstrual Hygiene Management**: % with separated sanitation facilities for females that provide privacy; soap, water and space for washing hands, private parts and clothes; and places for changing and disposing of materials used for managing menstruation

**Accessibility:** % of health facilities with sanitation facilities that are accessible to people with disabilities

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# Complexity of water use in healthcare facilities

- **Multiple populations** with different needs:
  - Medical staff
    - Nurses, surgeons, doctors
  - Auxiliary staff
    - Cleaners, kitchen staff, etc.
  - Caregivers/Family
  - Patients
- **Multiple uses**:
  - Drinking, cooking, personal hygiene, cleaning, and laundry
  - Medical activities
- **Multiple water quality needs:**
  - Laboratory analyses, surgery, nebulizers, reconstitution of medications, drinking water, hand hygiene, bathing water, washing surfaces

# Wide Range of Water Uses in Medical Devices

- Tap water used for cleaning can contaminate a wide range of surfaces that in turn become reservoirs of contamination, such as work surfaces, utensils, and sponges.
- Tap water may also contact and contaminate indwelling medical devices, mouth wash solutions, dental water lines, solutions for therapeutic use, antiseptics, surface and instrument disinfectants, endoscopes, dialysis machines, nebulizers, humidifiers, ventilators, faucet aerators, showers, eyewash stations, incubators, autoclaves, oxygen concentrators

Adapted from Exner et al., 2005

Oxygen concentrator in Level IV Health Center in Uganda- linked to 5 neonatal deaths from sepsis

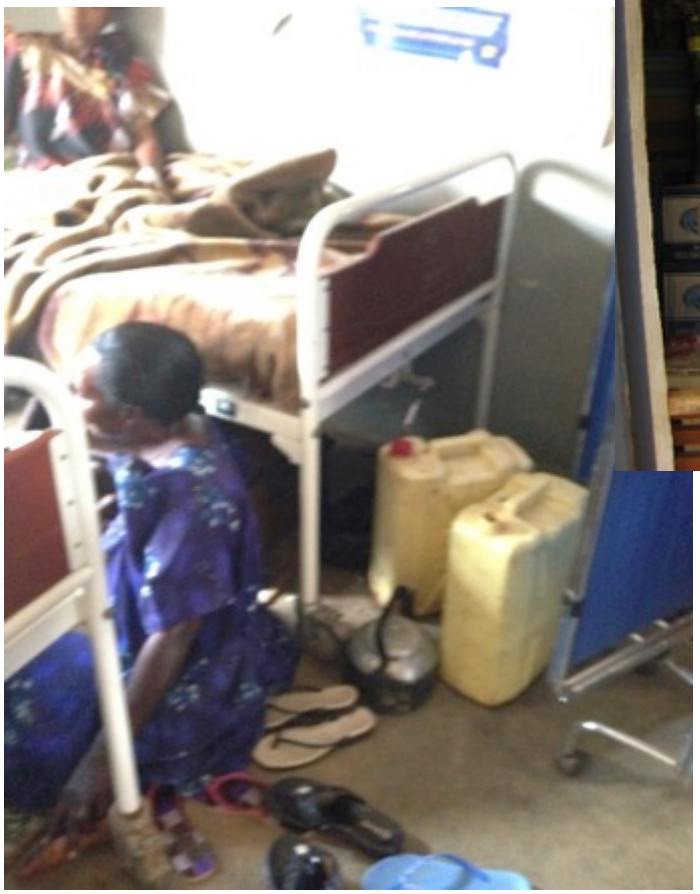
# WASH in HCFs: Off-the-Grid Water Supply

Heavy reliance on rainwater catchment and solar power, Uganda

Hospital borehole includes a non-functional play pump converted to solar power in Uganda

Level IV Health Center carries in water from this surface water supply during the dry season in Uganda

# WASH in HCFs in Uganda: Drinking Water



Patient and caregiver in Maternity Ward with her water supply and kettle. Level IV Health Center


On-site store at hospital sells bottled water, toilet paper, laundry soap, basins, powdered milk, feminine hygiene products

Patients, caregivers and visito often drink HCF tap water if accessible

# WASH in HCFs: Laundry and Bathing

Washed patient surgical gowns drying in the sun at a level IV health center in Uganda

Mother bathing 3-day infant (twin) using bottled water?

# WASH in HCFs: Sanitation and Solid Waste Management

Staff toilet in administrative building of a Level IV Health Center. Locked door. Handwashing poster on the wall, but no functional sink or soap.

Health center waste and latrine block

Blocked off toilets at hospital in Uganda

Latrine stall at hospital in Uganda

# WASH in HCFs: Hand washing stations

Non-functional sink abandoned in favor of a Veronica bucket system

Missing handwash station next to latrine block

# Infection Control in HCFs: USA vs. Uganda

Cleaning and disinfection in hospital in high-income setting

Autoclave in Level IV health center, Uganda

# WASH in HCFs in Uganda: Infection Control Measures in Maternity Wards


Three bucket system commonly observed, but disinfectant use was not consistent

# Key Characteristics of Health Care Facilities for Disease Transmission in Low-Resource Settings

- Vulnerable populations
  - infants and young children, elderly
  - ill and immunocompromised people
- Crowding
- Many pathogens – in feces, respiratory secretions, blood and other fluids
- Less resources for soap, disinfectants, and sterilization processes
- High frequency of person-to-person contact
  - Care often provided by family members "camping out" at the HCF
  - Less training of staff about infection control
- Invasive procedures
- Re-use or sharing of supplies (eg. cups for oral medication) and less disposable, single-use products
- Crumbling infrastructure – floors, walls, fixtures, pipes, beds, etc.
- Open air medical and surgical wards
- Intermittent water and power supplies creates reliance on water storage

# Healthcare-Associated Infections (HAI)

- Universal problem: estimated 5.7-19.1% prevalence (Allegranzi et al., 2010)
- Rates in industrialized countries estimated at 5-10% of all hospitalized patients (Exner et al., 2005)
- Reported average rate in studies in low-income countries is 15.5% (Allegranzi et al., 2010). How well can you measure this in healthcare facilities with limited lab capacity?
- Major types of HAIs (Allegranzi et al., 2010)
  - Surgical site infections (29%)
  - Urinary tract (24%)
  - Bloodstream (septicemia) (19%)
  - Pneumonia (15%)
  - Other (13%)
- Most common HAIs in neonates in low-income countries are due to enteric bacteria from **fecal contamination**, followed by *Staph aureus* – **due to unwashed hands**. (Zaidi et al., 2005)

# Healthcare-acquired infections in neonates and antimicrobial resistance

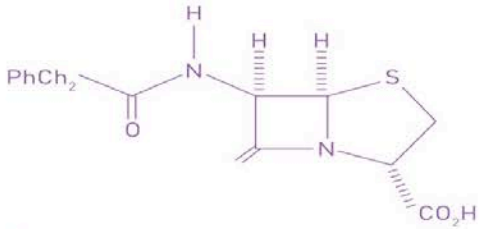
– Hospital-born babies in developing countries have reported rates of neonatal infections 3–20 times higher than those reported for hospital-born babies in industrialized countries.

- Healthcare-acquired infections in developing countries are often due to bacterial pathogens that are resistant to antimicrobial treatment.
- Estimate that 70% of pathogens isolated from bloodstream infections in hospital nurseries in developing countries may not be effectively treated by WHO-recommended regimen of ampicillin and gentamicin for neonatal sepsis
- Need to place more focus on infection **prevention** because treatment may not be effective.

Zaidi et al., Lancet, 2005

# ANTIMICROBIAL RESISTANCE

Global Report on surveillance 2014




## What you need to know

WHO's first global report on antimicrobial resistance, with a focus on antibiotic resistance, reveals that it is no longer a prediction for the future. Antibiotic resistance - when bacteria change and antibiotics fail - is happening **right now**, across the world

## What does this mean?

Without urgent action we are heading for a post-antibiotic era, in which common infections and minor injuries can once again kill

**How can infections be prevented in the first place to reduce the need for antibiotics?**

- Better hygiene
- Access to clean water and sanitation
- Infection control in healthcare facilities
- Vaccination

# WASH and Healthcare-Associated Infections among mothers and neonates

- Some evidence of increased maternal mortality associated with unhygienic water and sanitation conditions during labor and delivery (Cheng et al., 2012, Benova et al., 2014)

- "For one in five babies who die in their first month in the developing world, just being washed in clean water and cared for in a clean environment by people who had washed their hands could have prevented their untimely deaths." (WaterAid 2015)

# Ebola Transmission and WASH

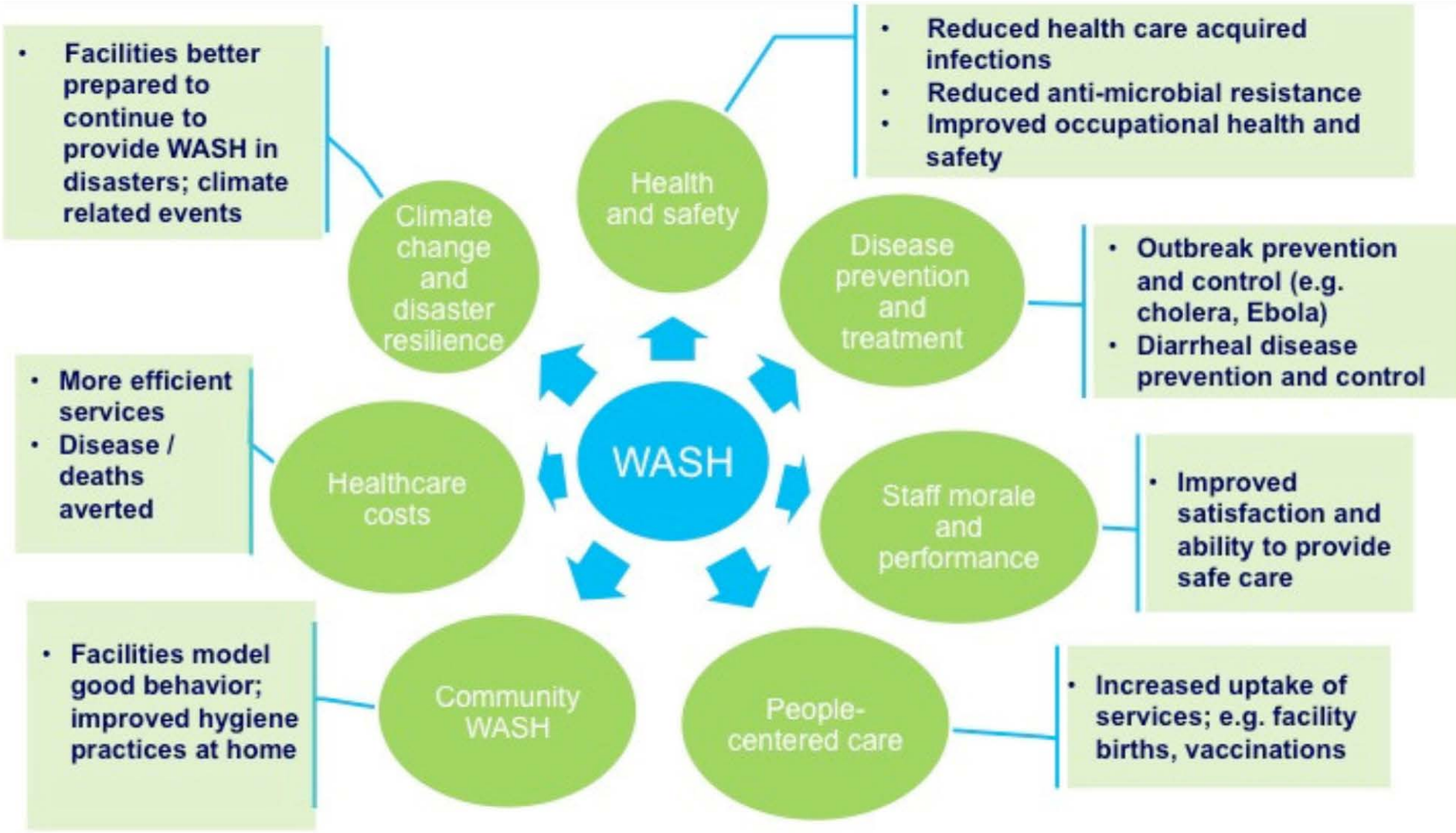
Ebola is spread to others through direct contact (through broken skin or via mucous membranes, eg. eyes, nose, or mouth) with:

- blood or body fluids (including, but not limited to: urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with Ebola
- objects (like needles and syringes, bed linens, floors) that have been contaminated with the virus
- Ebola is NOT spread by water

- Virus characteristics suggest Ebola virus has limited survival in the environment, but conflicting evidence about this.
- Good WASH infrastructure and practices at HCFs with Ebola patients is CRITICAL!
  - WHO recommendations
  - **Sanitation**: Safe handling, containment, and treatment of excreta at sites caring for Ebola patients
  - **Hygiene:** Availability and use of running water, soap, chlorine disinfectants

http://www.cdc.gov/vhf/ebola/transmission/

# Why is WASH in HCFs important?




*Adapted from: WHO/UNICEF, 2015. Water, sanitation and hygiene in health care facilities: status in low- and middle-income countries and way forward.*

# Key Water Access and Quality Challenges in Health Care Facilities in Low-Resource Settings

- Poor water **availability**
  - Often reliance on several water sources
  - Chronic or seasonal lack of water
  - Locked taps
  - Broken boreholes
  - Intermittent supply (May be linked to power failures, non-payment of bills, or water rationing by the water utility)
  - Low pressure
- Poor water **quality**
  - Lack of water treatment
  - Post-treatment contamination in plumbing
  - Lack of water quality monitoring
  - Degradation of microbiological water quality in storage buckets in wards

# Summary: WASH in HCF is different

## Challenges

- Lots of vulnerable people and pathogens
- Lots of hazardous waste and contaminated areas
- Specific requirements due to limited mobility of patients
- Diversity of:
  - Healthcare Facilities (1°, 2°, 3°)
  - Users (patients, staff, visitors)
  - Water uses for different purposes
  - Wastes (biological, chemical, sharps)
- WASH in HCF often falls between health and environment sectors. Recently recognized issue in the WASH sector.

## Opportunities

- Health care staff are highly credible, can promote hygiene behaviour change
- Healthcare staff are resourceful at dealing with poor WASH infrastructure
- Health facilities can function as a role model for good hygiene and proper management of waste, water and sanitation

Adapted from Dr. Rick Johnston, WHO

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# Sustainable Development Goal 6 - WASH in HCF

- The 2015 Sustainable Development Goals include a target to achieve "**universal access to safe drinking water in health facilities by 2030**." **Goal 6**

- **Majority of healthcare facilities will require onsite treatment** in order to meet safe drinking water guidelines.

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