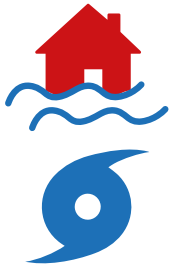


Preparing Health Centers for Flood and Typhoon Events



Flood and Typhoon Readiness Actions For Administrators

Purpose

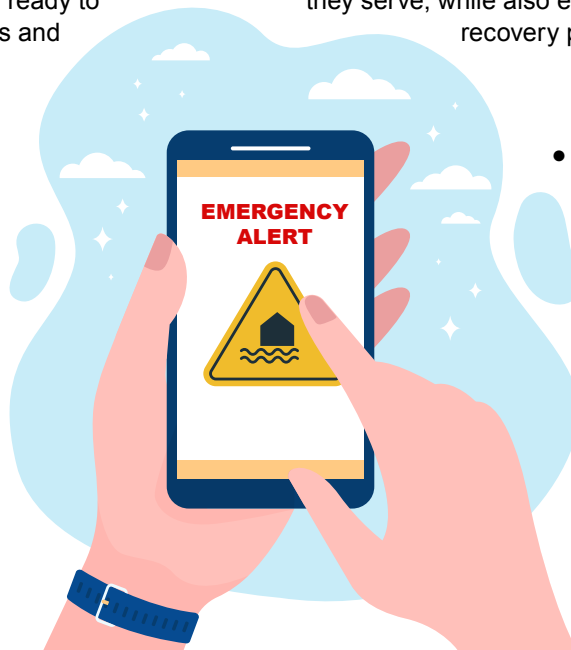
Floods and typhoons can pose significant risks to the safety, health, and well-being of patients, staff, and the community served by health care facilities. As climate change continues to increase the frequency and intensity of extreme precipitation events, it is essential for clinics to have a comprehensive plan in place to prepare for, respond to, and recover from flood events.

This Flood and Typhoon Readiness Actions document provides a step-by-step guide for facility administrators and/or the designated Preparedness Lead to ensure their clinics or health centers are ready to protect the health of their patients and staff during periods of flooding.

The plan is divided into three sections: advisory/watch, during the event, and recovery. These sections integrate both typhoon and flooding responses since these hazards often occur together and require similar preparedness actions. The actions and checklist items cover critical areas such as facility preparation, communication plans, patient and staff safety, and post-event recovery. By following the guidance outlined in this document, health care facilities can minimize the negative impacts of natural disasters on their operations and the health of the communities they serve, while also ensuring a swift and effective recovery process.

Tropical Cyclone / Flooding is Likely (Several Days Out – Active Advisory or Watch)

- Monitor PAGASA and emergency alerts for real-time updates. Review and activate facility emergency plans, ensuring all staff are informed of their roles and responsibilities.



- If the facility is at risk of flooding or damage from winds, or it will be dangerous for patients to get to your facility, consider canceling/postponing non-urgent patient appointments and sending staff home early.
- Be ready to close the facility and evacuate staff immediately if necessary. Identify safe evacuation routes that avoid flooded

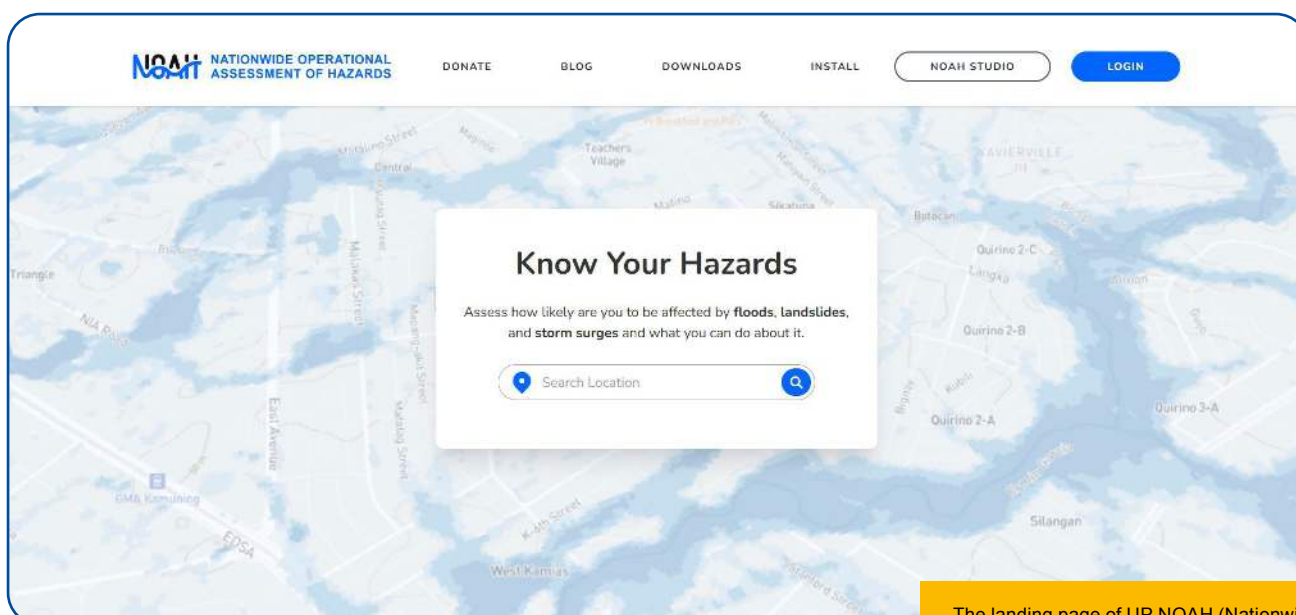
areas and are free from dangerous debris by coordinating with local emergency responders.

- Essential equipment, supplies, documents, and medications should be stored on a higher ground or in waterproof containers – away from windows and flood-prone areas.
- Clear exterior drains and gutters, lock and seal low-lying windows, tie down any outside furniture or decorations that may blow away, and have a water pump available if the facility is prone to basement or ground-level flooding.
- If a rainfall warning is issued, use sandbags and water barriers to prevent water from entering the facility, following guidance from local emergency management.
- Ensure emergency supplies, such as sandbags, water pumps, soap, and first aid kits, are readily available.
- Keep staff informed about the situation and reinforce safety measures, including avoiding floodwaters and seeking shelter during strong winds.
- Communicate with patients about potential service disruptions, provide safety guidance, and reschedule canceled appointments.

- Coordinate with local emergency management officials, public health officials, health care facilities, and service providers to share resources and information.
- Contact the local **Disaster Risk Reduction (DRR) Office** to arrange safe evacuation of patients and staff if needed.

Typhoon / Flood Warning or Facility Flooding

- Ensure the safety of all patients and staff and evacuate the facility if necessary. If your facility is likely to flood, seek a higher ground before flooding occurs, however, if possible, you are trapped, retreat to a higher-level of the facility or onto the roof.
- If possible, monitor the water levels and the condition of the facility's infrastructure, such as electrical systems and water supply.
- Maintain communication with staff, patients, and local emergency response organizations or agencies.
- If the facility is closed, consider transferring the main phone line to an on-call medical provider to answer patient questions.



The landing page of UP NOAH (Nationwide Operational Assessment of Hazards). This website allows users to check how an area is susceptible to weather-related extreme events, such as floods, landslides, storm surges, etc.

After the Typhoon or Flood

- After the typhoon or flood, please refer to the “Facility Repair and Re-Entry” on page 10 for guidance.
- After the risk of hazards has decreased, review and update your plans through a formal debrief and after-action review process.

NOTES:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Resilient Healthcare Facility



Flood Communications Templates

For Administrators

Purpose

Effective communication is crucial for health centers and clinics to ensure the safety and well-being of their patients and staff during floods. This document

provides guidance and sample messages that can be used to disseminate important information and alerts before, during, and after floods.

When Flooding is Anticipated (Flood Advisory or Watch)

Recorded Phone Message or Email – Preparedness and Staying Informed



Messages

3 mins ago

A [typhoon / tropical storm / tropical depression] is expected in [impacted region]. You can read more about this alert on the PAGASA website (<https://www.pagasa.dost.gov.ph/#>), or can learn more from local authorities and media. You can look up risk for flooding at your home's location at noah.up.edu.ph. This NOAH site provides flood maps for your address. NDRRMC, CDRRMC/MDRRMC and the Weather Bureau (PAGASA) are more likely to provide accurate up-to-date information regarding evacuation statuses, protective action recommendations, and broad public guidance for facilities and individuals.



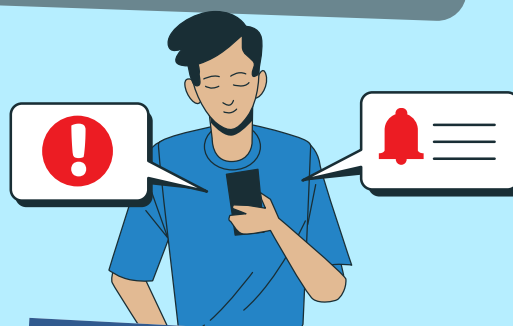
Messages

3 mins ago

You can check for Weather Advisory issued by PAGASA on Rainfall Alert using your phone, computer, or local news station. You can get more information on the website <https://www.pagasa.dost.gov.ph/>.

In case you need to evacuate, keep a kit of emergency supplies ready so you can easily grab and go.

[Name of RHU] will remain [open/closed]. If open, specify hours and services provided.



New Messages

To: jdelacruz@yahoo.com

cc | bcc

Subject: **WEATHER ADVISORY**

It is important to know the difference between a flood warning and a flood watch.

Flood warning is issued when flooding is happening or will happen soon. Some roads will be flooded.

Flood watch is issued when flooding is possible. Stay tuned to radio/TV/news media and be ready to seek higher ground.

Send

Draft



Floods, typhoons, and tropical storms create conditions where injuries are more common. Know the risks to your health from floods and how to minimize them:



Turn around when there is water on the road – As little as 15 cm of water can cause you to lose control of your vehicle.



Power outages – If you use electric medical devices, you will need to have a backup power plan in case you lose power. Refer to “Health Center Power Outage Preparedness and Response” on page 12.



Infections – Standing water contains bacteria and viruses that can cause disease. It can also serve as a breeding ground for disease-transmitting mosquitoes.



Poor water quality – After severe storms, water may not be safe to drink, especially water from private wells. Listen for boil water advisories. Throw away any food and bottled water that may have contracted floodwater.



Mold – Molds can grow after flooding, which can then cause coughs, congestion, and headaches as well as asthma flares.



Electrocution – Strong winds can knock down or damage power lines. DO NOT touch any downed power lines or wade into standing water that power lines may have fallen into because this can electrocute you.



Turn off the power to your appliances at the circuit breaker or fuse box if your home has flooded because wet appliances may also pose an electrocution risk.

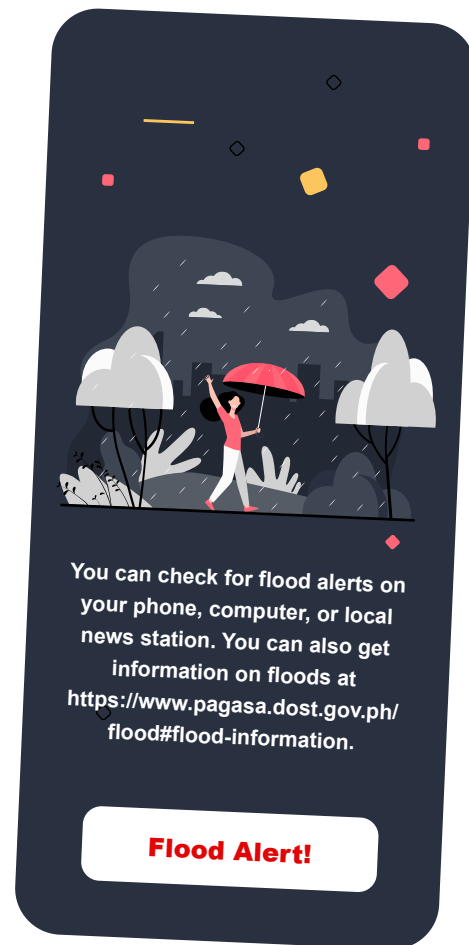
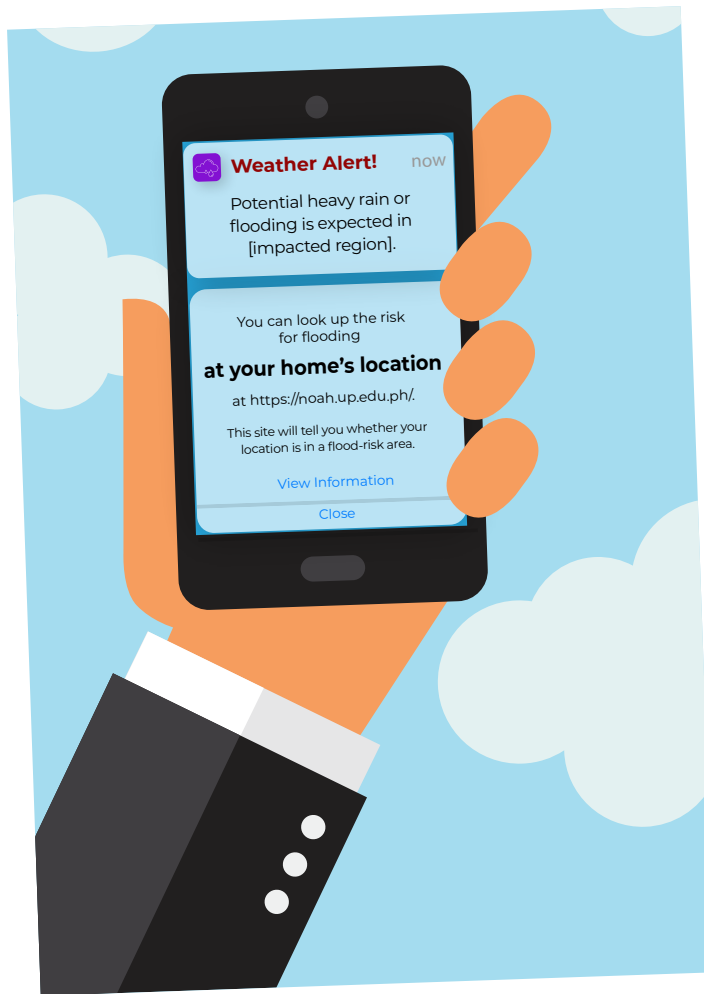


Falling trees, utility poles, and buildings – They can become unstable and fall on people and property.




Carbon monoxide exposure – If you lose power, do not cook by burning fuels such as wood or propane indoors. Additionally, never use generators indoors or near open windows. These can lead to carbon monoxide poisoning.

Social Media Post or Text Messages – Preparedness (1-5 Days in Advance)




Social Media Post or Text Messages – Prepare for Evacuation



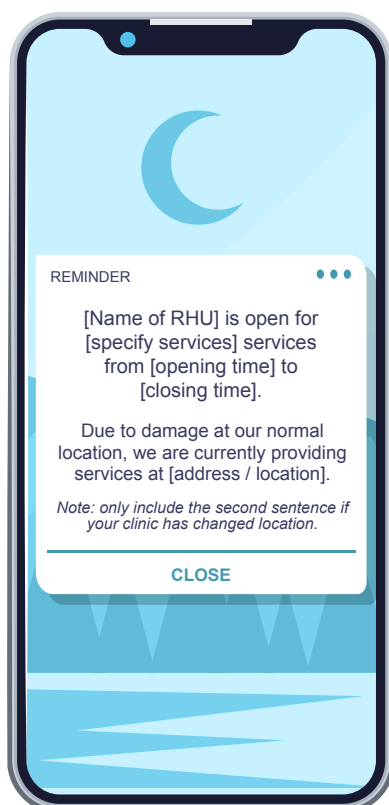
A typhoon is forecasted for [impacted region]. Pay attention to local media outlets for updates on the typhoon. Evacuate when instructed. Turn off gas and water supplies before you evacuate. Once you are in a safe building, stay inside until you hear or see an official message that the typhoon is over. Stay away from windows because you can get hurt by pieces of broken glass or flying debris. Stay in a room with no windows or go inside a closet. Keep your emergency supply kit ready to go. Remember to bring:

- A Go Bag with essential items
- All medications plus an extra stock for seven days
- Medical paperwork, including a list of all conditions, medications, and dosages taken
- Charged essential medical equipment and back-up batteries
- All assistive devices including eyeglasses, dentures, hearing aids, and communication devices

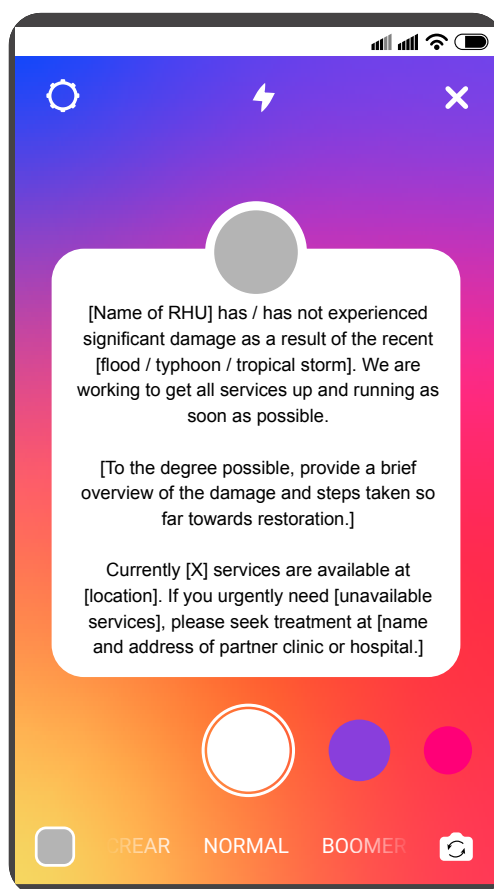
During a Flood, Typhoon, or Tropical Storm

Recorded Phone Message or Email – Prepare for Evacuation

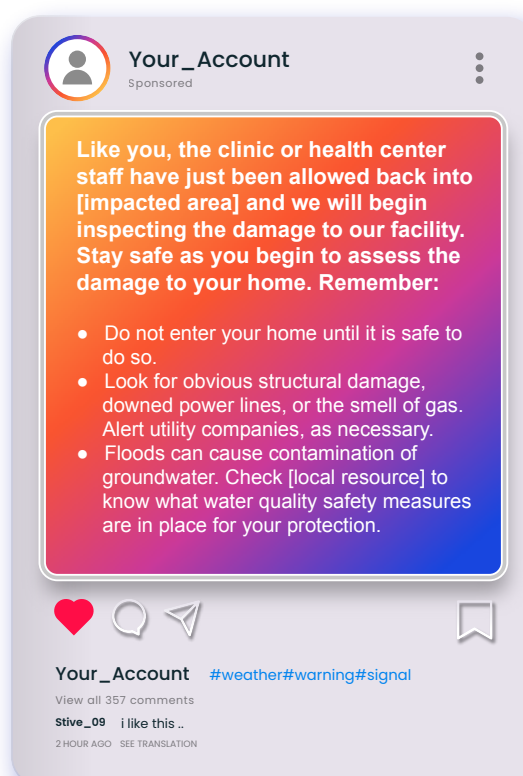


After a Flood or Typhoon

Recorded Phone Message or Email – Clinic Status



Social Media Post or Text Messages – Clinic Status and Safety



NOTES:

[illegible]

Appendices for Administrators

Appendix A

Facility Repair and Re-Entry

Purpose

Before returning to your clinic, ensure the appropriate authorities have said it is safe to return. If the building has been damaged by a storm or flooding, do not enter the building until a proper safety inspection has been completed to ensure structural integrity. If repairs are needed, consider how your clinic will communicate with staff, patients, and stakeholders to keep them informed about the status of the building and any changes to normal operations.

Considerations for High Wind:

- Structural integrity and inspection should include:
 - Roof inspection
 - Load-bearing beams and walls
 - Structural metals
 - Windows
 - Interior walls and framing
 - Exterior equipment systems (HVAC, solar, etc.)
 - Cracks or gaps in the building envelope (windows, doors, and utility penetrations)

Considerations for Facility Flooding:

- Excess water removal and drying time.
- Mold remediation including minimizing spore dispersion during the cleaning process.
- Determining what medical and office equipment can be salvaged.
 - Has all furniture and equipment been inspected, repaired, and disinfected?
 - Has porous furniture that was wet been discarded?
 - Were mattresses discarded if they were underwater or wet?
 - Have all linens been laundered?
 - Have medications and supplies that were damaged or contaminated been discarded?
 - Are medical gas and suction systems including air lines operable and cleaned?
 - Have ice machines been flushed, cleaned, and disinfected?
 - Structural integrity (In addition to the considerations for high winds):
 - Cracks in the foundation (new or widening)
 - The structure dislodged from the foundation
 - Flooring (spongy or newly uneven/wavy materials)
 - Requirements prior to re-opening:
 - Potable water
 - Functional sewage system
 - Adequate waste and medical waste disposal system
 - Certification of occupancy

General Safety Considerations and Assessment Needs:

Trained professionals should do assessments of infrastructure and critical equipment. This includes an assessment of the following systems:

- Structural integrity and missing structural items
 - Assessment of water damage, hidden moisture, and signs of mold growth
- Electrical system damage, including high voltage, insulation, and power integrity
- Water distribution system damage
- Sewer system damage
- Fire emergency systems damage
- HVAC system damage including all ductwork and filtration systems
- Medical waste and sharps disposal system
- Medical gas system damage
- Properly cleaned, disinfected, and calibrated medical equipment
- Hazardous chemical storage and/or disposal system

Facility Repair and Re-entry Checklist

Done	Task	Assigned to
	Only return to the area when it is deemed safe by local emergency management or appropriate authorities.	
	When it is safe to return, inspect the clinic from the outside to look for tilting or displacement of the structure, cracks in the foundation, and any buckling or sagging of the roof or flooring (if visible from the outside).	
	Look for heavily damaged trees that could fall and harm people or structures. Contact a tree removal company for management.	
	Look for downed or damaged power and communications lines. Contact utility companies if observed.	
	Check for the presence of snakes, rodents, and other animals inside the facility.	
	Check for the smell of natural gas. <ul style="list-style-type: none"> • Contact the gas company if observed. • Shut off the gas supply if it is outside the building. 	
	Once an expert has deemed the building safe to enter, take protective measures such as wearing thick-soled shoes, heavy work gloves, long pants, and a long-sleeved shirt. If there is the possibility of mold, don a fit-tested N-95 mask before entering the building. Staff with respiratory conditions (e.g., asthma) or immunosuppression should not enter buildings with water leaks or mold growth.	
	Check the functionality of the clinic including: <ul style="list-style-type: none"> • Exam rooms • Office furniture • Computer systems • Refrigeration systems • Pharmacy supply and equipment • If the clinic uses paper documentation, check for damage to patient and pharmacy records. 	
	Ensure any private patient data and pharmaceuticals are well secured. They may need to be moved to a secondary site.	
	Call the clinic's pre-identified assessment team(s) to start the inspection of the building. The results of this inspection will determine what steps to take for building restoration and should at a minimum address all General Safety Considerations listed above.	
	Contact the clinic's pre-identified restoration team to prioritize and begin work.	
	Work with the assessment and restoration teams to identify if some sections of the clinic may be able to open before others. This will help with planning a staged re-opening.	
	Document all damage with photographs and written descriptions for insurance claims and repair references.	
	Keep detailed records of repair costs, contractor invoices, and any communications with insurance providers.	

Adapted from guidance from the [CDC](#), [FEMA](#), [AIHA](#), and [Rytech Restoration](#).

Appendix B

Health Center Power Outage Preparedness and Response

Purpose

This document provides recommendations for policies and procedures in the event of a power outage that can be included in a facility's emergency plan or in a standalone power outage plan. These plans can help ensure the safety of staff and patients in the event of a power outage. Improving clinic resilience may have the added benefit of improving clinic sustainability and cost-savings.

Power Outage Preparedness

1. Develop policies and procedures for a) periods of time when a power outage occurs, and clinic operations can rely on backup power, and b) situations when backup power is unavailable or fails.
 - a. Responses to power failures may include limiting services, communicating operational changes to staff and patients, and assisting high-risk patients out of the facility.
2. Have an inventory of what equipment is and is not powered when using a generator or battery.
 - a. Have equipment clearly marked, including power outlets.
 - b. Update inventory when new equipment is purchased, or facility electrical upgrades occur.
3. Explore partnerships with local hospitals for short-term refrigeration of vaccines and medications in case of a power outage.
4. Implement policies to reduce energy demand during normal operations, which translates into less backup energy needs during outages:
 - a. Install a smart thermostat.
 - b. Install motion sensor lights.
 - c. Use LED bulbs throughout the facility (LEDs use less electricity and produce less heat).
 - d. Conduct an energy audit to identify other opportunities for energy savings.
5. Develop a purchasing schedule policy to procure energy-efficient equipment to limit the strain on generators during power outages.
6. Understand the capability of your backup generators, including the anticipated length of time they can run with various electrical loads with the current amount of fuel.
 - a. Create an easily understood comparison chart of electrical load to the length of time the generator can function, with examples of equipment, to improve the duration of backup power.
7. Identify staff members to oversee the implementation of each of these policies and ensure they are followed through.

Partnerships and Vendors

Contacting Partners

Establish relationships with power-related companies, such as electrical utility companies, generator service companies, electricians, and others. Plan for at least annual communication with these companies to check on the status of any verbal or written agreements, especially those that pertain to power outages. All formal business relationships such as with vendors should have written agreements. Create agreements with partners to receive emergency maintenance in case alternative power sources fail during an extreme heat event.

1. **Utility Companies:** Contact your power company to identify if your clinic is listed as a priority location during a power outage. Priority locations may receive preferential access to electricity during system outages or have electricity restored earlier.

- a. Also, inquire as to whether notice can be given in advance of planned outages and provide them with point of contact information for your clinic.
- 2. Electricians and Contractors:** Establish a relationship with an electrical or contractor company to have the facility generator regularly inspected and maintained to prevent deterioration.
- 3. Rental Companies:** Work with rental companies and develop partnerships to ensure the clinic can obtain extra generators and equipment in case the generator fails to operate during power outage due to flood and typhoon.
- 4. Community Organizations or Businesses:** Work with local businesses, organizations, or health centers to identify backup cold chain options in case the supply gets too warm.
- 5. Staff members:** Identify who will oversee the implementation of each of these policies and ensure they are followed through.

Emergency Power Sources

Emergency Power Options

1. Work with an electrician to receive an evaluation of the possibility of installing generators or backup batteries and prices for the installation. An evaluation may be able to identify the right size of generators or batteries needed to run a portion of the facility or the entire facility, along with the price of labor required to complete the installation.
- 2. Generators**
 - a. Gas/Diesel generators are the most affordable backup power source available. These can range from portable generators to industrial generators which can be installed into the ground and configured to turn on when the power grid fails.
 - i. Benefits: These are generally less expensive up-front and may be more reliable for large facilities.
 - ii. Drawbacks: Requires purchase and storage of combustible fuels, requires regular maintenance and refueling during extended power outages, and contributes to local air pollution.
 - b. Solar power systems are more expensive but more environmentally friendly, do not contribute to local air pollution, and can be more cost-effective in the long term. These can also range from small portable systems to larger stationary systems with panels and energy storage.
 - i. Benefits: These do not rely on fuel sources during prolonged power outages, and they do not contribute to local air pollution. These can often be used during non-emergency times to reduce energy costs.
 - ii. Drawbacks: More expensive up-front than fuel generators. Powering a full facility may require more space for solar panels than is available on a facility's roof.
- 3. Battery Storage**

Battery storage is necessary for solar power systems to be practical during power outages. Backup batteries can also be used without solar by charging batteries from grid power, however, during outages, recharging these systems will be unlikely until grid power is restored. While battery storage can be expensive up-front, the size and carrying capacity of battery systems are increasing while manufacturing costs have been decreasing over time.

 - a. Benefits: Quieter than a generator. Can be stationary or portable, does not rely on purchasing fuel, and does not emit pollutants.
 - b. Drawbacks: Significant expense up front, especially to power a full facility.
- 4. Hybrid Systems**
 - a. A hybrid solar, battery, and fuel generator system may be a cost-effective way to ensure power to essential equipment.

Procurement

1. Identify a purchasing schedule to buy gas/diesel generators (or replace old ones as they become outdated or inefficient), backup battery storage, and sustainable energy such as solar.
 - a. Create policies to set aside funds in a reasonable period for each large purchase over time.
 - b. Consider guidelines for generator specifics (such as energy output, size, weight, and other factors that could be critical to effectively powering your clinic).
2. Create policies for generator placement to encompass safety, such as away from windows, doors, air conditioning units, or any air intake for the facility to prevent carbon monoxide and other pollution from getting into the facility if it is a gas or diesel generator.
3. Create policies for generator placement to ensure the generator is easily accessible for maintenance but also remains cool, receives adequate airflow during flood and typhoon, and prevents carbon monoxide poisoning to patients and staff in the area.
4. Identify staff members to oversee the implementation of each of these policies and ensure they are followed through.

Upkeep

1. Schedule annual maintenance and inspections for the clinic's emergency power sources.
 - a. Maintenance and upkeep are critical to ensuring equipment will turn on and run properly when needed.
 - b. Schedule maintenance during the off-season to save on costs.
2. Schedule a regular cycle to ensure the clinic's generator is running properly and continues operating.
 - a. It is optimal to run a generator monthly for at least 30 minutes to keep it functioning smoothly.
3. Identify staff members to oversee the implementation of each of these policies and ensure they are followed through.

Refueling

1. Create a refueling schedule to ensure the generator(s) is ready to operate when least expected.
2. Identify personnel and/or vendors with the task of refueling the generator(s) and establishing a schedule to refuel during emergency operations.
3. Fuel Sources: Establish an agreement with suppliers to ensure fuel can be delivered or picked up during emergency operations or so fuel supplies can be held for your clinic's needs.
4. Identify staff members to oversee the implementation of each of these policies and ensure they are followed through.

During a Power Outage

1. Implement policies to reduce energy demand, especially while on backup power.
 - a. Set thermostats to 24°C.
 - b. Install motion sensor lights.
 - c. Use LED bulbs throughout the facility (use less electricity and produce less heat).
 - d. Turn off and unplug all computers and monitors that are not in use.
 - e. Unplug appliances such as microwaves and coffeemakers.