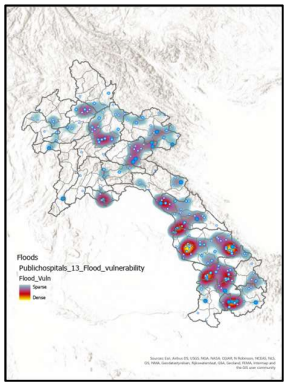


LAO PDR

WASH Services During Government of Lao PDR Emergencies

Ministry of Health

STANDARD GUIDELINE FOR WASH SERVICES IN HEALTH CARE FACILITIES DURING EMERGENCIES

25 December 2023

Foreword

As we stand at the nexus of health and emergency response, the Department of Health and Hygiene Promotion recognize the paramount importance of ensuring water, sanitation, and hygiene (WASH) services in healthcare facilities, particularly during times of crisis. The vulnerability of our communities to various emergencies, including natural disasters and disease outbreaks, necessitates a comprehensive approach to healthcare delivery including the accessibility to WASH services in healthcare facilities.

This guideline is written with a multifaceted purpose, addressing key objectives to underscore the paramount importance of WASH services during emergencies. It aims to secure a reliable source of clean water for various purposes, maintain clean and accessible sanitation for all individuals within healthcare facilities, ensure the proper management and disposal of healthcare waste, control infection and maintain environmental health, all while complying with established national standards. At the national level, this guideline facilitates collaboration with humanitarian organizations during larger-scale emergencies and emphasizes community involvement, encouraging local participation and support in maintaining WASH services for healthcare facilities during crises.

We envision this guideline as a living document that evolves with the changing landscape of emergencies and public health challenges, and that can be adapted to diverse emergency scenarios at sub-national levels. It reflects international best practices while considering the specific context and needs of our nation. The objective is not merely compliance but rather the fostering of a culture of preparedness, resilience, and continual improvement within our health care facilities.

In conclusion, the Department of Health and Hygiene Promotion expresses gratitude to all stakeholders involved in developing this guideline. We urge its diligent implementation across all healthcare facilities, representing our collective commitment to ensuring the resilience of healthcare systems in the face of emergencies.

Deputy Director

Dr. Bouakeo Souvanthong
Deputy Director
Department of Hygiene and Health Promotion

Acronyms

MoH	Ministry of Health
WASH	Water Sanitation and Hygiene
NDMC	National Disaster Management Committee
WHO	World Health Organization
ERT	Emergency Response Team
PPE	Personal protective equipment
MHH	Menstrual Health and Hygiene
IPC	Infection Prevention and Control
HCFs	Health Care Facilities

A: STANDARD GUIDELINE FOR WASH SERVICES IN HCFs DURING EMERGENCIES

Table of Contents

SECTION 1: Basic background

1. Introduction

1.1. Purpose of the STANDARD GUIDELINE

The key objectives of developing this "Standard Guideline" for WASH services during emergencies in Health Care Facilities (HCFs) are:

- Ensuring adequate water supply: secure a reliable source of clean water for drinking, medical and sanitary purposes without causing any affect to public health.
- Maintaining clean, functional, and accessible sanitation for all (staff, health care workers, patients) and its adequate management in all service chain with cautions on public health
- Adequate Health care waste management / disposal without contaminations
- Compliance of WASH with the national legal and regulatory standards

This STANDARD GUIDELINE will serve the purpose of structuring and coordinating the WASH response during emergencies. This will be the basis for sub-national level WASH responses and may require contextualizing in different scenarios of emergencies.

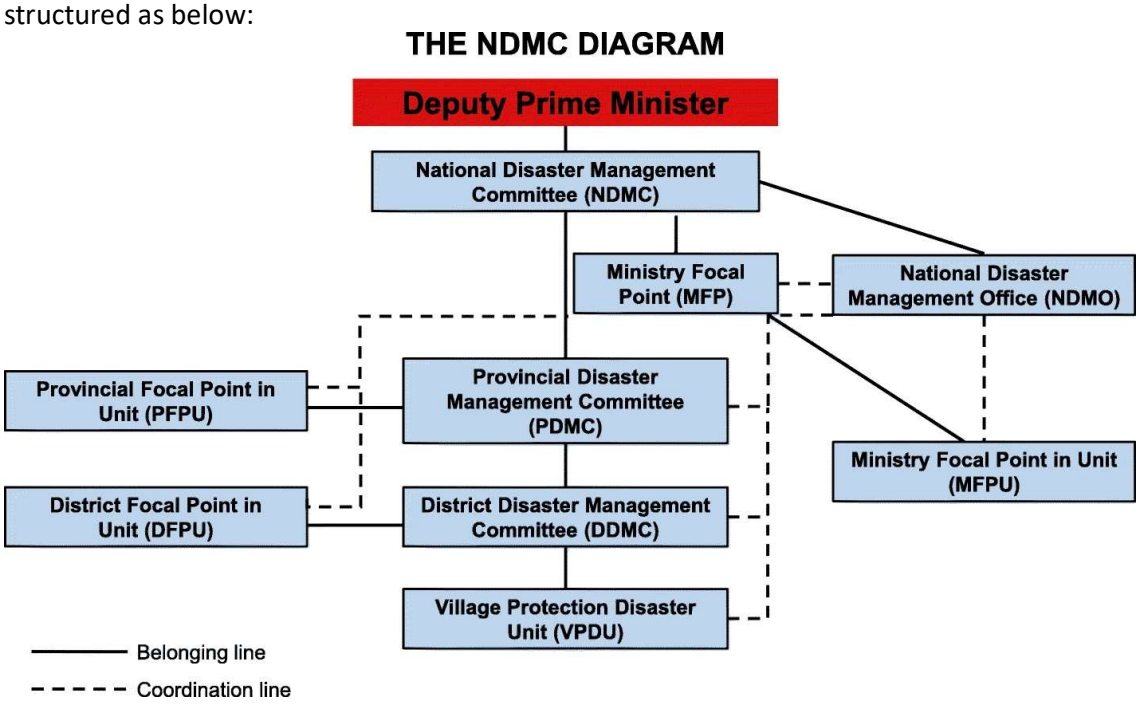
1.2. Scope and applicability

Scope	Applicability
• The STANDARD GUIDELINE primarily applies to **all types of healthcare facilities**, including hospitals, clinics, nursing homes, and other medical centers, whether they are public or private. • The STANDARD GUIDELINE is designed to be used during a **wide range of emergency situations**, such as natural disasters (e.g., earthquakes, floods, droughts, and storms), public health emergencies (e.g., pandemics, disease outbreaks), conflict situations, and any other crisis that may disrupt regular WASH services. • The STANDARD GUIDELINE covers a broad range of WASH-related topics, including **water supply, sanitation, hygiene, waste management, infection control, and environmental health**. It addresses measures for ensuring the availability, accessibility, and safety of these services during emergencies. • The STANDARD GUIDELINE can be **adapted to various geographic locations** and settings, both urban and rural as well as national and sub-national. Specific provisions should be made for any	General to all tiers of government • The STANDARD GUIDELINE is applicable to **all healthcare staff** working within the healthcare facility, including doctors, nurses, administrators, and support personnel/ workers. It outlines their roles and responsibilities in maintaining WASH services during emergencies. • The STANDARD GUIDELINE is relevant to the facility management team responsible for **overseeing the maintenance and operation of WASH infrastructure** and systems. • The STANDARD GUIDELINE is used by **emergency response teams** within healthcare facilities, ensuring they have clear guidelines for responding to WASH-related challenges during crises. • The STANDARD GUIDELINE can be shared with and is applicable to **local health departments, regulatory bodies**, and emergency management agencies to ensure compliance and coordination with healthcare facilities in emergency situations. Specific to national government: • In larger-scale emergencies, the STANDARD GUIDELINE can also be relevant to **humanitarian organizations**

unique regional or local conditions and contexts.	providing assistance to healthcare facilities. It helps in establishing coordination and collaboration between healthcare facilities and external support agencies. • The STANDARD GUIDELINE may include provisions for community involvement and is applicable to **local communities** in the vicinity of healthcare facilities. This encourages local participation and community support in maintaining WASH services for healthcare facilities during emergencies. • The STANDARD GUIDELINE is used for **training healthcare staff,** emergency response teams, and community members, ensuring they are well-prepared to implement WASH protocols during emergencies.

1.3. National institutional arrangements for emergencies

The Government of Lao PDR current institutional arrangement for the emergencies response structured as below:

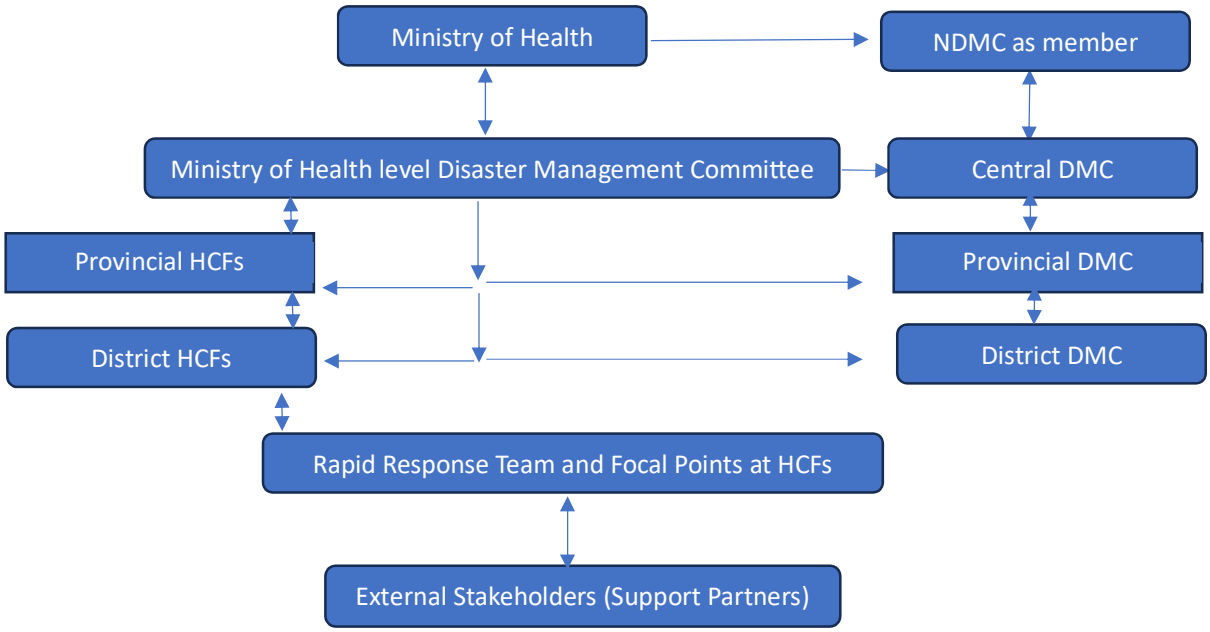


The composition of central level Disaster Management Committee consist of:

1. **Deputy Prime Minister President;**
2. Minister of Labor and Social Welfare Vice President, Standing Member;
3. Deputy Minister of National Defense Vice President;
4. Deputy Minister of Finance Vice President;

5. Deputy Chief of Cabinet, Prime Minister Office Member;
6. Deputy Minister of National Resource and Environment Member;
7. Deputy **Minister of Health** Member;
8. Deputy Minister of Education and Sports Member;
9. Deputy Minister of Agriculture and Forestry Member;
10. Deputy Minister of Public Works and Transport Member;
11. Deputy Minister of Public Security Member;
12. Deputy Minister of Planning and Investment Member;
13. Deputy Minister of Foreign Affairs Member;
14. Deputy Minister of Information, Culture and Tourism Member;
15. Deputy Minister of Energy and Mines Member;
16. Deputy Minister of Home Affairs Member;
17. Deputy Minister of Science and Technology Member;
18. Vice President of Central Lao Front for National Development Member;
19. Deputy Secretary General of Central Lao Youth Union Member;
20. Vice President of Lao Red Cross Member;
21. **Director General of Social Welfare Department, Ministry of Labor and Social Welfare**

The coordination mechanism for Ministry of Health during emergencies:



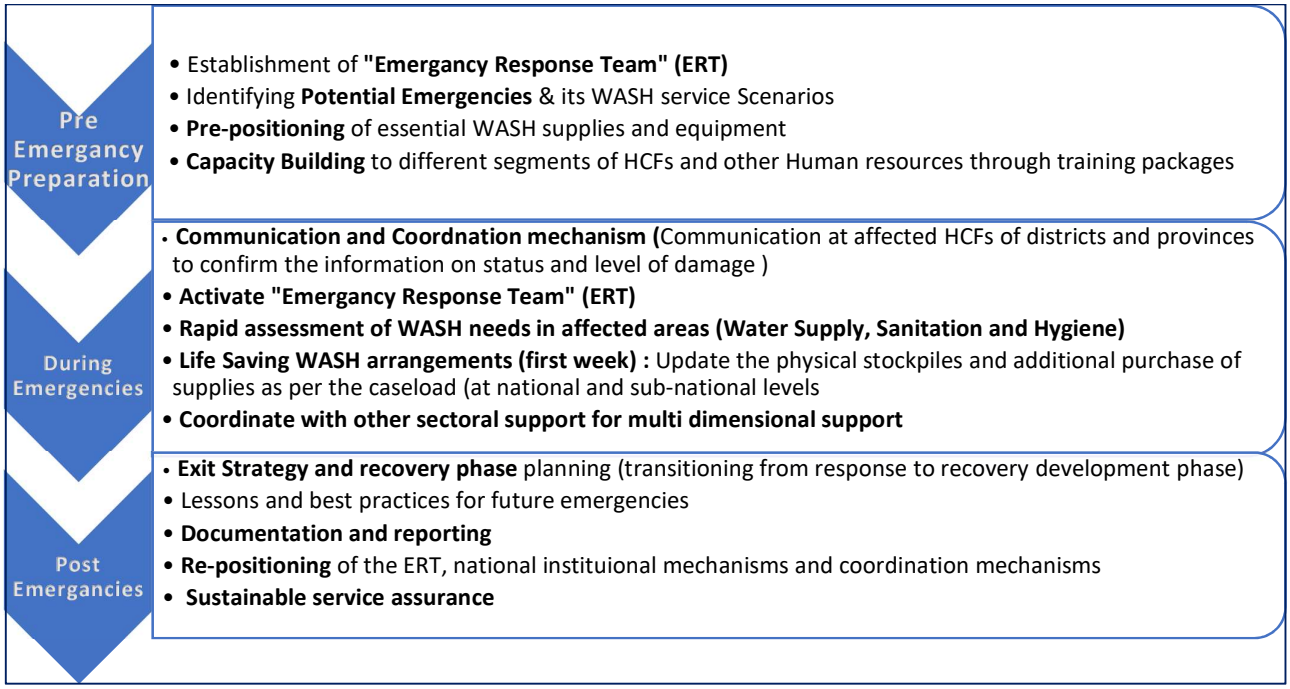
The nodal ministry for disaster response is the Ministry of Labor and Social Welfare. And for HCFs and its WASH services Ministry of Health is the focal ministry. Besides the central level Disaster Management Committee, any Ministry, with the necessity to do so, may establish **ministry level Disaster Management Committee**, to act as an assistant body to the central level Disaster Management Committee as well as a coordination point, in accordance with agreement of the relevant Minister or Head of organizations. Central, provincial and district level Disaster Management Committee have the right and duty, within in their scope of responsibility.

HCFs nodal Ministry "Ministry of Health" is to set up a coordination meeting with all the relevant stakeholders within 6 hours of announcement of disaster with defined time and venue set. This is crucial for operationalizing the response within less than 24 hours of the disaster effectively and efficiently. And this is also to activate the WASH cluster for the immediate response on WASH to HCFs along with other institutions & households.

The standard functional procedure to initiate the response of HCFs during emergencies:

TIME (hours / Days)	Response steps	Remarks
Within 12 hours	• MOH to lead the coordination meeting with all available stakeholders with defined time and venue to reflect the intensity of emergency and WASH needs and capacity (immediately after emergency and later from daily to weekly as per the intensity of the emergency)	MOH to lead the coordination with support partners
Within 24 hours	• Activate the response mechanism at MOH /Department of Hygiene and Health Promotion (DHHP) with support mechanism defined with partners	Hot spots of affected and caseloads, WASH support
Within 24 hours	• Focal point at MOH for overall communication and coordination as Spokesperson	DHH can also be the alternative in support of WASH Cluster activated
Within 24 hours	• Communication at affected HCFs of districts and provinces to confirm the information on status and level of damage	HCFs focal present at districts and province as firsthand information
Within 24 to 48 hours	• Activate Emergency Response Team at district and province level • Update the physical stockpiles and additional purchase of supplies as per the caseload (at national and sub-national levels • Life saving support provided to affected districts • Based on need response reorganize the Assessment Team from central level if required	In coordination with the local government
Within 72 hours	• Focal points at provincial level and district level HCFs for the information / data and coordination (within and at multi sectoral level) • Set up Information Management System (4Ws) and reporting mechanism on daily basis	HCFs to facilitate this reporting
From 72 hours to 7 days	• Hygiene promotion campaign to prevent outbreaks multi disaster scenarios • In case of camp settings and displacements, immediate life saving WASH supplies and services in coordination with local government	Other external support partners can be mobilized but with clear message as per the context
From 4 days to 2 weeks	• Possible camp settings that may exceed to one month to be critically planned for WASH services • Roll out the recovery plan in affected area • Monitoring • Decommissioning the temporary services	Exit strategy and recovery plan

Action Steps for WASH Services in HCFs during Emergencies: Synopsis



SECTION 2: Pre-Emergency Preparation

2. Emergency Preparedness

2.1. Establishing an Emergency Response Team (WASH in HCFs)

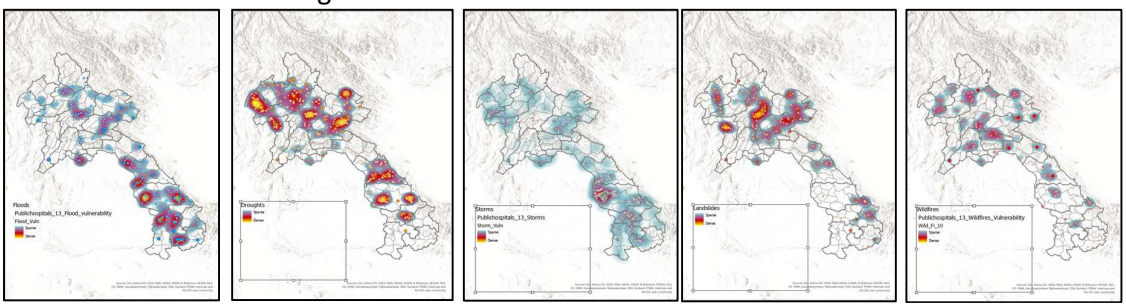
Establishing an Emergency Response Team for Water, Sanitation, and Hygiene (WASH) in Healthcare Facilities (HCFs) in Lao PDR is a crucial step in ensuring that these facilities are prepared to respond to emergencies and provide essential WASH services during crises such as natural disasters, disease outbreaks, or other emergencies.

- Develop an [1]emergency response plan specific to each healthcare facility. This plan should outline roles and responsibilities, resource needs, and the necessary steps to be taken in an emergency.
- Identify and select qualified staff members (5 to 7) for each HCFs, who will be part of the Emergency WASH Response Team. But this required backstopping focal team from MOH as well. This team should include individuals with expertise in WASH, medical staff, logistics, and management.
- Define the roles and responsibilities of each team member. Ensure that they are well-trained and familiar with emergency response procedures in various emergency scenarios.

2.2. Identifying potential emergency scenarios in Lao PDR

The assessment of various emergencies vulnerability situation is:

i. Flood ii. Droughts iii. Storm iv. Landslides v. wildfire



This assessment indicates the vulnerability of flood, drought and storm are equal across the state both north and south. However, for landslides and wildfire the focus to be on the north as per its high vulnerability.

[1] Emergency Water Supply Planning Guide for Hospitals and Healthcare Facilities :https://www.cdc.gov/healthywater/emergency/pdf/emergency-water-supply-planning-guide-2019-508.pdf

The 2018 dam collapse and 2018 flood in Oudomxay were the lessons learnt scenarios in case of response preparedness. The key concerns are a. immediate response b. coordination mechanism.

i. Lao Dam Collapse (2018)

ii. Oudomxay Flood (2018):

2.3. Pre-positioning of essential WASH supplies and equipment

Pre-positioning essential Water, Sanitation, and Hygiene (WASH) supplies and equipment in Lao PDR is a critical component of disaster preparedness and response in relation to the five vulnerable scenarios in previous chapter. It involves strategically storing necessary items in advance of an emergency to ensure a rapid and effective response. It is regular updates,

replacements, and inventories with operational mechanisms. Pre-positioning WASH supplies and equipment in Lao:

- Thorough assessment of the WASH needs in Lao PDR, considering the specific geographical, climatic, and environmental factors that influence emergency situations.
- Identify the types and quantities of WASH supplies and equipment required for diverse types of emergencies mentioned above.
- Identify suitable storage facilities that are strategically located (central and sub-national) to ensure quick access to affected areas during emergencies. These facilities should be secure, climate-controlled (if necessary), and designed to protect supplies from damage or theft.
- Establish an inventory management system to keep track of stored items, monitor expiration dates, and ensure regular inspections and maintenance.
- Pre-position a range of essential WASH supplies and equipment, including but not limited to:
    - Water treatment and purification equipment / solutions
    - Water containers and distribution systems
    - Sanitation facilities (e.g., latrines, portable toilets)
    - Hygiene and sanitation kits
    - Personal protective equipment (PPE)
    - Cleaning and disinfection supplies
    - Emergency medical supplies
- Develop logistics and transportation plans to ensure that pre-positioned supplies and equipment can be quickly and efficiently mobilized when needed. For this establish agreements with local transport companies, and ensure the availability of vehicles, fuel, and drivers to transport supplies to affected areas. Ensure that there is a clear understanding of roles and responsibilities among all involved parties.
- Collaborate with national and local government agencies, humanitarian organizations, and other relevant stakeholders to coordinate pre-positioning efforts and share information on the location of stored supplies. With list of stockpiles that all agencies have with its sufficiency assessment as per the caseload predicted. This will identify the gaps to be filled.
- Involve local communities in disaster preparedness and response efforts. Educate them about the location of pre-positioned supplies and how to access them in case of emergencies. Establish community-based mechanisms for reporting emergencies and requesting WASH assistance.
- Secure funding or allocate budgets for pre-positioning efforts. Seek financial support from donors, government agencies, or international organizations to maintain and replenish supplies. Develop a sustainable funding mechanism to continuously improve and expand pre-positioning capabilities.

2.4. Training and capacity building for WASH personnel

Training and capacity building for Water, Sanitation, and Hygiene (WASH) personnel responsible for emergency WASH services in healthcare facilities in Lao PDR is crucial to ensure a coordinated, effective, and safe response during emergencies.

- A comprehensive needs assessment to understand the existing knowledge and skills of WASH personnel in healthcare facilities. Identify gaps in their capacity related to emergency response and WASH services.
- Create a training plan that outlines the specific training needs, objectives, curriculum, and methodologies. Consider the diverse roles within the healthcare facility, including

healthcare professionals, WASH specialists, maintenance staff, and administrative personnel, and tailor the training accordingly.

- Develop training modules and conduct trainings covering essential topics with certification related to emergency WASH services, including:
    - Disease outbreak response
    - Water source and quality management
    - Sanitation and hygiene management and promotion
    - Infection prevention and control
    - Emergency logistics and supply chain management
    - Psychosocial support for healthcare personnel
    - Emergency communication and coordination (communication tree)

Ensure that training materials and content are accessible to participants who may speak various languages and come from diverse cultural backgrounds from various ethnic groups and cultures. Include cultural sensitivity training to promote understanding and respectful interactions with patients and community members.

3. Activation of the Emergency Response

3.1. Activation criteria and decision-making process

As per the recent criteria and protocols in emergencies, some of the key criteria and decision-making processes to be followed for activation of Emergency Response are:

Activation Criteria	Decision- making process
• The activation of an emergency response typically begins with the declaration of a disaster. • The National Disaster Management Plan (NDMP) outlines the activation criteria for diverse types of emergencies. • As per NDMP, activating an emergency response plan often depends on the nature and scale of the emergency as indicated in NDMP depending on the type of disaster. • If early warning systems indicate an imminent threat or occurrence of a disaster, authorities might decide to activate the emergency response mechanism. • The National Disaster Management Office (NDMO), local authorities, and response organizations, are notified. Coordination among these entities is initiated to ensure an organized response. • Government agencies and local authorities assess the scale and impact of the disaster. This assessment may include evaluating the extent of damage, the number of affected people, and the immediate and long-term needs of the affected population. • In cases where local authorities are overwhelmed or unable to manage the situation, requests for assistance from the central government or international agencies may trigger the activation of the emergency response plan.	• Communication between relevant government agencies, local authorities, and international organizations is crucial. This coordination plan is to be prepared as a part of emergency response with contacts, time, venue, and list in occurrence of disaster not exceeding 6 hours in the occurrence. This facilitates the sharing of information, assessment of the situation, and formulation of a response plan. • A comprehensive assessment of the impact of the disaster and the needs of the affected population (Caseload) is conducted. This includes evaluating the extent of damage, the number of affected people, and their immediate needs such as food, WASH, shelter, and medical assistance. • Depending on the severity of the emergency, resources such as personnel, equipment, and financial aid are to be pinned and mobilized at the national and international levels to support the affected areas. • Once the response plan is formulated, it is implemented promptly within 24 hours, with clear roles and responsibilities assigned to different stakeholders involved in the emergency response process. • Ensure that the needs of the affected population are being met and that any gaps or challenges are addressed promptly.

3.2. Communication and coordination mechanisms

Establishing effective communication and coordination mechanisms for emergency response from health care facilities is crucial for timely and efficient management of emergencies and disasters. While the specific systems and protocols may evolve over time, depending on the type of disaster, there are some generic protocols of coordination to be followed:

- Develop and maintain a comprehensive national emergency response plan that outlines roles, responsibilities, and communication protocols for various healthcare facilities and emergency responders across the country.
- Implement a centralized communication system *(with clear communication tree / channel defined and drilled)* that allows healthcare facilities to quickly and effectively communicate with each other and with relevant government agencies during emergencies. This system could include hotlines, dedicated communication channels, and digital platforms for real-time information exchange.
- Healthcare facilities should also communicate with the public, providing instructions and information about where to seek help during an emergency. This can include using radio, TV, and local community outreach.
- Proper information management systems are necessary for collecting and disseminating information about the emergency's impact, patient status, available resources, and critical needs. These systems can facilitate communication between healthcare facilities and emergency response coordination centers.
- Conduct regular emergency response drills and training programs for healthcare workers to ensure that they are familiar with the communication and coordination protocols. These drills can help identify gaps and areas for improvement in the existing mechanisms.
- Foster strong partnerships and collaboration with local authorities (as they are the frontline channel for real time information) including law enforcement, fire departments, and other emergency response agencies, to establish a coordinated approach to emergency response.
- Explore the use of technology, such as telemedicine, mobile applications, and digital platforms, to facilitate communication and coordination between healthcare facilities during emergencies. This can enable real-time data sharing and enhance decision-making processes.
- Engage with local communities to raise awareness about emergency response protocols and encourage their active participation in disaster preparedness and response efforts. Community involvement can significantly improve the overall effectiveness of emergency response initiatives.
- Set up regional, sub-national response centers equipped with the necessary communication infrastructure and trained personnel to coordinate emergency response activities at the regional & sub-national level.
- Form multidisciplinary task forces comprising healthcare professionals, public health experts, and other relevant stakeholders to facilitate effective communication and coordination across different sectors during emergencies.
- Align communication and coordination mechanisms with national & international standards and best practices in emergency response to ensure interoperability and effective collaboration with international aid organizations during large-scale emergencies or disasters.

3.3. Rapid assessment of WASH needs in affected areas.

Performing a rapid assessment of Water, Sanitation, and Hygiene (WASH) needs in health care facilities during a disaster in Laos requires a focused and efficient approach. It is crucial to ensure that the health care facilities can continue to operate effectively and provide essential services to the affected population. Here is a step-by-step guide on how to perform a rapid assessment of WASH needs in health care facilities during a disaster.

- Ensure the safety of the assessment team and prioritize the safety and well-being of the patients and staff in the health care facility.
- Understand the nature and scale of the disaster and assess how it has specifically impacted the health care facility. Consider factors such as accessibility, infrastructure damage, and the immediate health care needs of the affected population.
- Collect data on the status of WASH facilities and services (all three components are to be equally prioritized i. Water ii. Sanitation iii. Hygiene) within the health care facility. This includes assessing the availability of clean water, functioning sanitation facilities, and the hygiene practices of the staff and patients.
    - Water Availability: Assess the availability and accessibility of clean water sources. Identify any contamination or damage to water supply systems.
    - Sanitation Facilities: Evaluate the status of existing sanitation facilities, including toilets, latrines, and waste management systems. Assess the risks of contamination and the need for urgent repairs or temporary solutions.
    - Hygiene Practices: Determine the hygiene practices within the affected communities, identifying gaps and needs for promoting proper hygiene behavior.
- WASH Infrastructure Damage: Document the damage to water and sanitation infrastructure, including pipelines, water treatment plants, and sewage systems.
- Assess the availability and quality of water supply within the facility. Determine if there is any damage to water storage and distribution systems that need immediate attention.
- Evaluate the condition of sanitation facilities such as toilets, handwashing stations, and waste management systems. Identify any damage or contamination that could pose a risk to the health of patients and staff.
- Evaluate the existing hygiene practices of the staff and patients. Identify any gaps in knowledge or resources that might be hindering proper hygiene practices. This should focus on the two components, i. hand washing ii. Menstrual hygiene
- Prioritize critical needs that must be addressed immediately to ensure the continuity of essential health services. This may include repairing or setting up temporary WASH facilities, providing hygiene kits, and ensuring the availability of clean water for medical procedures.
- Based on the assessment findings, develop a clear and concise action plan that outlines the specific steps needed to address the identified WASH needs. Ensure that the plan includes short-term solutions for immediate relief as well as long-term strategies for sustainable WASH support.
- Collaborate with local authorities, health organizations, and relief agencies to ensure a coordinated and effective response. Share the assessment findings and action plan to facilitate targeted assistance and avoid duplication of efforts.

It is essential to conduct the rapid assessment in a timely manner to ensure that the health care facility can continue to provide critical services to the affected population during and after the disaster. Flexibility and adaptability are key to responding to the evolving needs of the health care facility and its patients. It is crucial to adapt the rapid assessment process to the specific context and needs of the affected communities in Laos. Flexibility, collaboration, and a people-centered approach are essential.

SECTION : 3 During Emergency Actions

4. Water Supply

4.1. Identifying and rehabilitating water sources

Identifying and rehabilitating water sources for healthcare facilities during emergencies in Laos is crucial for ensuring the availability of safe and reliable water for patient care, hygiene, and sanitation.

- Conduct an initial assessment of the healthcare facility's water needs and the condition of existing water sources. Identify any damaged or contaminated water sources that require immediate attention.
- Identify alternative water sources such as nearby rivers, streams, or groundwater / storage that can be utilized for the healthcare facility.
- Evaluate the quality and accessibility of these alternate water sources to ensure they meet safety standards. *(not compromising with the national drinking water quality standards (NDWQS)*.
- Conduct regular water quality tests to assess the suitability of the identified water sources for human consumption and medical use. Ensure that water testing is performed by trained professionals using appropriate testing kits frequently.
- Establish temporary emergency water supply systems, such as water tanks, to provide a readily available water source for immediate use in healthcare facilities.
- Ensure that the emergency water supply system is properly maintained and regularly monitored.

4.2. Water treatment and purification

Water treatment and purification during emergencies for health care facilities in Laos is a critical aspect to ensure the provision of safe and clean water, especially during times of crises or natural disasters.

- Implement water treatment and purification methods, such as chlorination, filtration, and UV treatment, to ensure that the water is safe for medical procedures and patient consumption.
- Provide necessary training to healthcare staff on water treatment techniques and maintenance / proper use of water treatment equipment.
- Use portable water testing kits to assess the quality of the available water sources. Test for contaminants such as bacteria, viruses, chemicals, and other pollutants that can pose health risks.
- Some universal purifying methods that can be adapted to are:
    - Boiling Water: Boil water from potentially contaminated sources for at least one minute to kill disease-causing organisms. This is a simple and effective method to make water safe for consumption.
    - Chlorination: Use chlorine or chlorine tablets to disinfect water. Follow recommended dosages and contact times to ensure effective disinfection without compromising health standards.
    - Filtration and Purification: Utilize portable water filters and purifiers capable of removing bacteria, viruses, and other impurities. Look for filters that meet international standards for water purification during emergencies.

4.3. Water quality monitoring

Monitoring water quality in healthcare facilities during emergencies is crucial for ensuring the safety and health of patients and healthcare workers. In the context of Laos, a country prone to natural disasters and emergencies, maintaining clean and safe water in healthcare facilities becomes even more critical.

- Develop a comprehensive water quality management plan for healthcare facilities in collaboration with local authorities, international organizations, and relevant stakeholders.
- Conduct training programs for healthcare staff on water quality management and emergency response protocols.
- Conduct a thorough assessment of water sources and quality parameters in healthcare facilities before emergencies. Identify potential sources of contamination and vulnerabilities in the water supply system.
- Deploy water quality monitoring systems equipped with sensors and real-time data transmission capabilities in healthcare facilities. Including bottled water practiced throughout the nation for drinking water purpose.
- Regularly monitor key water quality parameters such as pH levels, turbidity, microbial contamination, and the presence of heavy metals.
- Develop a rapid response plan for water quality emergencies, including contamination incidents and natural disasters.
- Implement immediate measures such as water chlorination, filtration, or alternative water supply arrangements in case of water source contamination.
- Analyze water quality data to identify trends, potential risks, and areas for improvement.
- Generate periodic reports on water quality status, challenges, and recommendations for policy and infrastructure improvements.
- Conduct awareness campaigns to educate the local community about the importance of clean water and its impact on healthcare facilities during emergencies.
- Collaborate with local communities to establish sustainable water management practices and build resilience to future emergencies.
- Regularly review and update water quality management plans based on lessons learned from past emergencies and emerging best practices in the field. Also refer to the Water Safety Plans if local schemes had previously been prepared connecting to HCFs.

It is essential to customize this framework according to the specific requirements and challenges faced by healthcare facilities in Laos during emergencies.

4.4. Distribution and storage of potable water

Laos, like many other countries, faces challenges in ensuring the distribution and storage of potable water, especially during emergencies. Health care facilities require a reliable supply of clean water to maintain hygiene standards, conduct medical procedures, and provide appropriate care to patients. During emergencies, such as natural disasters or public health crises, the demand for water can increase significantly, making it crucial for health care facilities to have robust plans in place for the distribution and storage of potable water.

- Health care facilities should have adequate water storage facilities, such as large tanks or reservoirs, to store enough potable water to meet the needs of patients and staff during emergencies. These storage facilities should be regularly inspected and maintained to prevent contamination and ensure water quality.

- Implementing water treatment systems, such as filtration and purification technologies, can help ensure that the water supply remains safe for consumption during emergencies. These systems should be regularly monitored and serviced to guarantee their proper functioning.
- Reliable backup power generators should be available to ensure that water distribution systems, including pumps and treatment facilities, continue to operate during power outages or disruptions.
- Identify and secure reliable water sources for healthcare facilities. This may include on-site wells, water tanks, or connections to municipal water supplies.
- Maintain an emergency supply of bottled water or water purification equipment, storage and distribution tanks in case the facility's primary water source becomes compromised.
- Comply with national and international regulations and guidelines for emergency water supply in healthcare facilities.

5. Sanitation and Hygiene

Poor sanitation facilities in healthcare facilities during emergencies can have significant consequences, leading to various health risks and exacerbating the impact of the emergency. In Laos, where the population is vulnerable to natural disasters, disease outbreaks, and other emergencies, the consequences of inadequate sanitation can be particularly severe. Mainly focusing on:

- Inadequate sanitation facilities, leading to potential outbreaks and an increased burden on the healthcare system.
- Poor sanitation lead to secondary infections, complicating the treatment of patients in healthcare facilities.
- In emergency situations, the absence of adequate sanitation facilities can contribute to a rise in mortality rates.
- Multi disaster / outbreak due to poor sanitation and hygiene
- A lack of privacy, dignity, and hygiene can contribute to a sense of hopelessness and distress, affecting the mental well-being of both patients and healthcare providers.

5.1. Construction and maintenance of emergency latrines and bathing facilities

Ensuring access to proper sanitation and hygiene facilities in healthcare settings is essential to prevent the spread of diseases and maintain the dignity and well-being of patients, staff, and the community.

- Develop a detailed plan for the construction and maintenance of existing and temporary latrines and bathing facilities, considering the number of patients, staff, and expected duration of the emergency.
- Select appropriate locations for temporary latrines and bathing facilities, ensuring they are accessible to patients and staff. Design is to be gender-sensitive, including separate facilities for men and women, and consider the needs of people with disabilities.
- Construct temporary latrines that are safe and sanitary, using locally available materials when possible. Ensure proper ventilation to reduce odors and promote hygiene. Provide handwashing stations with soap and water near latrines.
- Construct separate shower areas for men and women. Ensure adequate privacy for patients during bathing. Maintain a regular supply of clean water for bathing.
- Abide, both the temporary latrines and bathing spaces with SPHERE standards
- Temporary constructions for emergencies should investigate the total chain of sanitation services that do not trigger another public health hazards and environmental hazards.
- Temporary constructions are also to be aligned with decommissioning plan once the emergency caseloads are reduced.
- Implement a waste management system to safely dispose of human waste without causing any adverse effect on public health and environment.

5.2. Promotion of safe hygiene practices (Hand Washing and Menstrual Health and Hygiene)

- In case of promotion of safe hygiene practices two key components are to be considered primely
    - Hand Washing behavior and facilities
    - Menstrual Health and Hygiene (MHH)
- Hand Washing Promotion: Install handwashing stations with soap and water at key locations within the healthcare facilities. Promote the "5 Moments for Hand Hygiene" as

recommended by the World Health Organization (WHO) for healthcare workers. Develop posters, leaflets, and other educational materials to encourage proper handwashing techniques and display them prominently in healthcare facilities.

- Menstrual Health and Hygiene Promotion: Ensure that essential menstrual hygiene supplies, such as sanitary pads, its disposal and safe changing space are available in healthcare facilities. Train healthcare workers to provide information on menstrual hygiene and distribute menstrual hygiene kits to female patients. Create a safe and private space for women and girls to manage their menstrual hygiene needs, including changing and disposal facilities.

5.3. Solid waste management in emergency settings

Solid waste management in emergency settings in healthcare facilities is of paramount importance for preventing the spread of diseases and maintaining a hygienic environment, particularly in Laos, where healthcare infrastructure might face challenges during emergencies.

- Implement a waste segregation system to separate infectious, hazardous, and non-hazardous waste. Color-coded bins and clear signage can help staff members differentiate between diverse types of waste. Ensure it accounts for several types of emergencies and their potential impact on solid waste management of HCFs. All waste containers should be properly labeled to indicate the type of waste and any associated hazards. This is crucial for the safety of waste handlers.
- Designate specific areas within the healthcare facility for the temporary storage of waste. These areas should be secure and away from patient care areas to prevent contamination.
- Utilize appropriate disposal methods for diverse types of waste. Incineration can be considered for hazardous and infectious waste, while recycling and landfill disposal can be options for non-hazardous waste. Ensure that the chosen disposal methods comply with environmental regulations and guidelines developed by Lao government.
- Ensure that healthcare workers have access to appropriate PPE, including gloves, masks, and gowns, to protect themselves from potential exposure to hazardous waste during collection and disposal. And its adequate disposal once used.
- Establish a regular waste collection schedule to prevent the accumulation of waste within the healthcare facility. This will help maintain a clean and safe environment for patients, staff, and visitors. Keeping in mind that the collected waste is disposed adequately and not just shifting the location.
- Identify and designate appropriate disposal sites for diverse types of waste, adhering to local regulations and environmental standards. Coordinate with local authorities and waste management agencies to ensure proper disposal of hazardous waste, especially during emergencies.
- Be aware of and adhere to the local regulations regarding healthcare waste management. The Ministry of Health and other relevant authorities are required to take the nodal role in this waste management.

6. Health and Hygiene Promotion

- Implement strict IPC (Infection Prevention and Control) measures, including proper hand hygiene, use of personal protective equipment (PPE), and adherence to universal precautions. Ensure that healthcare workers receive regular training on IPC protocols and that these measures are strictly enforced during emergencies.

- Conduct health education programs for both patients and healthcare workers, emphasizing the importance of maintaining personal hygiene, proper waste disposal, and other preventive measures. Utilize various communication channels, including posters, leaflets, and educational sessions, to disseminate essential health and hygiene information.
- Provide psychosocial support for both patients and healthcare workers during emergencies. Offer counseling services and mental health support to help individuals cope with the stress and trauma associated with emergencies.
- Some of the key activities for community consultation for awareness on Health, Hygiene and Safety are: i. Household visit by community volunteers ii. Miking with messages iii. Billboards and flex with messages in key gathering locations iv. Consultation booths at HCFs for queries v. mobilizing key community leaders for the precise messages vi. Mass gatherings with clear messages

6.1. Community engagement and mobilization

- Set up local committees comprising community leaders, health workers, and volunteers. These committees can act as intermediaries between health care facilities and the community during emergencies.
- Train local community health workers in basic health and hygiene practices. Provide them with the necessary information and resources to disseminate among community members, focusing on essential topics like proper sanitation, disease prevention, and first aid.
- Develop communication strategies that consider local cultural beliefs, practices, and language preferences. Use culturally appropriate methods such as community meetings, local media, and interpersonal communication to convey health and hygiene messages effectively.
- Organize regular workshops, seminars, and awareness campaigns on the importance of maintaining personal hygiene and sanitation. Highlight the direct link between good hygiene practices and disease prevention, particularly during emergencies.
- Forge partnerships with local leaders, non-governmental organizations (NGOs), and community-based organizations to enhance community engagement and mobilization efforts. Leverage their networks and resources to reach a wider audience and ensure the sustainability of health promotion activities.
- Incorporate traditional health practices and beliefs into health promotion initiatives, ensuring that they complement modern health care practices. This integration can help build trust and acceptance among community members, leading to better engagement and participation.
- Utilize technology, such as mobile applications and social media platforms, to disseminate health-related information and updates quickly. This approach can help in reaching a larger population, especially the younger demographic, and in providing real-time guidance during emergencies.

By implementing these strategies, a resilient community is well-equipped to respond to health emergencies and prioritize health and hygiene promotion within health care facilities.

6.2. Conducting hygiene awareness campaigns

- Create engaging and informative campaign materials that are culturally sensitive and easy to understand. These could include posters, brochures, and infographics illustrating proper hygiene practices during emergencies.

- Develop clear and culturally sensitive messages focusing on key hygiene practices, such as handwashing, safe water storage, and sanitation. Translate materials into local languages, if necessary.
- Train healthcare facility staff and community health workers to disseminate hygiene information effectively.
- Establish community-based teams to reach remote areas and underserved populations. Create hygiene committees within communities to sustain hygiene awareness efforts. Establish a crisis communication team to provide accurate and timely information to the public.
- Use various communication channels such as radio, TV, social media, community meetings, and local leaders to disseminate hygiene information.
- Develop simple, visual materials like posters, pamphlets, and videos for easy understanding.
- Address the psychological impact of emergencies by offering psychosocial support and counseling.

6.3. Distribution of hygiene kits (Hygiene / Dignity kit)

Technical specifications:
Immediate Response WASH Hygiene & Dignity kit sufficient for the needs of one family/Household - for early response in emergencies. The kit is designed for a family of five; including two adults and three children/adolescents; for emergency situations for a period of one month.

Kit contents:
(Quantity x Item description)

- **2 x Water container, 10l, collapsible, w/o logo**
- **1 x Bucket, with lid and tap, 14l.**
- **Water Purification Tablets or solutions sufficient for 30 days**
- **12 x Soap, toilet, bar, approx.110g, wrapped.**
- **1 x Torch, handheld, self- powered**
- **1 x Child potty**
- **2 x Multipurpose Cloth, cotton, 1x1.5m**
- **1 x Reusable menstrual set**
- **1 x Sanitary pads, female, w/wings, disposables, set.**
- **1 x Whistle, for safety use, metal**
- **1 x Underwear, female panties, qty 3x3 (S, M, L) set**
- **1 x laundry detergent, 1.5kg**
- **1 x Leaflet on WASH & Dignity Kit**

Initial distribution to new beneficiaries might require explanation of contents, their use, and associated benefits.

- Form a team comprising healthcare professionals, logistics experts, and local authorities to oversee the distribution process.
- Develop a detailed distribution plan outlining the target areas, the number of kits required, and the logistics involved.
- Compile a list of essential items for the hygiene kits, including soap, hand sanitizers, masks, disinfectants, and other relevant items.
- Partner with local suppliers to ensure a sufficient stock of hygiene products.
- Assemble the kits in advance, considering the specific requirements of different demographic groups, such as children, elderly individuals, and people with disabilities.
- Identify secure distribution points in the affected areas, such as local health centers, community centers, or schools, where people can easily access the hygiene kits.
- Arrange for reliable transportation to deliver the hygiene kits to these distribution points.
- Implement a fair and transparent distribution system that prioritizes the most vulnerable groups, including pregnant women, children, and the elderly.

- Train volunteers and local staff to manage the distribution process efficiently and with sensitivity to the needs of the affected individuals.

6.4. Promoting safe food handling and nutrition

Given the potential for foodborne illnesses and the increased vulnerability of individuals during emergencies, it is essential to implement comprehensive strategies that prioritize both safety and nutrition.

- Conduct training programs and workshops for healthcare staff on safe food management practices, including proper hygiene, sanitation, and the prevention of cross-contamination. Include specific modules on emergency response protocols.
- Develop and enforce standardized protocols for food preparation, storage, and distribution within healthcare facilities, considering the unique challenges and constraints faced during emergencies.
- Provide nutrition education to patients and their families, emphasizing the significance of a balanced diet during recovery and the management of chronic conditions. Develop customized dietary plans that accommodate the needs of individuals with specific dietary requirements.
- Provide nutrition education to patients and their families, emphasizing the significance of a balanced diet during recovery and the management of chronic conditions. Develop customized dietary plans that accommodate the needs of individuals with specific dietary requirements.
- Conduct regular audits and inspections to ensure that healthcare facilities comply with food safety regulations and standards. Address any issues promptly and transparently to maintain public trust and confidence.

Health care facilities can effectively promote safe food handling and nutrition during emergencies, thereby safeguarding the health and well-being of the population, especially during times of crisis.

7. Health and Safety

Specific protocols may vary based on the type and scale of the emergency.

- Establish clear evacuation procedures, including designated evacuation routes and assembly points, to ensure the safe and timely evacuation of patients, staff, and visitors in the event of an emergency.
- implement an effective communication plan that includes communication systems within the healthcare facility as well as communication channels with local authorities, emergency response agencies, and other relevant stakeholders.
- Train healthcare staff to handle medical emergencies effectively, including providing immediate medical care to patients, triaging patients based on the severity of their condition, and coordinating with external emergency medical services when necessary.
- Implement security protocols to safeguard the healthcare facility and its occupants during emergencies. This may include controlling access to the facility, securing critical infrastructure, and ensuring the safety of patients and staff from potential security threats.
- Develop a continuity of care plan to ensure that essential healthcare services can be maintained during and after an emergency. This may involve establishing temporary healthcare facilities, prioritizing critical services, and ensuring the uninterrupted supply of medications and medical supplies.

7.1. Disease Surveillance and Outbreak Response

- Setting up robust disease surveillance systems at health care facilities is crucial. This includes training healthcare workers to recognize and report symptoms of potential outbreaks, ensuring the availability of necessary diagnostic tools, and establishing efficient communication channels between different healthcare facilities and the central health authorities.
- Creating rapid response teams that are well-trained and equipped to handle emergency situations can significantly improve outbreak response. These teams should be capable of deploying quickly to affected areas, assessing the situation, and implementing control measures promptly.
- Effective data management and reporting systems are necessary to collect, analyze, and share information about diseases. This is crucial for tracking and responding to outbreaks.
- Maintaining stockpiles of essential medical supplies and equipment is important to respond to disease outbreaks. These stockpiles should be regularly updated and maintained.
- Adequate laboratory facilities for testing and diagnosing diseases are critical during outbreaks. Laos should have the capacity to rapidly confirm cases and identify the causative agent.
- Isolation and quarantine facilities are essential to separate and treat infected individuals during an outbreak.
- Healthcare facilities should be equipped to provide vaccination and treatment to affected individuals.
- Assure a legal framework in place that allows for swift and effective response during emergencies is crucial. This should include measures for enforcing isolation and quarantine, as well as facilitating international assistance if necessary.

7.2. Environmental Health

In managing environmental health in healthcare facilities during emergencies, several key areas should be addressed:

- Ensure a safe and sufficient water supply, proper waste management, and adequate sanitation facilities. Contaminated water and poor sanitation can lead to the spread of infectious diseases, which can exacerbate the emergency. And the requirement to be taken into account that the wastewater and human waste is adequately treated, reused without imposing adverse effects to the public health and environmental health.
- Effectively manage all types of waste generated within the healthcare facility, including medical, hazardous, and general waste. Segregate, handle, and dispose of waste according to established guidelines to minimize environmental and health risks.
- Establish proper protocols for the disposal of healthcare waste, including hazardous materials and biohazardous waste. Ensure that all waste disposal methods comply with national and international guidelines and regulations.
- Implement measures to control vectors such as mosquitoes, flies, and rodents. This includes regular cleaning, elimination of breeding sites, and use of appropriate insecticides or pesticides, all of which are important for preventing the spread of vector-borne diseases.
- Regularly maintain and repair the infrastructure and facilities to ensure a safe and healthy environment for patients, healthcare workers, and visitors. This includes proper ventilation, electrical safety, and structural integrity checks.

7.3. Safety Protocols for WASH Personnel

Developing safety protocols for WASH (Water, Sanitation, and Hygiene) personnel during emergencies in healthcare facilities is crucial in ensuring the well-being of both the personnel and the community they serve.

- Provide comprehensive training to WASH personnel on emergency response protocols, including first aid, evacuation procedures, and handling hazardous materials. Also, on monitoring and reporting the WASH situation and alert management on timely basis for actions.
- Ensure that WASH personnel have access to and are trained in the proper use of personal protective equipment, including gloves, masks, and boots, especially when dealing with contaminated water or waste.
- Provide appropriate PPE, including gloves, masks, goggles, and protective clothing, to WASH personnel. Ensure they know how to use and dispose of PPE properly.
- Implement strict infection control measures, including hand hygiene, to prevent the spread of infectious diseases in emergency situations.
- Address security concerns by collaborating with local authorities or security personnel to ensure the safety of WASH staff and the healthcare facility. Assuring all personnels are within the safety net in case of emergencies.
- Recognize the psychological stress that WASH personnel may experience during emergencies and provide access to mental health support and counseling.
- Ensure compliance with local regulations and guidelines for Health Care WASH personnel during the emergency response in healthcare facilities.

8. Gender and inclusivity

Gender and inclusivity within healthcare facilities during emergencies are crucial aspects that should be carefully considered. Specific attention should be paid to cultural norms, social dynamics, and the existing healthcare infrastructure to ensure that emergency responses are inclusive and sensitive to gender-specific needs. Consider different vulnerabilities, risks, and social roles of men and women in society. Inclusivity for vulnerable population is to be addressed.

- Persons with Disabilities: Healthcare facilities should be accessible to people with disabilities, both in terms of physical infrastructure and provision of information. Ensure there are adequate support systems in place.
- Elderly and children Population: Consider the unique needs of elderly individuals and children, including access to medications, mobility aids, and geriatric care.
- LGBTQ+ Community: Be aware of the potential stigma and discrimination that LGBTQ+ individuals may face in healthcare settings and work to create a safe and inclusive environment.

8.1. Considerations for Women and Vulnerable Groups

- Establishing gender-sensitive healthcare facilities that accommodate the specific needs of women, such as separate sanitation facilities, privacy for consultations, and safe spaces for breastfeeding and childcare, is essential.
- Ensuring that healthcare facilities have enough trained healthcare providers, including female staff members, who are equipped to handle the medical and emotional needs of women and vulnerable groups during emergencies.
- Providing accessible transportation to healthcare facilities for pregnant women, elderly individuals, and people with disabilities to ensure that they can access timely and appropriate medical care during emergencies.
- Implementing security measures, such as well-lit pathways and security personnel, to ensure the safety of women and vulnerable groups from potential risks of violence and exploitation in healthcare facilities during emergencies.
- Ensuring access to reproductive health services, including maternal healthcare, family planning, and access to menstrual hygiene products, to safeguard the health and well-being of women and girls during emergencies.
- Collecting sex-disaggregated data and monitoring the specific health needs and outcomes of women and vulnerable groups during emergencies to assess the effectiveness of interventions and to inform future planning and policy development.
- Ensuring that women and vulnerable groups have access to legal protection and support services, including information about their rights, to prevent and address any potential cases of discrimination, violence, or exploitation in healthcare facilities during emergencies.

8.2. Addressing Gender-Based Violence

- Create safe spaces within health care facilities where survivors of GBV can access medical, psychosocial, and legal support in a secure and confidential environment.
- Collaborate with legal organizations to provide survivors of GBV with access to legal support, including information about their rights and options for seeking justice.

- Develop and implement clear policies and protocols within health care facilities that address the prevention of and response to GBV, ensuring that they are in line with international standards and human rights principles.
- Offer comprehensive psychosocial support services for survivors of GBV, including counseling and mental health services, to address the trauma and emotional distress associated with such experiences.
- Establish a robust system for collecting data on GBV cases within health care facilities to better understand the scope of the issue and inform evidence-based interventions.
- Establish coordination mechanisms between healthcare facilities, law enforcement, and local organizations providing GBV support services. Ensure smooth referral pathways for survivors.

8.3. Ensuring Inclusivity

- Ensure that healthcare facilities are designed and equipped to be accessible to individuals with disabilities. This includes ramps, elevators, accessible bathrooms, and appropriate signage.
- Train healthcare providers to be sensitive to the cultural and religious backgrounds of patients. Understanding cultural norms and values can help build trust and improve communication between healthcare providers and patients.
- Provide interpretation services and translated materials to ensure that individuals who do not speak the dominant language can effectively communicate their needs and concerns to healthcare providers.
- Implement targeted outreach programs to reach vulnerable populations, such as rural communities, ethnic minorities, and individuals with limited access to healthcare services, to ensure that they receive necessary information and support during emergencies.
- Develop policies that explicitly address inclusivity in emergency response planning, ensuring that the needs of all individuals, regardless of their background or status, are considered and accommodated.
- Develop and implement emergency protocols that are inclusive and consider the specific needs of diverse populations. This can include provisions for medical equipment, transportation, and communication methods that cater to a wide range of individuals.

9. Monitoring and Evaluation

A monitoring and evaluation framework that outlines the key indicators, data collection methods, responsible agencies, and reporting mechanisms is essential. This framework should be specific to healthcare facilities and its WASH services and tailored to the nature of the emergency (e.g., natural disasters, disease outbreaks). A baseline assessment of the WASH services in healthcare facilities as mentioned earlier as well is required. This should include an inventory of existing infrastructure, water sources, sanitation facilities, hygiene practices, and staffing. Define KPIs that reflect the critical aspects of WASH services in healthcare facilities. These may include i. Availability and accessibility of clean water supply. ii. Functionality of sanitation facilities and waste management. iii. Hygiene and infection control practices. iv. Adequacy of healthcare staff trained in WASH. v. Compliance with national and international standards.

9.1. Establishing monitoring indicators

a. Water Supply

- Indicator 1: Availability of clean water per person per day (in liters). *20 liters per capita per day is the minimum quantity of safe water required to realize minimum essential levels for health and hygiene*
- Indicator 2: Percentage of functioning water sources in HCFs.
- Indicator 3: Frequency of water quality testing and compliance with national standards.
- Indicator 4: Consistency of water supply (24/7 vs. intermittent supply).

b. Sanitation Facilities

- Indicator 1: Adequate number of functional toilets and handwashing stations per patient and staff.
- Indicator 2: Access to gender-segregated and accessible sanitation facilities.
- Indicator 3: Regular maintenance and cleanliness of sanitation facilities.
- Indicator 4: Management & disposal of Human excreta and wastewater
- Indicator 5: Solid waste and Health Care waste management & disposal

c. Hygiene Promotion:

- Indicator 1: Frequency and reach of hygiene promotion campaigns in HCFs.
- Indicator 2: Availability of handwashing stations with soap or alcohol-based hand rubs.
- Indicator 3: Adherence to proper waste management protocols within HCFs.
- Indicator 4: Menstrual Hygiene Management and its provisions (sanitary pads and changing space)

d. Infection Prevention and Control (IPC):

- Indicator 1: Implementation of standard IPC protocols within HCFs.
- Indicator 2: Regular availability of personal protective equipment (PPE) for healthcare workers.
- Indicator 3: Compliance with waste management guidelines to prevent contamination.
- Indicator 4: Healthcare-associated infections (HAIs) and their rates.

e. Healthcare Waste Management:

- Indicator 1: Existence of a waste management plan for HCFs during emergencies.
- Indicator 2: Compliance with safe disposal practices for infectious waste.

- Indicator 3: Frequency of waste collection and safe disposal services.

9.2. Data collection and reporting

- Establish "Data Collection Protocols" with standardized forms and tools for data collection, ensuring they are easily understandable and accessible to all health care staff.
- Regular training sessions for healthcare staff on data collection protocols, emphasizing the importance of accurate and timely data recording during emergencies. This is for guidance on how to use data collection tools and ensure that all staff members are proficient in using them.
- Implement Real-Time Data Collection Systems enabling quick transmission of critical information from the field to the central monitoring system. The data collection systems are user-friendly and compatible with the existing infrastructure in health care facilities.
- Establish a Centralized Reporting System that consolidates data from various health care facilities across all seventeen provinces of Laos with dedicated personnel to manage the reporting system and ensure timely and accurate data aggregation from different sources.
- Conduct regular data analysis to identify trends, patterns, and gaps in the provision of healthcare services during emergencies. Interpret the data to generate actionable insights and inform decision-making processes at both local and national levels.
- Implement robust data security measures to safeguard the confidentiality and integrity of sensitive healthcare data. Comply with international data protection standards and regulations to protect the privacy of patients and healthcare personnel.
- Establish mechanisms for collecting feedback and authenticating at the sub-national levels from healthcare staff and stakeholders to assess the effectiveness of the data collection and reporting system.

9.3. Regular assessment of the effectiveness of WASH interventions

- Utilize standardized indicators recommended by global health and WASH organizations, such as the World Health Organization (WHO) and UNICEF, to measure the effectiveness of WASH interventions.
- A clear framework for assessing WASH interventions that include the objectives of the assessment, key performance indicators, data collection methods, and a timeline for regular assessments with various type of emergencies into consideration. Define specific metrics and indicators to measure the effectiveness of WASH interventions in HCFs during emergencies.
- Quality Assurance and Compliance that adhere to established guidelines and protocols to guarantee the quality and sustainability of the HCFs WASH services.
- Remain flexible and adaptive to evolving needs and challenges during emergencies. Regularly update and modify the WASH interventions based on the assessment findings and changing circumstances.
- Data Collection and Analysis with i. field visits ii. Interviews and Rapid surveys iii. Information / Data analysis. Ensure data accuracy and reliability through validation processes.

9.4. Feedback mechanisms for continuous improvement

- Establish a comprehensive M&E system to track the performance of WASH services in HCFs. This system should include regular assessments of water quality, sanitation facilities, and hygiene practices, as well as the overall functionality of the infrastructure.

- Engage local communities, health workers, and relevant stakeholders in the planning and implementation of WASH services. Encourage regular consultations to gather feedback on the current services and to identify areas for improvement.
- Set up community-based feedback / grievances response mechanisms, such as suggestion boxes, community meetings, or hotlines, to allow community members to report issues, share concerns, and provide suggestions for improving WASH services in HCFs.
- Conduct periodic performance reviews to assess the effectiveness of WASH interventions in HCFs. Develop action plans based on the feedback received during these reviews to address any shortcomings and to ensure continuous improvement.
- Launch public awareness campaigns to educate the local population about the importance of WASH practices in HCFs during emergencies. Gather feedback from these campaigns to understand their impact and to refine the messaging for maximum effectiveness.
- Integrate technological solutions, such as mobile applications or digital platforms, to streamline data collection, reporting, and monitoring processes. Utilize these platforms to gather feedback from both the community and healthcare workers in real-time.
- Regularly review existing policies and guidelines related to WASH services in HCFs during emergencies. Solicit feedback from key stakeholders to identify areas where policy adaptation or revision is necessary for the effective delivery of services.
- Encourage healthcare workers to report issues and make suggestions for improvement. They are on the front lines and can offer valuable insights.
- Establish quality assurance teams responsible for regularly inspecting and evaluating WASH services. Their findings should be used to drive improvements.

10. Coordination with Other Sectors

Government bodies multi sectoral coordination mechanism is to be established both vertical and horizontal to cross collaborate and avoid duplication during emergencies. Ministry of Health as the nodal ministry for the services of WASH in HCFS are to institutionalize the inter-sectoral collaboration with Ministry of labor and social affairs, Ministry of Public Works and Transport, and Ministry of Natural Resources and Environment to facilitate policy implementation and resource allocation, and collective attributions for emergency WASH services in HCFs. As WASH cannot be standalone component of the overarching emergencies responses, this coordination will build the integrated approach to fill the gaps for immediate relief to the affected population.

10.1. Collaboration with health, nutrition, and shelter sectors

- Create a task force or committee / coordination committee comprising representatives from the health, nutrition, and shelter sectors, along with relevant government authorities and non-governmental organizations (NGOs). This committee can serve as a platform for regular communication, coordination, and joint decision-making.
- Conduct joint assessments to identify the specific needs and challenges in providing WASH services in HCFs during emergencies. Share data and information among the sectors to facilitate a comprehensive understanding of the situation and to guide effective decision-making.
- Pool together resources, including financial, technical, and human resources, to support the implementation of WASH services in HCFs. Utilize the expertise and knowledge from each sector to develop innovative solutions and best practices tailored to the specific context of emergencies.
- Advocate for the integration of WASH services in HCFs within national policies and guidelines. Collaborate with policymakers to develop comprehensive policies that prioritize WASH services in HCFs during emergencies and ensure their sustainable implementation.
- Ensure that the government takes a lead role in coordinating in any circumstances so that the response efforts and facilitating collaboration among the sectors along with humanitarian support agencies.

10.2. Cross-sectoral coordination mechanisms

- Form a committee or coordination forum consisting of led by representatives from the Ministry of Health and participated by Ministry of Water Resources, relevant NGOs, humanitarian agencies, and other stakeholders to oversee the emergency response activities and ensure a coordinated approach to WASH services in HCFs.
- MoH is responsible for healthcare facilities and services. MoH works closely with the NDMA to ensure that WASH services are integrated into healthcare facility planning and emergency response plans.
- The WASH Cluster is a coordination mechanism used in humanitarian response. It brings together government agencies, NGOs, UN agencies, and other stakeholders involved in WASH services. In Laos, this cluster would focus on healthcare facilities during emergencies.
- Local governments and authorities at the provincial and district levels are crucial for ensuring that WASH services reach healthcare facilities at the community level. They coordinate with central authorities and facilitate the delivery of services.
- Foster partnerships with international aid organizations such as UNICEF, WHO, and other relevant NGOs to leverage their expertise and resources in addressing WASH challenges

during emergencies. Establish clear lines of communication and roles for each organization to prevent duplication of efforts.

10.3. Information sharing and joint planning.

- Create a centralized digital platform where relevant stakeholders can securely share and access critical information on WASH services in HCFs during emergencies. This platform can be used for real-time data sharing, updates on resource availability, and emergency response coordination.
- Standardize data collection protocols for WASH services in HCFs during emergencies. This ensures that all stakeholders collect and share data uniformly, facilitating accurate and comprehensive analysis for effective decision-making.
- Utilize Geographic Information System (GIS) mapping technology to identify vulnerable areas and map the locations of healthcare facilities. This aids in efficient resource allocation and targeted emergency response planning.
- Organize regular interagency coordination meetings involving government authorities, NGOs, and relevant stakeholders. These meetings should focus on information sharing, joint planning, and the establishment of clear roles and responsibilities during emergencies.
- Deploy a secure communication system, such as encrypted messaging platforms or dedicated emergency communication channels, to ensure the confidentiality of sensitive information shared among stakeholders.
- Define clear protocols and channels for sharing WASH-related information. This should include regular reporting, updates on WASH conditions in HCFs, and the status of available resources.

11. Exit Strategy and Recovery

The HCFs response strategy is to be categorized in three phases i. Preparedness phase ii. Immediate response phase and iii. Rehabilitation and reconstruction phase. There should be a dedicated benchmark when to exit the immediate response and move towards the recovery phase though challenging to demark the line.

11.1. Developing an exit strategy

- Develop a clear exit strategy that includes transitioning from emergency response to routine WASH services.
- Define clear drivers that indicate the need to shift from emergency response to recovery and development phases, such as when immediate life-threatening conditions have stabilized.
- Hand over responsibilities to the healthcare facilities and local authorities, ensuring they can maintain and manage WASH services independently.
- Define specific exit criteria that must be met for the exit strategy to be implemented, such as when healthcare facilities can independently manage their WASH services for regular operations.
- Plan for a phased withdrawal of external support, gradually reducing assistance as healthcare facilities become self-reliant.
- Regularly review and update the exit strategy based on evolving circumstances, lessons learned, and changes in healthcare facility capacities.

11.2. Transitioning from emergency response to recovery and development

- This phase requires focus on rehabilitating the damaged WASH infrastructure and the institutional set up for continued services from HCFs.
- Lessons of immediate responses to be incorporated during the recovery phase to build on the lessons prepared for future emergencies in various scenarios.
- Multi sectoral review for the lessons on the immediate phase response and preparedness phase to build on it.

11.3. Ensuring sustainability of WASH services

The key 11 parameters to ensure the sustainable WASH services in HCFs during emergencies are:

- Comprehensive WASH preparedness plans that outline clear procedures for maintaining essential services during emergencies. Healthcare staff are well-prepared to manage WASH facilities during crises.
- Integrated WASH infrastructure that can withstand the impact of natural disasters and emergencies. Ensure that water sources, sanitation facilities, and hygiene promotion initiatives are designed and built to meet the specific needs of HCFs and the surrounding communities.
- Robust water quality monitoring system to regularly test and ensure the safety of water sources within HCFs. Implement appropriate water treatment methods to remove contaminants and prevent waterborne diseases.
- Hygiene promotion campaigns to educate healthcare staff, patients, and the local community about the importance of proper hygiene practices. Promote behavior change through interactive workshops, educational materials, and community engagement activities.
- Sustainable sanitation solutions that are appropriate for the local context, considering cultural preferences and environmental sustainability. Promote the use of eco-friendly and cost-effective sanitation technologies that are easy to maintain and operate.
- Community participation in the planning, implementation, and maintenance of WASH services in HCFs. Encourage community members to take ownership of WASH facilities and actively participate in decision-making processes related to WASH service provision.
- Training and capacity-building programs for healthcare staff on WASH service management, maintenance, and infection prevention and control. Equip staff with the necessary skills and knowledge to respond effectively to WASH-related emergencies.
- Institutional capacity at the local and national levels to support sustainable WASH service delivery in HCFs during emergencies. Foster collaboration between relevant government agencies, NGOs, and other stakeholders to promote effective coordination and resource allocation.
- Innovative financing mechanisms, such as public-private partnerships and community-based financing models, ensure sustainable funding for WASH services in HCFs.
- Advocate for the allocation of adequate financial resources for the maintenance and operation of WASH infrastructure during and after emergencies.
- Comprehensive monitoring and evaluation framework to assess the effectiveness and impact of sustainable WASH interventions in HCFs. Use the data collected to identify best practices, lessons learned, and areas for improvement, and incorporate these findings into future emergency preparedness and response plans aligned to the KPIs.

12. Documentation and Reporting

Establish a Comprehensive Documentation Plan outlining the specific WASH services to be documented and reported during emergencies. Identify key personnel responsible for data collection, documentation, and reporting within each healthcare facility. Use of digital tools and technologies for data collection, analysis, and reporting. Consider the use of mobile applications or software solutions to streamline the documentation and reporting process.

12.1. Keeping records of all activities

- Develop a standardized recording system that includes key parameters such as the date, location, type of emergency, nature of WASH services provided, and the number of beneficiaries and caseloads.
- Maintain a log to record all activities related to WASH services. This should include information on water supply, sanitation facilities, hygiene promotion campaigns, and any repairs or maintenance conducted during emergencies.
- Track the usage of WASH facilities and services within HCFs. Document the impact on public health, such as reduced cases of waterborne diseases or improved hygiene practices among patients and staff.
- Implement data security measures to protect sensitive information. Adhere to data protection laws and ensure that only authorized personnel have access to the records.
- Generate regular reports detailing the WASH activities conducted in HCFs during emergencies. Include the challenges faced, successes achieved, and recommendations for improvement. Share these reports with relevant stakeholders, including government agencies, NGOs, and international organizations.
- Analyze the recorded data to identify trends, challenges, and areas for improvement. Use this analysis to inform future emergency preparedness plans and to advocate for increased support for WASH services in HCFs.
- Provide training to staff responsible for record-keeping to ensure accurate and consistent data collection. Promote a culture of data-driven decision-making within the organization.
- Ensure that the recorded data aligns with the national WASH information systems. This integration will facilitate coordination with government authorities and enable better resource allocation during emergencies.

12.2. Reporting to relevant authorities and donors

- Create a standardized reporting system that captures key data points related to WASH services in HCFs during emergencies. This system should be accessible and user-friendly for all staff involved in data collection.
- Determine the relevant authorities and donors involved in WASH services in HCFs during emergencies. This might include government agencies, local NGOs, international organizations, and donor institutions.
- Prepare regular reports on the status of WASH services in HCFs, highlighting any critical issues, successes, and ongoing needs. Reports should be concise, clear, and supported by data and relevant case studies.
- Establish a communication protocol for reporting that specifies the frequency, format, and channels of communication with authorities and donors. Ensure that the reporting process complies with the data protection and confidentiality regulations. Utilize various

communication methods to report information, such as email, phone calls, or online reporting platforms.

- Ensure that all reports are clear, concise, and well-documented. Maintain transparency in reporting, ensuring that all stakeholders have access to relevant information.
- Document your reporting process and the responses received for future reference.
- Leverage technology for data collection, analysis, and reporting. This may include using mobile data collection tools, Geographic Information System (GIS) mapping, and other digital platforms to enhance the efficiency and accuracy of reporting.
- Ensure compliance with regulatory requirements and maintain accountability in reporting to build trust and transparency with stakeholders.

12.3. Lessons learned and best practices.

- Document successful approaches and techniques in WASH services during emergencies in HCFs. Highlight case studies, success stories, and practical examples to illustrate effective practices.
- Analyze the challenges faced during emergencies and extract valuable lessons from these experiences. Include both positive and negative outcomes, along with the strategies adopted to address the challenges.
- A comprehensive report that includes best practices, and lessons learned. Include visual aids such as graphs, charts, and photographs to enhance the report's comprehensibility.
- Dissemination workshops, webinars, or conferences to promote the best practices and lessons learned.

13 Appendices

Annex I: WASH Stock update matrix including MOH and government entities (Sample)
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Annex V: ERT Generic TOR Sample:
Annex VI: Hand Washing Guidance for Health Care (WHO 2023)
Annex VII: Sphere standards for WASH

14. References

List all relevant documents, guidelines, and sources used in developing the STANDARD GUIDELINE.

- Hospital Safety index
- 8th Five-year Health Sector Development Plan (2021 – 2025)
- Lao Health Sector Reform Strategy (2021 – 2030)
- Report on Gaps and Needs on the Emergency Preparedness and Response for WASH By Pamouane Thongpaseuth, Individual Consultant (4 deliverables and workplan)
- Lao PDR WASH National Profile & provincial profile
- LAO PDR NATIONAL CLIMATE CHANGE VULNERABILITY ASSESSMENT – 2017 (UN-Habitat)
- Strategy on Climate Change and Health Adaptation (2018 – 2020)
- Disaster Governance in Lao People Democratic Republic (24 March 2023) & organizational structure for Disaster management
- 2017 MICS Social Indicator Survey II

- Global WASH standards for HCFs (WHO)
- Sphere standards

15. Review and Revision

Specify a regular review and revision schedule for the STANDARD GUIDELINE to ensure it remains up-to-date and reflects the evolving context in Lao PDR.

NOTE: This STANDARD GUIDELINE should be tailored to the specific needs and conditions in Lao PDR, and it should be regularly tested and updated through drills and real-life emergency responses to ensure its effectiveness. Additionally, it should be in line with national and international WASH standards and guidelines.

Annex I: WASH Stock update matrix including MOH and government entities (Sample)

ITEMS	ORG1	ORG2	ORG3	ORG4	ORG5	ORG6	ORG7	ORG8	TOTAL
Amobea ra pani booklet, Nepali 4947 4947									
Aquatab 825 1875269 66250 1942344									
Arsenic test kit,extended range ** 38 38									
Bact.testg,E-Coli-ONLY,Compct Dry Plates 4 4									
Bag, Hygiene kit 5398 5398									
Bag,UNICEF,blue nylon,280x410x170mm 11008 11008									
Bags,Water Sampling,Sterile,Stand,100ml 81 81									
Body-belt, incubation, L 50 50									
Body-belt, incubation, M 25 25									
Body-belt, incubation, XL 25 25									
Bucket 10L 9370 9370									
Bucket 15L 3200 3200									
Chlorination Flex Poster, 2x3 ft, 300gsm 580 580									
Chlorination poster, size A4, 500 sheet 400 400									
Amobea ra pani booklet, Nepali 4947 4947									
Aquatab 825 1875269 66250 1942344									
Arsenic test kit,extended range ** 38 38									
Bact.testg,E-Coli-ONLY,Compct Dry Plates 4 4									
Bag, Hygiene kit 5398 5398									
Bag,UNICEF,blue nylon,280x410x170mm 11008 11008									
Bags,Water Sampling,Sterile,Stand,100ml 81 81									
Body-belt, incubation, L 50 50									
Body-belt, incubation, M 25 25									
Body-belt, incubation, XL 25 25									
Bucket 10L 9370 9370									
Bucket 15L 3200 3200									
Chlorination Flex Poster, 2x3 ft, 300gsm 580 580									
Chlorination poster, size A4, 500 sheet 400 400									
Cholera Prevention poster, size A4,500pag 792 792									
Dignity kit 800 5000 5800									
Flask, thick wall, w/sidearm,250ml,MICS 71 71									
Food hygiene flex poster, 2x3ft, 300gsm 2147 2147									
Water floc. & disinfectant, pdr/BOX-240 3800 3800									
Water pr.unit,skid,5cbm/hr@20mTMH.DIESEL									
WATER PURIF (NADCC) 33MG TAB/PAC-									
WATER TANK T11 -									

Annex II: HCFs WASH Actors Capacity Outline: (Sample)

Agency (National, International, UN)	Capacity (HR, Resource,	Surge Arrangements	Planned Activities	Case load and stockpiles	District presence	Remarks
UNICEF						
WHO						
SNV						
Water Aid						

Annex III: Population to indicate the affected provinces: (Sample)

Location	Province	Capital	Population (2023 census)	Male	Female	# of HCFs
	Attapeu province	Samakkhixay District (Attapeu)	153,000			
	Bokeo province	Houayxay District (Ban Houayxay)	198,000			
	Bolikhamxai province	Pakxan District (Pakxan)	287,000			
	Champasak province	Pakse District (Pakse)	706,000			
	Houaphanh province	Xam Neua District (Xam Neua)	302,000			

Location	Province	Capital	Population (2023 census)	Male	Female	# of HCFs
	Khammouane province	Thakhek District (Thakhek)	397,000			
	Luang Namtha province	Namtha District (Luang Namtha)	182,000			
	Luang Prabang province	Luang Prabang (Luang Prabang)	444,000			
	Oudomxay province	Xay District (Muang Xay)	313,000			
	Phongsaly province	Phongsaly District (Phongsali)	192,000			
	Salavan province	Salavan District (Salavan)	410,000			

Location	Province	Capital	Population (2023 census)	Male	Female	# of HCFs
	Savannakhet province	Khanthaboury District (Savannakhet)	1,004,000			
	Vientiane province	Phonhong District (Phonhong)	435,000			
	Vientiane Prefecture	Vientiane	836,000			
	Sainyabuli province	Xayabury District (Sainyabuli)	395,000			
	Sekong province	La Mam District (Sekong)	124,000			
	Xaisomboun province	Anouvong District (Anouvong)	98,000			

Location	Province	Capital	Population (2023 census)	Male	Female	# of HCFs
	Xiangkhouang province	Pek District (Phonsavan)	254,000			
		Total	**6,730,000**			

NOTE: if children, elderly and disabled can also be segregated, will be easy to focus on targeted population during emergencies.

Annex IV: Global standard for WASH in HCFs

UNICEF/WHO JOINT MONITORING PROGRAMME BASIC WASH SERVICE LEVEL FOR HCFs

	WATER	SANITATION	HYGIENE	WASTE MANAGEMENT	ENVIRONMENTAL CLEANING
BASIC SERVICE	Water is available from an improved source on the premises.	Improved sanitation facilities are usable, with at least one toilet dedicated to staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility.	Functional hand hygiene facilities (with water and soap and/or alcohol-based hand rub) are available at points of care, and within five metres of toilets.	Waste is safely segregated into at least three bins, and sharps and infectious waste are treated and disposed of safely.	Basic protocols are available and all staff with cleaning responsibilities have received training.

Source: WHO, JMP, and UNICEF (2019). WASH in Health Care Facilities: Global Baseline Report 2019.

Emergency Handbook : UNHCR 2023 ii. Emergency Response Framework: IFRC 2027 (basic global emergency response protocol referred)

Type of need	Quantity	Comments
Survival (drinking and food)	2.5 to 3 lpd	Depends on climate and individual physiology
Basic hygiene practices	2 to 6 lpd	Depends on social and cultural norms
Basic cooking needs	3 to 6 lpd	Depends on food type, social and cultural norms
Total	**7.5 to 15 lpd**	lpd: Litres per day

Source: Adapted from Sphere. Also see WHO, 2011. *Guidelines for drinking-water quality, 4th edition*. World Health Organization, Geneva. http://www.who.int/water_sanitation_health/publications/2011/dwq_chapters/en/index.html

Time – from initial intervention	Quantity of water (litres/person/day)	Maximum distance from shelters to water points (km)
2 weeks to 1 month	5	1
1 to 3 months	10	1
3 to 6 months	15 (+)	0.5

Source: Adapted from Sphere. Also see WHO, 2008. *Essential environmental health standards in health care*. World Health Organization, Geneva. http://www.who.int/water_sanitation_health/hygiene/settings/ehs_hc/en/

Annex V: ERT Generic TOR Sample:

ERT Roles and Responsibilities

Employers should review plans with employees when initially put in place and re-evaluate and amend the plan periodically whenever the plan itself, or employee responsibilities, change. Emergency procedures, including the handling of any toxic chemicals, should include:

- Escape procedures and escape route assignments
- Special procedures for employees who perform or shut down critical plant operations
- Systems to account for all employees after evacuation and for information about the plan
- Rescue and medical duties for employees who perform them
- Means for reporting fires and other emergencies.
- Contacts for information about the plan.

A Chain of Command and an Emergency Response Team should be set up to prepare for an emergency before it happens.

Chain of Command
The employer should designate an emergency response coordinator and a backup coordinator. The coordinator may be responsible for plant-wide operations, public information and ensuring that outside aid is called. Having a backup coordinator ensures that a trained person is always available. Employees should know who the designated coordinator is. Duties of the coordinator and employer include:

- Determining what emergencies may occur and seeing that emergency procedures are developed to address each situation.

Emergency Response Team
Members of emergency response teams should be thoroughly trained for potential emergencies and physically capable of carrying out their duties; know about toxic hazards in the workplace and be able to judge when to evacuate personnel or depend on outside help. One or more teams must be trained in:

- Use of various types of fire extinguishers.
- First aid, including cardiopulmonary resuscitation (CPR) and self-contained breathing apparatus (SCBA).
- Shutdown procedures.
- Chemical spill control procedures.
- Search and emergency rescue procedures
- Hazardous materials emergency response.
- Familiar of all the WASH systems in HCFs and at the central level

Industrial Emergency Response Teams are the onsite First Responders and assigning responsibilities is one of the crucial steps in emergency response. If your emergency response team members are not familiar with their responsibilities, important response actions may be missed.
The first person on-scene will typically serve as the Incident Controller (IC), until relieved by a more senior person.

Responsibilities for the first person on-scene may include:

- Taking appropriate personal protective measures
- Advising personnel in the area of any potential threat and/or initiate evacuation procedures
- Eliminate potential ignition sources

- Notifying Supervisory Personnel and/or Incident Commander of the incident

Supervisory Personnel responsibilities may include:

- Restrict access to the incident scene and surrounding area as the situation demands
- Take any other steps necessary to minimize any threat to health and safety
- Request medical assistance, if necessary
- Verify substance released and obtain Material Safety Data sheets, as necessary
- Identify and isolate source to minimize product loss
- Coordinate further response actions with Incident Commander and local responders

Incident Controller responsibilities may include:

- Activate the Emergency Response team
- Appoint a Safety Officer
- Activate additional response contractors and local resources
- Evaluate the Severity, Potential Impact, Safety Concerns, and Response Requirements based on the initial information provided by the First Person On-Scene
- Confirm safety aspects at site, including need for personal protective equipment, sources of ignition, and potential need for evacuation
- Communicate and provide incident briefings to company superiors, as appropriate
- Coordinate/complete additional internal and external notifications
- Communicate with Emergency Response Team, as the situation demands
- Direct response and clean-up operations

The number of personnel required to staff the Emergency Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the Incident Controller directly or delegated as the situation demands. The Incident Controller should always be responsible for directing the response activities and should assume the duties of all the primary positions until the duties can be delegated to other qualified personnel. The more knowledgeable individuals are of their roles and responsibilities during an emergency event, the better prepared a team can be to implement a streamlined response.

Annex VI: Hand Washing Guidance for Health Care (WHO 2023)

Annex VII: Sphere standards for WASH

SPHERE2 - chapter 2 - Min standards in water, s...

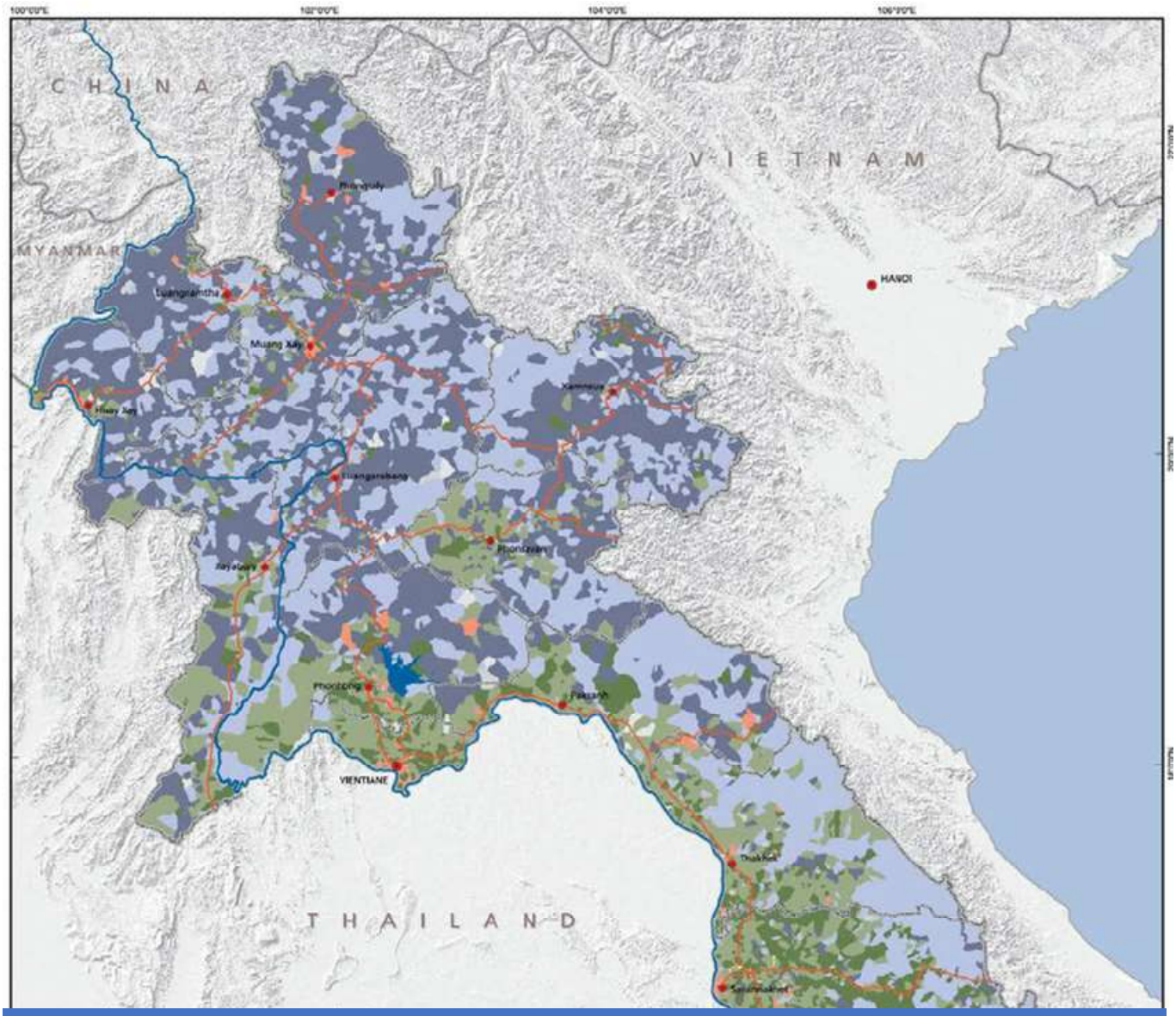
Glossary : WASH (Water Supply, Sanitation and Hygiene) Terminologies

Terminology	Details
Affordability	The extent to which prices (e.g., water supply and sanitation) are within the financial means of users. An important consideration in service planning relating to choice of service level and pricing.
Aqua-privy	A low-water use alternative where water is scarce. Generally, excreta falls directly from a squatting plate into a septic tank, without passing through a water seal. The solids settle into the septic tank, and the effluent is discharged into a soak-pit.
Artesian	A type of well in which water flows spontaneously (e.g., fountain-like) from internal pressure to the surface. Artesian wells are usually of small diameter and often of great depth.
Baye Pelle	A term used for individuals (usually private entrepreneurs) who offer manual latrine pit emptying services
Bio Gas	Gas is produced by fermentation of organic materials, such as fecal matters. It can be used as a combustible or to generate electricity
Black water	Waste water carrying urine and feces from toilet facilities.
Borehole	A hole bored or drilled in the earth, as: a - an exploratory well, and b - (chiefly British) a small-diameter well drilled especially to obtain water. Sometimes called 'borewell'
Brackish Water	Water with a higher concentration of salt as compared to fresh water, particularly as a result of mixing seawater and fresh water.
Carters	Persons who carry or supply water
Compost	Product obtained through the decomposition of organic waste mixed. It improves soil structure and provides nutrients to plants
Cesspool	An underground tank that is used where there is no sewer and into which household sewage or other liquid waste is drained to permit leaching of the liquid into the surrounding soil. Sometimes called Holding Tank, Seepage Pit or Soak Pit.
Chlorination	To treat with chlorine; chlorine is used as disinfectant in water purification.
Cistern	an artificial reservoir (as an underground tank) for storing liquids and especially water (as rainwater)
Concessionaires	A concession gives the private partner responsibility not only for the operation and maintenance of a utility's assets but also for investments.
Ecosan	refers to the on-plot handling (with or without urine separation) of excreta with minimal use of water so that urine nutrients and sanitized biomass are the end products.
Fecal sludge	The slurry contains both solid and liquid waste that accumulates in onsite sanitation systems (OSS) e.g. septic tanks. It is raw or partially digested slurry that results from the collection, storage, or treatment of combinations of excreta and blackwater, with or without greywater.
Fecal Sludge Management	The collection, transport, and treatment of fecal sludge from pit latrines, septic tanks, or other onsite sanitation systems
Fecal Sludge Treatment Plant (FSTP)	Location and systems where scientific practices for treating the collected sludge from the onsite that ensures safe collection, transportation, treatment, and disposal of onsite collected excreta without polluting the environment and public health
Grey Water	Waste water produced by washing and bathing and which contains no urine or feces.

Holding Tank	An underground tank that is used where there is no sewer and into which household sewage or other liquid waste is drained to permit leaching of the liquid into the surrounding soil. Sometimes called Cesspool, Soak Pit or Seepage Pit.
Hygiene	Rules and practices that helps to maintain or improve health (Individual & public)
Jerrycan (also jerrican)	A container used to hold liquids, typically made of plastic. Jerrycans typically hold 20 liters (about 5 gallons), although volumes range from 3 to 30 liters.
Latrine	a receptacle (as a pit in the earth) for use as a toilet. A structure usually consisting of hole in the ground, used as sanitary facilities for human beings. The purpose of latrine is both to ensure health of its users by containing the excreta and to protect environment. Latrine is made of several elements slab, structure, pit
Manual desludging	Manual desludging consists of manual emptying of latrine pits. This is done by small-scale private operators who work informally.
Mechanical desludging	This is emptying latrine pits with tank trucks and suction pumps. This allows fecal sludge to be conveyed to identified sites such as treatment plants and dumping spaces. This reduces the risks of infections and contamination at households levels. This is done either on demand or on pre-defined schedules.
Night-soil	Human excrement collected for fertilizing the soil
Open Defecation	Practice defecating outside homes and public toilets in the open. This practice triggers the contamination of water sources with fecal matters causing harmful affect to public health and environment. On average 13% of the population globally defecates in open.
Pour-flush toilet	a type of latrine where a water seal trap is used to prevent smells and to check flies and mosquitoes. Used where water is the common form of anal-cleansing.
Rainwater harvesting	the collections and use of rainwater for domestic and agricultural purposes.
Sanitation	Provision of facilities and services for the safe disposal of human urine and feces. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal."
Seepage Pit	A tank in which organic solid matter of continuously flowing sewage is deposited and retained until it has been disintegrated by anaerobic bacteria. Also called Soak Pit, Leeching Pit, or Cesspool.
Septic Tank	A tank in which organic solid matter of continuously flowing sewage is deposited and retained until it has been disintegrated by anaerobic bacteria.
Sewage; Sewer; Sewerage	Sewage is the effluent in a pipe network. A sewer is the conduit - usually a pipe - used to carry off water and waste matter. Sewerage is the complete system of sewers.
Sludge	a :muddy or slushy mass, deposit, or sediment: as precipitated solid matter produced by water and sewage treatment processes b : muddy sediment in a steam boiler c : a precipitate or settling (as a mixture of impurities and acid) from a mineral oil
Soak Pit	a simple hole, sometimes lined, where effluent is held and slowly seeps into the ground through perforated sides and bottom. A secondary stage of treatment takes place through biological breakdown in the pit.
Solid / Liquid Waste	Solid: All items from homes and businesses that people no longer have any use for. These wastes are commonly called trash or garbage and include items such

	as food, paper, plastics, textiles, leather, wood, glass, metals, sanitary waste in septic tanks, and other wastes. Liquid: waste materials that appear in the form of liquid matter. Waste management and the proper disposal of liquid waste are important for maintaining the safety of the environment and production processes
Squatter	An individual or household occupying land to which it does not have formal title.
Suction Truck	A vehicle used for mechanized sludge removal from septic tanks and lined latrine pits.
Sullage:	general term for refuse, sewage.
Standpipe, Standpost	A pipe riser with a tap (faucet) used as a source of water, usually located publicly. Note: The term 'standpipe' also refers to a high vertical pipe or reservoir that is used to secure uniform pressure in a piped water supply system, particularly in technical publications.
Ventilated improved pit latrine (VIP)	A dry latrine system, with a screened vent pipe to trap flies and often with double pits to allow use on a permanent rotating basis. Considered a safe, hygienic means of excreta disposal.
Wastewater treatment	Wastewater treatment typically involves a three-phase process: (1) First, in the primary wastewater treatment process untreated water is passed through a series of screens to remove solid wastes; (2) Second, screened wastewater is then passed a series of holding and aeration tanks and ponds; and (3) Third, flocculation basins, clarifiers, filters, and chlorine basins or ozone or ultraviolet radiation processes.
Willingness to pay:	A measure of demand for levels of water supply and/or sanitation service. Often assessed as part of a contingent-valuation study, in which demand for service improvements at the community level is estimated.
Water Quality test	The test measures the presence and amount of certain germs in water. In most cases, the presence of WQIs is not the cause of sickness; however, they are easy to test for and their presence may indicate the presence of sewage and other disease-causing germs from human and/or animal feces.
Water Quality test kit	The kit can be used to test 10 different water quality parameters- pH, temperature, Chloride, total hardness, Iron, Ammonia, Nitrate, Phosphate, Free Residual etc. But there are a variety of Kits that can be specific to testing of parameters with portable and non-portable devices.
WASH	Water Sanitation and Hygiene
Value Chain	All fecal sludge management processes from containment, emptying, collection, transportation, treatment to final disposal.

B: DISTRIBUTION PLAN



Water Supply and Sanitation Distribution Plan (in HCFs During Emergencies)

Water Supply and Sanitation : Emergencies

MOH Government of Lao PDR 12/28/23 Final Version

Table of Contents

1. Introduction

1.1 Purpose of the Plan

The key purpose of a water supply and sanitation distribution plan for healthcare facilities (HCFs) during emergencies in Laos, is to ensure that the critical institutions like Health Care Facilities have access to safe and sufficient water and sanitation services during times of crisis. This will also give an overview of the current supply and services that can be assessed for the emergency time depending on the intensity and nature of emergencies. Having a well-structured water supply and sanitation distribution plan for HCFs is critical to safeguarding public health and ensuring the resilience of the healthcare system during challenging times.

1 Scope and Objectives

SCOPE	OBJECTIVES
• Identify all healthcare facilities in Laos, including hospitals, clinics, and other medical centers, and **assess their specific water and sanitation needs** during emergencies.	• Ensure that all HCFs in Laos have access to **adequate safe and clean water** for medical treatment, sanitation, and other essential services during emergencies.
• Evaluate the potential **risks and vulnerabilities** of each HCF to **various types of emergencies**, such as floods, earthquakes, disease outbreaks, and other natural or man-made disasters.	• Implement measures to maintain **adequate sanitation standards** in HCFs, including the proper disposal of medical waste and the provision of functional sanitation facilities for patients, staff, and visitors.
• Conduct a comprehensive **assessment of the existing water supply and sanitation infrastructure** in each HCF, including water sources, storage facilities, distribution systems, and sanitation facilities.	• Develop a comprehensive emergency **response plan** to address **potential water supply and sanitation challenges**, including protocols for rapid deployment of resources and personnel in times of crisis.
• Determine the **availability of resources**, including water storage, treatment facilities, sanitation equipment, and human resources, needed to ensure the functionality of water supply and sanitation services during emergencies.	• Ensure the **continuity of healthcare services** by safeguarding the **water supply and sanitation infrastructure** of HCFs, thereby enabling the provision of essential medical services to patients in need.
• Establish **coordination mechanisms** with local authorities, relevant government agencies, and non-governmental organizations to ensure a coordinated and efficient response to water and sanitation needs during emergencies.	• Implement measures to **prevent the spread of waterborne diseases and other infections** within HCFs and their surrounding communities by maintaining high standards of hygiene and sanitation.
• Involve **local communities** in the planning process and identify ways to collaborate with them to support water supply and sanitation services in HCFs during emergencies.	• **Framework** to assess the effectiveness of the **water supply and sanitation distribution plan**, identify areas for improvement, and ensure compliance with established standards and regulations.
ACCESS TO CLEAN WATER AND SANITATION IS HUMAN RIGHT, NOT A PROVILEDGE LUXURY	

1.3 Overview of Emergency Water Supply Distribution for HCFs

Emergency water supply distribution for healthcare facilities (HCFs) during emergencies in Laos involves a coordinated effort to ensure that healthcare facilities have access to clean and safe water, which is crucial for the well-being of patients and the effective operation of medical services. Typically, this process involves the deployment of water storage and purification systems, along with the establishment of distribution networks to ensure that HCFs receive a continuous supply of water. Additionally, emergency response teams work closely with local authorities and international aid organizations to facilitate the transportation and delivery of water to affected healthcare facilities. The aim is to prevent the spread of water-borne diseases and to maintain sanitary conditions within healthcare settings, thereby safeguarding the health and safety of patients and medical staff during emergency situations.

The country has also adopted and formalized a National Disaster Management Law in 2020 to strengthen disaster preparedness and response, which will facilitate strengthened resilient WASH programming. Furthermore, a Climate Change and Health Adaptation Strategy (2018-2025) and Action Plan (2018-2020) was also developed and approved by Ministry of Health.

Access Areas	Progress till Date (as per 8th NSEDP)	Target till 2025 (as per 9th NSEDP)
Basic Sanitation	75% (2019)	85%
Basic Water	85% (2019)	95%

WHO minimum WASH standards in HCFs

- Availability of safe and adequate water for drinking, medical purposes such as sterilization, surgery and deliveries, food preparation, showering and laundry;
- Accessible and clean toilets, separate for men and women in sufficient numbers for staff, patients, visitors, people with special needs such as disabled, very sick people etc;
- Improved hand washing practices among health care staff through orientation and training
- Proper health care waste management and safe disposal of excreta and wastewater;
- Clear and practical communication with patients and visitors, including caregivers about hygiene promotion

2. Water and Sanitation Needs Assessment

Emergencies can cause community-wide disruption and illness if water is contaminated with germs, chemicals, or toxins. Water-related emergencies can be created by natural disasters such as hurricanes, floods, and droughts; man-made disasters, such as chemical spills; or waterborne disease outbreaks. Many diseases can be prevented by creating and storing an emergency water supply, knowing how to make water safe, learning about drinking water advisories, and following hygiene practices during an emergency.

During a water-related emergency or outbreak, safe drinking water may not be available.

2.1 Assessment Methodology

Supplying water to the customers during regular and emergency situation involves four major elements:

For each element there are specific considerations associated with its operations and management. The key points to be noted are:

i. Legal and regulatory constraints ii. Financial terms iii. Vertical and horizontal coordination iv. Infrastructure v. staffing vi. Maintenance vii. Inclusive service assurance

These points are to be considered and assessed in each element of the service chain. The assessment required following assumptions:

i. Water use per capita ii. Time-scale of outages iii. Population affected iv. Water quality targets

The key building blocks of the sources identification are: i. local sources (treated and un-treated ii. Neighborhood water utilities iii. Bulk water transport iv. Pre-packed water . Mainly the sources like a. surface water b. ground water are non-treated and the source like a. piped water b. trucked c. packed are treated water (the key assumption).

The different water supply building blocks can also be categorized as per the distribution mediums.

Water Source	Distribution mediums	
	Through existing system	Specific sites
Normal Source	• System resilience • Emergency equipment (generators, replacements of pipes • Additional Storage • Household treatment (POU)	• Treated water transported from tanks, trucks, hydrants, reservoirs to un-served areas
Local alternative sources	• Emergencies / pre-existing connections to distribution systems (with or without treatment) to meet the gaps from ground water or surface water	• with or without treatment for ground water or surface water
Neighborhood utilities (including bulk water)	• piped inter-connection with neighboring utilities	• mutual agreement : treated water transported to needed designated sites
Pre-packed water	• NA	• Vendor contract or federal coordination for affected area distribution (specially for drinking purpose only as will be costly)

2.2 Water Demand Analysis and Safe Sanitation Provisions for HCFs

Analyzing water demand for healthcare facilities (HCFs) during emergencies in Laos would involve considering factors such as the number of patients, staff, and their water usage patterns, as well as the requirements for medical procedures and sanitation. Additionally, assessing the impact of the emergency on the local water infrastructure and supply would be crucial for understanding the feasibility of meeting increased demand. Such analysis can help in designing effective water management strategies and ensuring the availability of sufficient water resources to support the critical needs of HCFs during emergencies.

The key considerations during this analysis are:

a. Assess Facility Types and Sizes: Identify the types and sizes of healthcare facilities in different regions of Laos. Consider factors such as hospitals, clinics, and health posts, each with varying capacities and water usage requirements.
b. Evaluate Current Water Infrastructure: Assess the existing water infrastructure in healthcare facilities. Consider the capacity of water sources, storage facilities, and distribution systems. Evaluate the resilience of the infrastructure to potential disruptions during emergencies.

c. Estimate Water Needs: Calculate the water needs for each healthcare facility based on the type of facility, the number of patients, staff, and services provided. Include water requirements for medical procedures, sanitation, and general facility operations.
d. Consider Specialized Needs: Identify any specialized water needs during emergencies, such as increased demand for hand hygiene, sterilization, and sanitation to prevent the spread of diseases.
e. Factor in Contingencies: Plan for contingencies by considering potential disruptions to the water supply chain. This could include damage to infrastructure, contamination of water sources, or increased demand due to a surge in patients.

3. Identification of Critical Water Needs:

a. Basic Water Supply: Ensure a continuous and reliable water supply to meet the basic needs of healthcare facilities. This includes drinking water for patients and staff, water for food preparation, and sanitation purposes.
b. Sanitation and Hygiene: Maintain proper sanitation and hygiene standards to prevent the spread of infections. This involves providing adequate water for handwashing, maintaining clean and functional toilets, and ensuring proper disposal of medical waste.
c. Medical Equipment Sterilization: Access to clean water is crucial for sterilizing medical equipment. In emergencies, the demand for sterile equipment may increase, so there should be a reliable water source for this purpose.
d. Patient Care: Adequate water is essential for patient care, including cleaning wounds, maintaining personal hygiene, and facilitating general care activities. Emergency situations may result in a higher number of patients, making water availability even more critical.

Every HCF should have the ability to supply water from storage tanks for at least 72 hours in case the main source is not functional.

4. Alternative Water Sources and Sanitation Options

4.1 Identification of Potential Water Sources

a. Water Sources: Identify existing water sources in and around the healthcare facility. This may include municipal water supplies, wells, rivers, or nearby water bodies.
Temporary Water Sources: Water Tankers: Consider using water tankers to deliver safe water to the healthcare facility, especially if the existing water supply is compromised.
Boreholes and Wells: Assess the feasibility of drilling boreholes or utilizing existing wells for a temporary water supply
Water Purification: Implement water treatment methods such as chlorination, filtration, or use of water purification tablets to ensure the safety of water for consumption.
b. Sanitation Facilities: Assess the current state of sanitation facilities within the healthcare facility, including toilets, sewage systems, and waste disposal.
Sanitation Facilities Setup: Temporary Toilets: Set up temporary toilets if existing facilities are damaged or inadequate. Portable toilets may be considered.
c. Waste Management: Develop a waste management plan for safe disposal of medical and general waste, preventing the spread of diseases.

4.2 Evaluation of Water Sources for Quality and Accessibility

a. Quality of Water Sources:

Microbiological and Chemical Analysis: Conduct thorough testing for microbial contamination and chemical pollutants in water sources. This includes testing for bacteria, viruses, parasites, and chemicals such as heavy metals.
Compliance with Standards: Evaluate water quality based on national and international standards for drinking water. Ensure that the water meets the World Health Organization (WHO) guidelines and any relevant national regulations.

b. Accessibility of Water Sources:

Proximity to HCFs: Assess the distance between water sources and healthcare facilities. Closer proximity reduces transportation challenges, ensuring a more reliable water supply during emergencies.
Infrastructure and Distribution: Evaluate the infrastructure supporting water distribution. This includes the condition of pipes, pumps, and storage facilities. Ensure that the system can handle the increased demand during emergencies.

A comprehensive evaluation considering these factors will contribute to the development of a resilient and sustainable water supply system for healthcare facilities in Laos during emergencies. Regular reviews and updates to the evaluation criteria are important to ensure the effectiveness of the water management strategy over time.

4.3 Extraction and Transportation Plan

Developing an extraction and transportation plan for water supply during emergencies, specifically for Healthcare Facilities (HCFs), is crucial to ensure the continuous operation of essential services.
Water Source Identification: Identify and map nearby water sources, such as rivers, lakes, or groundwater, that can serve as emergency water supplies. Ensure the water sources are safe and can meet the quality standards for healthcare facilities.
Water Extraction Equipment: Acquire and maintain water extraction equipment, such as water pumps, hoses, and filtration systems. Ensure that the equipment is easily deployable and can handle the required volume of water.
Storage Facilities: Establish on-site water storage facilities at HCFs, such as water tanks or reservoirs, to store an emergency supply. Regularly inspect and maintain the storage facilities to ensure cleanliness and functionality.
Water Quality Monitoring: Implement a robust water quality monitoring system to ensure that the extracted water meets health and safety standards. Regularly test the water for contaminants and treat it accordingly.
Transportation Plan: Develop a transportation plan for delivering water from the extraction point to the HCFs. Identify suitable vehicles (tanker trucks, portable water containers) for transportation. Establish routes and transportation schedules, taking into account the urgency and volume of water needed.

5. Water Treatment and Purification Systems

Water purification in healthcare facilities (HCFs) during emergencies is crucial to ensure the availability of safe and clean water for medical procedures, patient care, and overall facility operations. The selection of appropriate treatment technologies depends on various factors, including the nature of the emergency, available resources, and the specific contaminants present in the water. Here are some considerations and technologies commonly used for water purification in healthcare facilities during emergencies:

5.1 Selection of Appropriate Treatment Technologies

a. Nature of the Emergency:

Natural Disasters: In the case of natural disasters like hurricanes, floods, or earthquakes, there may be an increased risk of microbial contamination. Technologies that effectively remove or inactivate pathogens, such as bacteria and viruses, are essential.

Chemical Spills or Contamination: If the emergency involves chemical spills or contamination, the focus should be on technologies that can remove or neutralize specific chemical contaminants.

b. Available Resources:

Power Supply: Consider the availability and reliability of power. Some treatment technologies require electricity, while others can operate without it.

Expertise: The level of expertise available for installation, operation, and maintenance of the water treatment system should be considered.

c. Water Quality Analysis: Conduct a thorough analysis of the water source to identify the specific contaminants present. This will guide the selection of appropriate treatment technologies.

d. Common Water Purification Technologies:

Boiling: Boiling water is a simple and effective method to kill most microorganisms. However, it may not be practical for large quantities of water or in situations with fuel shortages.

Filtration: Filtration systems can remove particles, sediment, and some microorganisms. Options range from portable hand-pump filters to larger, more sophisticated systems.

Chemical Disinfection: Chemicals such as chlorine, iodine, or chlorine dioxide can be used for disinfection. However, these may not be suitable for chemical contamination scenarios.

UV Treatment: Ultraviolet (UV) light can be used to disinfect water by inactivating microorganisms. UV systems are effective against bacteria and viruses but do not remove chemical contaminants.

Reverse Osmosis (RO): RO systems are effective in removing a wide range of contaminants, including bacteria, viruses, and chemicals. However, they may require a stable power supply and maintenance.

e. Portable vs. Stationary Systems:

Portable systems are suitable for immediate response and can be quickly deployed. Stationary or larger-scale systems may be necessary for sustained operations in healthcare facilities.

Regulatory Compliance: Ensure that the chosen water purification system complies with relevant health and safety regulations and standards.

5.2 Installation and Operation Guidelines

Installation Guidelines	Operational Guidelines
Assessment and Planning: • Conduct a thorough assessment of the water supply infrastructure and identify potential risks and vulnerabilities. • Develop a comprehensive emergency water supply plan that includes treatment options, distribution systems, and contingency measures.	Regular Monitoring: • Implement a robust monitoring system to regularly assess water quality throughout the facility. • Monitor key parameters such as turbidity, chlorine levels, and microbial contamination.
Emergency Water Treatment Systems: • Install reliable and portable water treatment systems capable of handling the facility's water needs during emergencies.	Water Treatment Protocols: • Develop and implement water treatment protocols based on the specific needs and conditions of the healthcare facility.

• Consider technologies such as water purification units, filtration systems, and chemical disinfection methods.	• Follow recommended guidelines for emergency water treatment from relevant health authorities.
Storage Facilities: • Ensure an adequate supply of clean water by installing emergency water storage facilities, such as water tanks or containers, with a capacity sufficient for the expected duration of the emergency. • Regularly inspect and maintain these storage facilities to prevent contamination.	Record Keeping: • Maintain detailed records of water quality testing, treatment activities, and equipment maintenance. • Keep records accessible for inspection by relevant authorities.
Backup Power Supply: • Install backup power systems for water treatment equipment to ensure continuous operation during power outages.	Regular Maintenance: • Schedule routine maintenance for water treatment equipment to prevent malfunctions and ensure optimal performance. • Have spare parts and supplies on hand for quick repairs.
Personnel Training: • Train facility staff on the installation, operation, and maintenance of emergency water treatment systems. • Conduct regular drills and simulations to ensure staff readiness.	Contingency Planning: • Develop contingency plans for alternative water sources in case of equipment failure or depletion of stored water. • Establish agreements with local water suppliers for emergency support.

5.3 Quality Control and Monitoring Procedures

Establishing Baseline Water Quality: Determine the baseline water quality parameters before the emergency to provide a reference for comparison during and after the emergency. Measure key parameters such as turbidity, pH, total dissolved solids (TDS), and chlorine levels.

Continuous Monitoring: Implement continuous monitoring systems to track key water quality parameters in real-time. Use online sensors and monitoring equipment to provide immediate feedback on changes in water quality.

Sampling and Laboratory Analysis: Conduct regular water sampling at various points in the distribution system. Perform laboratory analyses for a comprehensive assessment of water quality, including microbiological testing, chemical analysis, and physical measurements.

Water Treatment Process Controls: Implement and monitor water treatment processes to ensure that they are effective in removing or inactivating contaminants. Adjust treatment processes as needed based on real-time monitoring results.

Chlorination and Disinfection: Use appropriate disinfection methods, such as chlorination, to ensure the destruction of harmful microorganisms. Monitor chlorine levels throughout the distribution system to maintain an effective residual concentration.

Public Awareness: Communicate with the public about the emergency situation, the safety of the water supply, and any precautionary measures they should take. Provide clear instructions on water usage and consumption during the emergency.

Regulatory Compliance: Ensure that all water treatment and monitoring activities comply with relevant regulatory standards and guidelines.

6. Storage Facilities

6.1 Types of Storage Solutions for Emergency Water Supply

Healthcare facilities (HCFs) need reliable and efficient storage solutions for emergency water supply to ensure continuous operation during disruptions such as natural disasters or infrastructure failures. Here are some types of storage solutions commonly used for emergency water supply in healthcare facilities:

a. Water Tanks:

Above-Ground Tanks: These are large, often elevated tanks that can store a significant amount of water. They are relatively easy to install and maintain.

Underground Tanks: These tanks are installed below the ground surface, providing protection against external elements. They are space-efficient but may be more challenging to install and maintain.

b. Water Barrels and Drums:

Portable Barrels: Smaller water barrels or drums can be strategically placed throughout the facility for quick access to water during emergencies. They are portable and can be easily moved to different locations as needed.

Rain Barrels: In some cases, rain barrels can be used to collect and store rainwater, providing an additional source of water during emergencies.

c. Bladders and Flexible Tanks:

Collapsible Water Bladders: These are flexible, collapsible tanks that can be set up quickly and are suitable for temporary water storage. They are often used in emergency response situations.

Pillow Tanks: Similar to bladders, these are large, flexible tanks that can be set up on-site and filled with water. They are space-efficient when not in use.

Cisterns:

d. Concrete Cisterns:

Underground or above-ground concrete cisterns can provide a substantial and durable water storage solution. They are often used for long-term water storage needs.

e. Water Buffers and Hydropneumatic Tanks:

Hydropneumatic Tanks: These tanks use compressed air to maintain pressure in the water system. They are commonly used in conjunction with pumps to ensure a consistent and pressurized water supply.

f. Water Buffers:

These tanks store water for immediate use, helping to manage fluctuations in water demand and ensuring a stable water supply.

g. Interconnected Systems:

Interconnected Reservoirs: Connecting multiple storage systems, such as tanks and cisterns, can provide a redundant and resilient water supply. This approach enhances the reliability of the emergency water storage system.

h. Water Wells and Boreholes:

On-Site Wells: If feasible, healthcare facilities can have on-site wells or boreholes to access groundwater. Proper filtration and treatment systems are necessary to ensure water quality.

i. Water Treatment and Purification Systems:

Emergency Water Purification Units: In addition to storage, healthcare facilities should consider having water treatment systems in place to purify available water sources during emergencies.

When implementing emergency water storage solutions, it's crucial to consider factors such as the facility's water consumption, the duration of potential disruptions, local regulations, and the need for water treatment to ensure the safety and quality of the stored water. Regular maintenance and testing of the storage systems are also essential to guarantee their functionality during emergencies.

6.2 Capacity Planning for Water Storage

Regulatory Compliance: Ensure compliance with local regulations and guidelines regarding water storage and emergency preparedness in healthcare facilities.

Emergency Water Supply Sources: Identify and secure alternative water supply sources in case the primary water source is compromised during emergencies. This could include on-site wells, water tanks, or agreements with local water suppliers.

Storage Capacity: Determine the required storage capacity based on the estimated water needs during an emergency. This should take into account the duration of the emergency, the number of patients, staff, and essential operations that need water.

Types of Storage Systems: Consider various types of water storage systems, such as large water tanks, underground cisterns, or portable water containers. The choice of system will depend on factors like available space, budget, and the specific needs of the healthcare facility.

Distribution System: Develop a distribution system to ensure the efficient and equitable supply of water throughout the facility during an emergency. This may include pipelines, pumps, and water distribution points.

Water Treatment and Purification: Implement water treatment and purification systems to ensure that stored water is safe for consumption. This is especially important in situations where the quality of the water supply may be compromised.

6.3 Maintenance and Hygiene Practices for Storage Facilities

Regular Inspection and Cleaning: Schedule regular inspections of water storage facilities to identify and address any issues promptly. Clean water storage tanks and containers regularly to prevent the buildup of sediment, biofilm, and contaminants.

Water Quality Testing: Implement a regular water quality testing program to ensure that the stored water meets the required standards for potability. Test for common contaminants such as bacteria, viruses, and chemical pollutants.

Secure Storage: Ensure that water storage facilities are secure to prevent unauthorized access and contamination. Install locks and fencing around water storage areas to protect against tampering.

Emergency Water Treatment: Have a plan in place for emergency water treatment in case the primary water supply is compromised. Stockpile water treatment supplies such as water purification tablets, chlorine, or water filters.

Backup Water Sources: Identify and establish alternative water sources in case the primary supply is disrupted during emergencies. Consider installing backup water storage tanks or containers.

Documentation and Record-Keeping: Maintain detailed records of water quality testing, maintenance activities, and any issues identified. Document emergency response plans, including procedures for handling water-related emergencies.

Staff Training: Train healthcare facility staff on proper water storage and hygiene practices.
Conduct regular drills to ensure that staff is familiar with emergency response procedures related to water supply.

Communication Protocols: Establish clear communication protocols for reporting water-related issues or emergencies. Ensure that staff members know how to communicate effectively during emergencies to coordinate a swift response.

Regular Maintenance of Plumbing Systems: Inspect and maintain the facility's plumbing systems regularly to prevent leaks and contamination. Address any plumbing issues promptly to avoid compromising the water supply.

Waste Disposal: Properly manage and dispose of waste generated from cleaning and maintenance activities to prevent environmental contamination.

7. Distribution Mechanism

7.1 Design of Water Distribution Network within HCFs

Designing a water distribution network within healthcare facilities (HCFs) during emergencies is crucial to ensure the availability of clean and safe water for medical and sanitary purposes. Here are some key considerations and steps to guide the design process:

a) Understand Requirements:
- Identify Critical Areas: Determine the critical areas within the healthcare facility that require water, such as patient care units, surgical units, sanitation facilities, and emergency response areas.
- Estimate Water Demand: Calculate the water demand for each critical area based on the number of occupants and the specific needs of each space.

b) Source of Water:
- Emergency Water Supply: Identify and establish a reliable emergency water supply source. This may include water storage tanks, water wells, or connections to municipal water supplies.
- Backup Sources: Plan for backup water sources in case the primary source becomes unavailable. This could involve establishing agreements with nearby facilities or having portable water supply solutions.

c) Distribution System Design:
- Pipeline Layout: Design a distribution system layout that ensures efficient and reliable water supply to critical areas. Consider the use of redundant pipelines to minimize the risk of failure.
- Pressure Zones: Divide the facility into pressure zones to ensure adequate water pressure for various functions. Critical areas may require higher pressure compared to less critical areas.

d) Water Treatment and Quality:
- Water Treatment Facilities: Implement water treatment facilities to ensure that the water supplied to the healthcare facility meets health and safety standards.
- Quality Monitoring: Establish a water quality monitoring system to regularly test and ensure the water meets required standards.

e) Storage and Resilience:
- Water Storage: Include storage facilities such as elevated tanks or ground-level reservoirs to store an emergency supply of water.
- Resilience Planning: Design the system with redundancy and resilience in mind. Consider the possibility of system failures or damage during emergencies.

f) Emergency Protocols:
- Emergency Shut-off Procedures: Implement emergency shut-off procedures and isolation valves to quickly address leaks or other issues in the system.
- Emergency Response Plan: Develop an emergency response plan that outlines the steps to be taken in case of water supply disruptions or contamination.

g) Accessibility and Inclusivity:
- Accessibility: Ensure that water distribution points are easily accessible to all, including patients with mobility challenges.
- Inclusivity: Consider the needs of all occupants, including those with specific medical requirements or conditions.

h) Regulatory Compliance:
- Local Regulations: Ensure that the water distribution network design complies with local regulations and standards for healthcare facilities.

i) Regular Maintenance:
- Scheduled Inspections: Implement a schedule for regular inspections and maintenance of the water distribution system to identify and address issues promptly.

By integrating these considerations into the design process, you can create a robust and resilient water distribution network within healthcare facilities to meet the needs of both routine operations and emergency situations.

7.2 Allocation and Scheduling of Water Supply

Allocation and scheduling of water supply in healthcare facilities (HCFs) during emergencies is a critical aspect of emergency preparedness and response planning. Access to clean and sufficient water is essential for various healthcare activities, including patient care, sanitation, and infection control. Here are some key considerations for the allocation and scheduling of water supply in HCFs during emergencies:

Water Storage and Reserves: Ensure that healthcare facilities have sufficient on-site water storage capacity to meet the basic needs during emergencies. This may include installing water tanks or reservoirs.

Emergency Water Sources: Identify alternative water sources in the vicinity of healthcare facilities that can be tapped into during emergencies. This may include collaborating with local authorities, neighboring facilities, or water suppliers.

Prioritization of Water Use: Prioritize the use of water for critical healthcare services, such as patient care, sterilization of medical equipment, and sanitation in high-risk areas.

Water Conservation Measures: Implement water conservation measures within the healthcare facility, such as the use of water-efficient equipment, regular maintenance to fix leaks, and awareness campaigns for staff on water-saving practices.

Backup Power Supply: Ensure that the water supply system, including pumps and purification systems, has a reliable backup power supply to prevent disruptions during power outages.

7.3 Protocols for Emergency Water Delivery

Pre-Emergency Planning: Identify potential water sources in and around the healthcare facility. Establish agreements with local water suppliers for emergency water delivery. Develop a comprehensive emergency water plan, including alternative water sources, transportation methods, and distribution points.

Water Storage and Reserves: Ensure that the healthcare facility has adequate on-site water storage capacity. Regularly inspect and maintain water storage tanks to prevent contamination. Establish water reserves that can sustain the facility for a specified period during emergencies.

Emergency Water Delivery Team: Designate a team responsible for coordinating and overseeing emergency water delivery. Train staff on the procedures for receiving, distributing, and rationing water during emergencies.

Water Quality Monitoring: Implement a water quality monitoring system to ensure that delivered water meets health and safety standards. Have water testing kits available to quickly assess the quality of delivered water.

Transportation Logistics: Identify and secure suitable vehicles for transporting water to the healthcare facility. Establish efficient routes for water delivery, considering accessibility and safety. Coordinate with local authorities to ensure safe passage for water transport vehicles during emergencies.

Distribution Points: Identify designated areas within the healthcare facility for water distribution. Implement a fair and efficient distribution system, considering the needs of patients, staff, and essential operations.

Rationing and Conservation: Develop a rationing plan to prioritize water usage for critical functions. Educate staff on water conservation practices and the importance of using water judiciously during emergencies.

Alternative Water Sources: Identify alternative water sources, such as on-site wells or rainwater harvesting systems. Develop procedures for safely extracting and treating water from alternative sources.

8. Sanitation and Hygiene Protocols

Healthcare facilities (HCFs) play a critical role in responding to emergencies, and ensuring proper sanitation and hygiene protocols is essential to prevent the spread of diseases and maintain a safe healthcare environment. It's important to note that specific protocols may vary based on the nature of the emergency, whether it's a natural disaster, disease outbreak, or another crisis. Local health authorities and international organizations often collaborate to develop and implement appropriate guidelines. Here are some general sanitation and hygiene protocols that might be considered during emergencies in healthcare facilities:

8.1 Hygiene Standards for Water Handling

Source Water Protection: Ensure that the water source is safe and protected from contamination. Regularly test water sources for quality and purity. Establish contingency plans for alternative water sources in case the primary source is compromised.

Water Storage and Distribution: Use clean, food-grade containers for water storage. Regularly clean and disinfect water storage tanks and containers to prevent the growth of harmful microorganisms. Implement a systematic distribution system to avoid cross-contamination.

Water Treatment: If the water source is questionable, implement appropriate water treatment methods such as chlorination, filtration, or boiling. Regularly monitor and test the treated water to ensure it meets health standards.

Hand Hygiene: Promote and enforce proper hand hygiene practices among healthcare workers, patients, and visitors. Provide access to handwashing stations with soap and clean water or alcohol-based hand sanitizers.

Personal Protective Equipment (PPE): Ensure that healthcare workers handling water wear appropriate PPE, such as gloves, to prevent contamination. Provide training on the correct use and disposal of PPE.

Waste Management: Establish proper waste disposal systems for used water containers and other waste generated during water handling. Train staff on the safe disposal of water-related waste materials.

8.2 Guidelines for Disinfection and Sterilization

Emergency Water Treatment: If there's a risk of water supply contamination, implement emergency water treatment measures. Consider using portable water treatment systems or disinfection methods such as chlorination to ensure the supply of safe water.

Water Conservation: Implement water conservation measures to reduce the strain on the water supply system. Educate staff on minimizing water usage during procedures and other healthcare activities.

Prioritize Sterilization: Prioritize the use of sterile equipment and instruments, especially during emergency situations. Ensure that sterilization equipment is functioning properly, and routine maintenance is performed.

Alternate Sterilization Methods: If traditional sterilization methods are not feasible due to water shortages, consider alternative methods such as chemical sterilization or low-temperature sterilization technologies.

Reuse Policies: Develop and communicate policies for the safe reuse of certain medical equipment and instruments when necessary. Implement strict protocols for cleaning and disinfecting reusable items to prevent infections.

8.3 Waste Management Protocols

Healthcare facilities (HCFs) play a critical role in managing waste, especially during emergencies, to ensure the safety of patients, healthcare workers, and the environment. Proper waste management protocols are essential to prevent the spread of infections and minimize environmental impact. Here are some key waste management protocols for healthcare facilities during emergencies:

Waste Segregation: Implement a waste segregation system to categorize waste into different types (e.g., infectious, non-infectious, hazardous). Provide clearly labeled bins for different types of waste. Train healthcare workers to segregate waste at the source.

Personal Protective Equipment (PPE) Disposal: Establish a separate collection system for the disposal of used PPE. Clearly mark bins for used gloves, masks, gowns, and other disposable protective gear. Ensure proper disposal procedures for contaminated PPE to prevent the spread of infections.

Infectious Waste Management: Designate specific containers for infectious waste, such as red bags or containers labeled with biohazard symbols. Use leak-proof and puncture-resistant containers for the collection of infectious waste. Ensure that infectious waste is treated and disposed of according to local regulations.

Hazardous Waste Management: Identify and segregate hazardous waste, such as chemicals or pharmaceuticals, in designated containers. Follow proper disposal procedures for hazardous materials in accordance with local regulations.
Temporary Storage Facilities: Designate secure and well-ventilated areas for temporary storage of waste during emergencies. Ensure that storage facilities are easily accessible to waste management personnel and equipped to prevent environmental contamination.

Regular Waste Collection: Establish a schedule for regular waste collection and disposal. Coordinate with waste management services to ensure timely and safe removal of waste.

Environmental Impact Considerations: Implement environmentally friendly waste management practices whenever possible. Consider the environmental impact of waste disposal methods and opt for sustainable options.

9. Monitoring and Evaluation System

9.1 Monitoring Tools and Metrics for Water Distribution

Monitoring Tools	Metrics to Monitor
Flow Meters: • Purpose: Measure the rate of water flow in pipes.	Water Consumption Rates: • Metric: Gallons or liters per unit time.

• Use: Ensure that an adequate volume of water is reaching various points in the facility. • Benefits: Detect leaks, monitor water consumption, and optimize distribution.	• Purpose: Track the overall usage and identify any sudden spikes or drops.
Pressure Sensors: • Purpose: Monitor water pressure in the distribution system. • Use: Ensure consistent pressure for proper functioning of medical equipment and other facilities. • Benefits: Identify issues like blockages or leaks affecting pressure, prevent damage to equipment.	Pressure Levels: • Metric: PSI (Pounds per Square Inch) or kPa. • Purpose: Ensure consistent pressure throughout the facility.
Water Quality Testing Kits: • Purpose: Assess the microbial and chemical quality of water. • Use: Ensure that water meets health standards for patient safety and medical equipment use. • Benefits: Early detection of contamination, ensuring safe water for consumption and medical procedures.	Water Quality Parameters: • Metrics: Microbial content (e.g., presence of coliforms), chemical parameters (e.g., chlorine levels). • Purpose: Ensure that water meets health standards.
Telemetry Systems: • Purpose: Transmit real-time data on water system parameters. • Use: Enable remote monitoring and control of the water distribution system. • Benefits: Timely response to issues, efficient management during emergencies.	Distribution Efficiency: • Metric: Percentage of water delivered to intended locations. • Purpose: Evaluate the effectiveness of the distribution network.
Remote Sensing Technologies: • Purpose: Monitor water sources, storage, and distribution from a distance. • Use: Provide insights into the overall water distribution network. • Benefits: Rapid assessment of the system's status, especially in challenging situations.	Response Time to Issues: • Metric: Time taken to detect and respond to leaks or other issues. • Purpose: Measure the efficiency of emergency response.
	Resource Utilization: • Metric: Energy consumption for water distribution. • Purpose: Optimize energy use for sustainability during emergencies.
	Storage Levels: • Metric: Percentage of water storage capacity utilized. • Purpose: Ensure that there is an adequate reserve for critical needs.

Regularly monitoring these tools and metrics will enable healthcare facilities to proactively manage their water distribution systems during emergencies, ensuring the continuous availability of clean and safe water for patient care and facility operations.

9.2 Regular Evaluation of the Water Supply Plan

Establish Evaluation Criteria: Define clear criteria for evaluating the water supply plan. This may include factors such as water availability, storage capacity, distribution systems, emergency response protocols, and the ability to meet the facility's needs during various types of emergencies.

Equipment Maintenance and Upkeep: Regularly inspect and maintain water-related equipment, such as pumps, storage tanks, and purification systems. Ensure that all equipment is in good working condition and can be quickly activated during emergencies.

Staff Training: Provide ongoing training to staff members on the implementation of the water supply plan. This includes training on emergency response procedures, the use of water-related equipment, and communication protocols.

Regular Audits: Conduct regular audits of the water supply plan to assess its compliance with regulatory requirements and industry standards. Use these audits to identify areas for improvement and ensure that the plan is up-to-date.

Continuous Improvement: Establish a process for continuous improvement based on the findings from evaluations, drills, and audits. Update the water supply plan accordingly and incorporate lessons learned from each evaluation cycle.

9.3 Continuous Improvement Strategies

Continuous improvement strategies for water distribution plans in healthcare facilities (HCFs) during emergencies are crucial to ensure the availability of safe and sufficient water for patient care, sanitation, and other essential needs. Here are some strategies to enhance and continually improve water distribution plans in HCFs:

Regular Training and Drills: Conduct regular training sessions for staff involved in water distribution, emphasizing emergency procedures. Perform drills to simulate emergency scenarios, including water shortages, to test the effectiveness of the plan.

Risk Assessment and Planning: Conduct a thorough risk assessment to identify potential vulnerabilities in the water supply system. Develop contingency plans for various emergency scenarios, considering factors such as natural disasters, infrastructure failures, or contamination events.

Collaboration with Local Authorities: Collaborate with local water authorities and emergency management agencies to stay informed about potential risks and to coordinate response efforts.
Establish clear communication channels with local authorities for real-time updates during emergencies.

Alternative Water Sources: Identify and pre-establish agreements with alternative water sources, such as nearby water suppliers, to ensure a backup supply during emergencies.
Consider on-site water storage solutions, like water tanks, to provide a reserve in case of disruptions.

Water Quality Monitoring: Implement a robust water quality monitoring system to ensure that the water distributed meets health and safety standards. Establish protocols for regular testing and quick response to any water quality issues.

Communication Plans: Develop and maintain communication plans to keep staff, patients, and stakeholders informed during water emergencies. Use multiple communication channels, including internal messaging systems, public announcements, and social media, to disseminate information.

Inventory and Equipment Checks: Regularly check and maintain water distribution equipment, such as pumps, pipes, and purification systems. Keep an updated inventory of water-related equipment and supplies to ensure readiness.

Community Engagement: Involve the local community in emergency preparedness efforts, educating them on the importance of water conservation and emergency response. Establish community partnerships to facilitate mutual support during emergencies.

Documentation and Evaluation: Document all aspects of the water distribution plan, including procedures, contact information, and equipment specifications. Conduct regular evaluations and reviews of the plan to identify areas for improvement and update it accordingly.

Feedback Mechanism: Establish a feedback mechanism to gather input from staff and stakeholders after each emergency or drill, allowing for continuous improvement. Use feedback to adjust and refine the water distribution plan based on real-world experiences.

10. Coordination with Local Authorities and NGOs

10.1 Collaborative Initiatives with Local Government Agencies

Local Government Agencies: Identify and engage with relevant local government departments responsible for emergency management, public health, and water supply. This may include the emergency management agency, public health department, and water and sanitation department.

Establish Communication Channels: Set up regular meetings with key stakeholders to discuss water supply distribution plans. Ensure representation from both healthcare facility management and local government agencies.

Communication Platforms: Utilize digital platforms for communication and document sharing. Create a dedicated communication channel or group to facilitate quick information exchange.

Develop Emergency Response Protocols: Collaboratively develop SOPs for water supply distribution during emergencies. Clearly define roles and responsibilities of each stakeholder.

Resource Mobilization: i. Emergency Supplies: Collaborate on maintaining a stockpile of emergency water supply equipment and resources. Establish protocols for rapid deployment of resources during emergencies. ii. Funding Mechanisms: Work together to identify and secure funding sources for emergency water supply initiatives. Explore public-private partnerships for additional support.

Information Sharing: i. Data Sharing: Establish a system for sharing real-time data on water supply status and needs. Implement technologies for efficient data exchange, such as shared databases or GIS systems. ii. Public Awareness: Collaborate on public awareness campaigns to inform the community about emergency water supply plans. Provide guidance on water conservation during emergencies.

Legal and Regulatory Alignment: Ensure that the water supply distribution plans align with local laws and regulations. Seek necessary approvals and endorsements from relevant authorities.

10.2 Partnerships with NGOs for Resource Mobilization

Identify Relevant NGOs: Research and identify NGOs that have a focus on water, healthcare, and emergency response. Consider NGOs with a track record of successful partnerships or projects in the healthcare sector.

Understand NGO Objectives and Priorities: Gain an understanding of the mission, objectives, and priorities of potential partner NGOs. Identify NGOs whose goals align with your water supply distribution plan in healthcare facilities during emergencies.

Develop a Comprehensive Plan: Create a detailed plan outlining your water supply distribution strategy during emergencies in healthcare facilities. Clearly define the role of the NGO in supporting the plan.

Communicate the Impact: Clearly communicate the potential impact of your water supply distribution plan on healthcare facilities and the communities they serve. Highlight the positive outcomes and benefits that could result from the partnership.

Highlight the Urgency: Emphasize the urgency of the situation during emergencies, underlining the critical need for immediate action in ensuring water supply in healthcare facilities.

Engage in Dialogue: Reach out to key contacts within the identified NGOs for initial discussions. Schedule meetings or presentations to discuss your plan, the emergency scenarios you're preparing for, and the specific support you're seeking.

Demonstrate Alignment with NGO Goals: Showcase how your water supply distribution plan aligns with the mission and goals of the NGO. Emphasize the shared values and objectives related to emergency response and healthcare.

Define Partnership Terms: Clearly define the terms of the partnership, including roles, responsibilities, and expectations. Discuss resource contributions, whether they be financial, in-kind donations, or manpower.

Develop a Memorandum of Understanding (MOU): Draft a formal MOU that outlines the terms and conditions of the partnership. Include details such as the scope of work, responsibilities, duration of the partnership, and any financial or material commitments.

Build a Relationship: Cultivate an ongoing relationship with the NGO. Regularly update them on the progress of the water supply distribution plan and any positive outcomes resulting from their support.

Recognition and Reporting: Acknowledge and recognize the NGO's contributions publicly. Provide regular reports on the impact of their support, including success stories and lessons learned.

Evaluate and Adjust: Periodically evaluate the effectiveness of the partnership. Be open to feedback, and make adjustments as necessary to improve collaboration and the overall success of the water supply distribution plan.

11. Conclusion

11.1 Summary of Key Points

Water supply and sanitation facilities distribution plans for Healthcare Facilities (HCFs) during emergencies are crucial for ensuring the well-being of patients and healthcare providers. Here are key points to consider in such plans:

a) Emergency Water Supply: Ensure a reliable and continuous water supply during emergencies, considering backup sources such as water storage tanks, mobile water units, or water treatment facilities.

b) Emergency Sanitation Facilities: Provide adequate and functional sanitation facilities within healthcare facilities, including toilets and handwashing stations. Ensure proper waste management to prevent the spread of infections.

c) Coordination and Communication: Establish effective communication channels and coordination mechanisms between relevant stakeholders, including healthcare facilities, government agencies, and humanitarian organizations.

d) Capacity Building: Train healthcare facility staff on emergency response procedures, including the operation and maintenance of water and sanitation facilities. Conduct drills and simulations to ensure readiness.

e) Stockpiling of Supplies: Maintain a stockpile of essential water and sanitation supplies, such as water purification tablets, hygiene kits, and sanitation equipment.

f) Accessibility and Inclusivity: Ensure that water and sanitation facilities are accessible to all, including people with disabilities and those with special needs.

g) Monitoring and Evaluation: Implement a monitoring and evaluation system to assess the effectiveness of the water supply and sanitation facilities distribution plan. Make necessary adjustments based on feedback and changing circumstances.

h) Community Engagement: Involve the local community in the planning and implementation of water and sanitation initiatives. Educate the community on the importance of hygiene practices and the proper use of facilities.

i) Sustainability: Develop plans for the long-term sustainability of water and sanitation facilities, considering post-emergency recovery and reconstruction.

j) Legal and Regulatory Compliance: Ensure that the distribution plan adheres to relevant legal and regulatory standards for water and sanitation facilities in healthcare settings.

k) Flexibility and Adaptability: Design the plan to be flexible and adaptable to different emergency scenarios, considering variations in scale and nature of emergencies.