



BE Prepared!

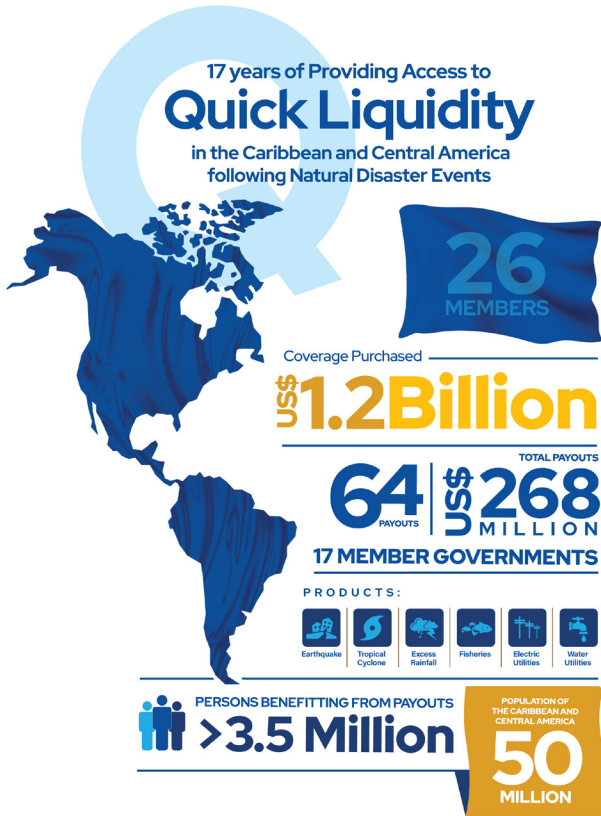
Earthquake Tips For Households, Schools,
Communities And Businesses





About CCRIF SPC

CCRIF SPC (formerly the Caribbean Catastrophe Risk Insurance Facility) is the world's first multi-country, multi-peril risk pool based on parametric insurance. CCRIF provides parametric catastrophe insurance for Caribbean and Central American governments, and for electric and water utility companies. The Facility operates as a development insurance company – the goods and services it provides are designed to enhance the overall development prospects of its members.



The Multi-Hazard Environment of Latin America and the Caribbean

Latin America and the Caribbean is the second most disaster-prone region in the world with about 190 million people affected by 1,534 disasters between 2000 and 2022¹. The countries of the Caribbean and Latin America can be described as existing in a multi-hazard environment and can be exposed to a myriad of natural hazards, man-made hazards, and biological hazards simultaneously. Some of these hazards are presented in the table on page 3.



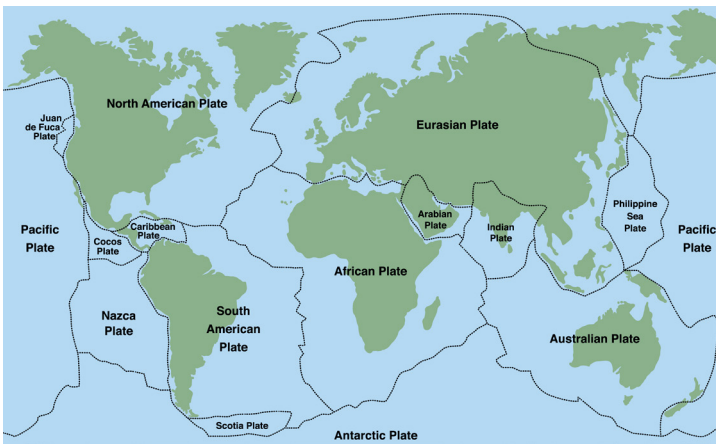
¹OCHA, UNDRR. 2023. Overview of Disasters and the Caribbean 2000 – 2022.

The natural, man-made and biological hazards that often affect Caribbean and Central American countries

Natural Hazards	Man-made Hazards	Biological Hazards
<p>Meteorological and Hydrological:</p> <ul style="list-style-type: none"> • Tropical cyclones (tropical storms and hurricanes) • Rainfall, including severe rainfall events • Lightning • Extreme heat and increasing temperatures • Floods • Drought • Sea-level rise 	<p>Chemical:</p> <ul style="list-style-type: none"> • Oil spills • Other chemical spills from industry that go on to contaminate rivers and sometimes cause fish kills • Transboundary movement of hazardous materials/wastes 	<p>Biological:</p> <ul style="list-style-type: none"> • Human disease outbreaks, epidemics, pandemics • Animal (livestock) and plant (agricultural) epidemics • Other biological/physical hazards such as poisoning, eutrophication, air pollution
<p>Geohazards:</p> <ul style="list-style-type: none"> • Earthquakes • Mud volcanoes • Tsunamis • Submarine volcanic eruptions 	<p>Technological:</p> <ul style="list-style-type: none"> • Road, aviation, marine and nautical accidents • Industrial accidents • Infrastructure failures • Aging infrastructure • Fires (bush and forest fires) 	
<p>Environmental:</p> <ul style="list-style-type: none"> • Land degradation • Coastal erosion/Coastal inundation • Soil erosion • Landslides • Sahara dust • Sargassum • Coral reef degradation • Alien invasive species 	<p>Societal:</p> <ul style="list-style-type: none"> • Fires • Terrorism • Cybercrimes/cyber security • Societal unrest 	

Earthquakes in the Caribbean and Latin America

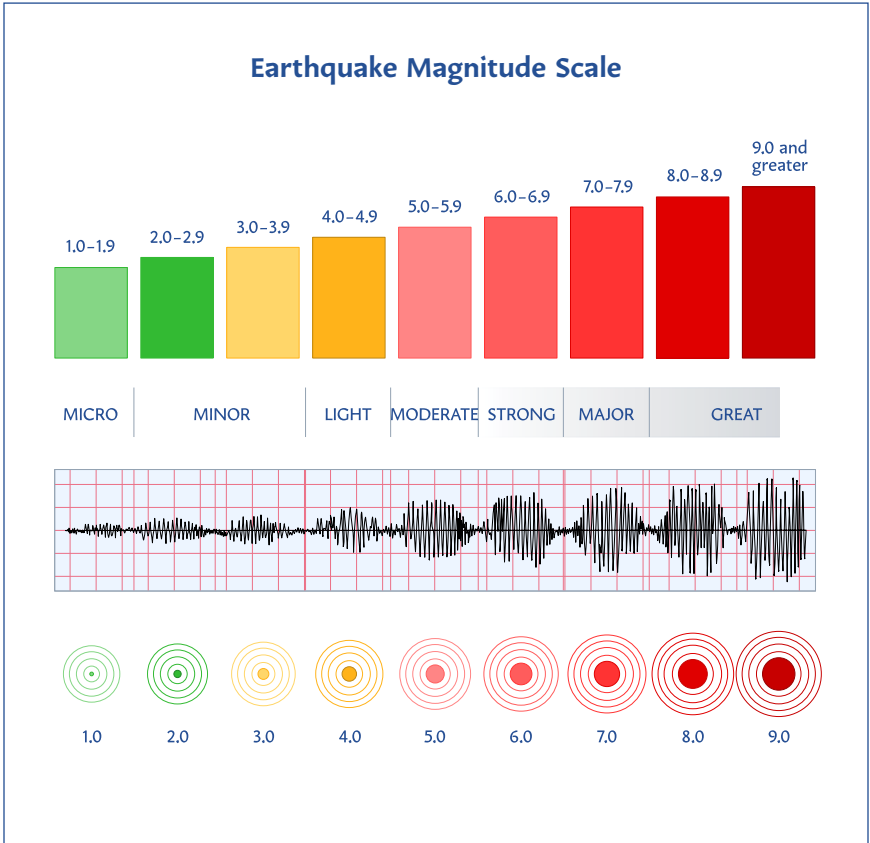
An earthquake is a sudden violent shaking or movement of part of the Earth's surface caused by abrupt displacement of rock masses, usually within the upper 10 – 20 miles of the Earth's surface. An earthquake can happen anytime of the day or night and there is usually no warning. Earthquakes are caused by the movement of plates (large slabs of rock) making up the surface of the Earth.



Global Tectonic Plates

To measure the magnitude of an earthquake, the Moment Magnitude Scale is used². This scale measures the size of the seismic waves, which is expressed in terms of a magnitude number. Earthquakes at 1 on the scale are very mild and often not even felt. Earthquakes between 3 and 4 on the scale are considered to be mild earthquakes while earthquakes beyond 7 on the scale are major and those beyond 8 are great.

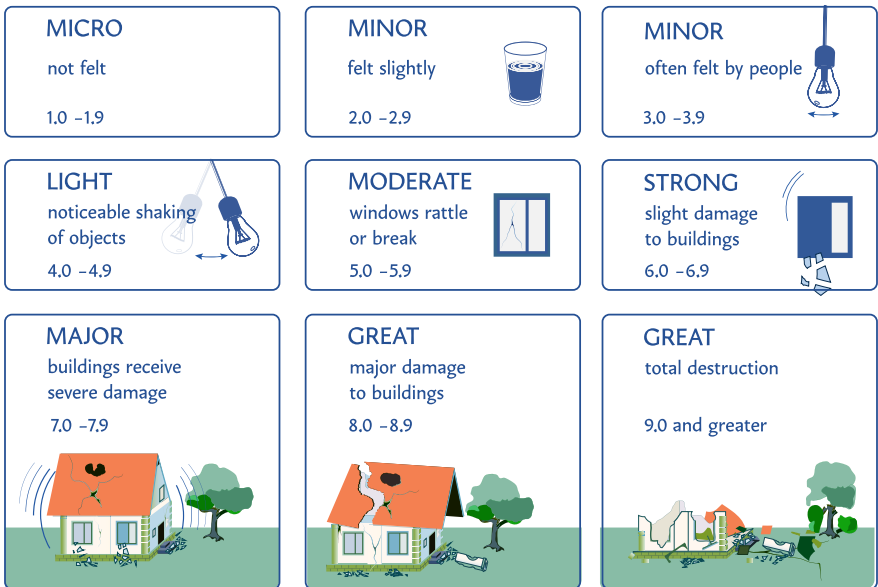
² This is an advancement on the Richter Scale, which was used up to 1970.



The Earthquake magnitude scale, which shows the strength of earthquakes and the size of the waves. The stronger the earthquake the bigger the seismic waves and the stronger the shaking.



Earthquake Magnitude Scale



This figure shows what can likely happen during an earthquake based on the intensity. Of course, the effects can be different depending on your location and vulnerability.

Some Key Facts about Earthquakes in the Caribbean and Latin America:



The areas of Central America and the western coast of South America are among the most seismic in the world because they are located in the “Ring of Fire”, a region characterized by the high presence of volcanoes and constant tectonic plate movements.



Central America also has the particularity that two tectonic plates converge within its area: the Caribbean and the North American Plates. That makes it a very seismically active area. Ecuador, Chile, Mexico, Peru, Guatemala, Costa Rica, Nicaragua, and El Salvador are some of the most vulnerable countries to earthquakes.



Since 2000, there have been 57 magnitude 7.0 or greater earthquakes in the region: 26 in Central America, 26 in South America and 5 in the Caribbean³.



The 2010 Haiti earthquake that measured 7.0 on the earthquake scale caused over 300,000 deaths, displaced over three million people, and made more than a million homeless. It ranks among the top 10 deadliest earthquakes in human history.



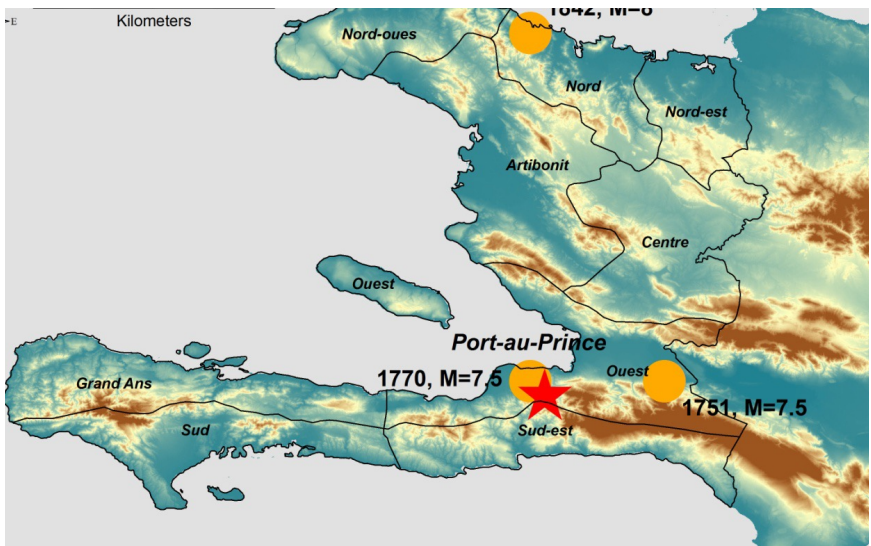
65 per cent of all earthquakes magnitude 8.0 or higher have occurred in South America.

³ Ibid



The Haiti Earthquakes of 2010 and 2021

A large earthquake struck close to the capital city of Port-au-Prince, Haiti late in the afternoon of January 12, 2010. The United States Geological Survey (USGS) estimated that the quake was a magnitude 7.0 event at a depth of 10 km just 15 km southwest of Port-au-Prince.



The red star shows the epicentre of the 2010 earthquake, which was 15 km southwest of Port-au-Prince. Note the two orange spots nearby that show the epicentres of two previous earthquakes in 1751 and 1770 with magnitudes close to 7.0.

The earthquake shaking was felt strongly in the Dominican Republic, Cuba, and Jamaica, although little to no damage happened outside of Haiti. The earthquake occurred along the Enriquillo Fault, which runs east-west along Haiti's southwest peninsula. Although smaller earthquakes are relatively common in Haiti, the last major earthquake to affect the country previously was in 1842 (devastating Cap Haïtien in the north).

Two large earthquakes in the middle of the 18th century also occurred close to Port-au-Prince, likely along the same fault line, and caused widespread devastation. These occurred in 1751 and 1770 and both had an estimated magnitude of 7.5.



An example of how previous events or the historical perspective can inform current preparedness strategies and disaster risk financing decisions.



Devastation caused by the 2010 Haiti Earthquake

On August 14th, 2021, another devastating earthquake of magnitude 7.2 struck Haiti, significantly impacting the city of Les Cayes. This earthquake was centred near Petit Troup de Nippes, approximately 78 miles to the west of Port-au-Prince and released approximately twice as much energy as the 7.0 earthquake that affected the country in 2010. Both quakes occurred on the same fault line, but the 2010 earthquake occurred nearer to the capital.



CCRIF Parametric Insurance Coverage for Earthquakes

Following both earthquakes, CCRIF made payouts to the Government of Haiti as follows:

- US\$40 million following the 2021 event.
- US\$7.8 million following the 2010 event.

Following the 2010 earthquake, the Government of Haiti began to increase its parametric insurance coverage for earthquakes, recognizing not only the country's vulnerability but also the need for quick liquidity following an earthquake. Haiti's cumulative increase in earthquake parametric insurance coverage has been about 400 per cent since 2010. This increased coverage has been made possible through premium support provided initially by the Government of Canada and subsequently by the Caribbean Development Bank, which pays Haiti's insurance premiums for earthquakes, tropical cyclones, and excess rainfall either fully or in part.

At the local level, CCRIF supports several civil society organizations (non-governmental organizations and community-based organizations) in Haiti as they work in their communities to build forward stronger – to reduce vulnerability and build resilience within local communities. CCRIF has provided more than 14 grants under its Small Grants Programme totalling over US\$400,000 to these organizations in Haiti to implement projects in disaster risk reduction, climate change adaptation and environmental sustainability.

Two earthquake-related projects implemented by Haiti under the CCRIF Small Grants Programme are highlighted on the following pages.

Identifying and Marking Landslide Sites to Reduce Community Members' Vulnerability to Landslides

In 2022, CCRIF awarded a grant of US\$24,050 to Urgence Pour la Réhabilitation et le Développement (URDev) to reduce the vulnerability of the commune of Camp Perrin to landslide risks. After the earthquake in August 2022, located in the Les Cayes Arrondissement in the Sud department of Haiti, the town of Camp Perrin experienced increased incidence of landslides. Camp Perrin was one of the towns most affected by the earthquake.

URDev and community members identified areas at risk of landslides in and around the community and created warning signs in these areas to mark the extent of the areas at risk. Many of these high-risk areas are along major roads that link Camp Perrin with other towns. A key follow-up activity was a series of sensitization sessions in the surrounding communities discussing the potential risks of landslides due to earthquakes and informing community members of the locations of the high-risk areas.



Training and Awareness Raising about Earthquake- and Tropical Cyclone-Resilient Construction

In 2019, CCRIF awarded a grant of US\$24,680 to Fondation Amour de Dieu en Action (FADA) to enhance construction of earthquake-resilient buildings in the communities of Port-de-paix and Saint Louis north (in northern Haiti) and Gros-Mornes (in the southeastern part of the country).

FADA conducted training for construction workers and students from vocational schools on earthquake- and hurricane-resilient construction techniques. Participants also included maintenance personnel from churches in three targeted communities. A total of 216 persons participated in the training. Some of these participants then conducted awareness raising activities with families on earthquake- and hurricane-resilient construction, reaching 986 families in the three communities.



Some Impacts of Earthquakes on the Natural Environment

Some of the impacts or changes that can happen to the natural environment following earthquakes are listed below.

Landslides – Unstable hillsides may slump or slide during or after the earthquake and rocks may break loose and slide downhill.

Soil Liquefaction – Soil liquefaction may happen where there is water in soils close to the surface. As vibrations and ground shaking pass through the water-saturated soil, it becomes like quicksand. Buildings and other infrastructure close to the liquefaction site can sink or tilt and hillsides can collapse.

Tsunamis – Tsunamis are caused by earthquakes that occur undersea or near the coastline and which are strong enough to rock the seafloor and disturb the mass of water over it. These movements then generate waves that travel at speeds up to 800 km per hour. Damage from tsunamis look similar to the damage caused by tropical cyclones (hurricanes and storms) and storm surges. The December 26, 2004 tsunami, also known as the Boxing Day Tsunami, occurred as a result of a magnitude 9.1 earthquake that had its epicenter under the Indian Ocean off the west coast of northern Sumatra, Indonesia. The resulting tsunami had waves of up to 30 m high. The tsunami devastated communities along the coasts of Indonesia and surrounding countries, killing an estimated 227,898 people in 14 countries in one of the deadliest natural disasters in recorded history⁴.

⁴ ITIC. 2024. Indian Ocean Tsunami.





Devastation caused by the 2004 Boxing Day Tsunami that occurred in Indonesia and surrounding coasts of the Indian Ocean.



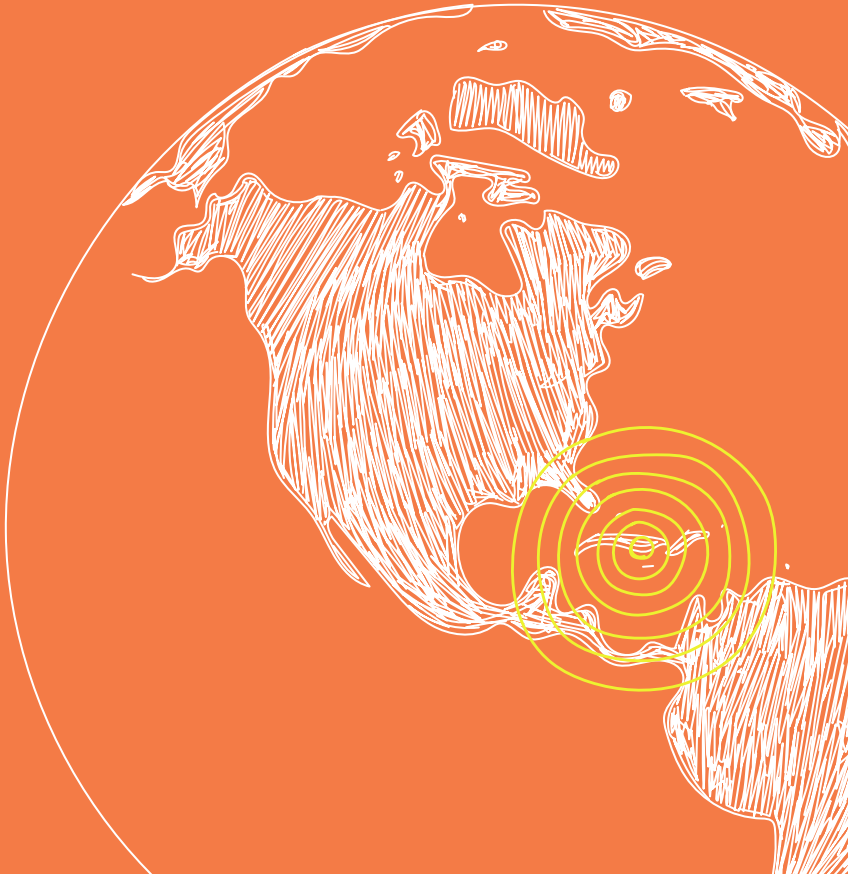
Before an Earthquake
PG. 17



During an Earthquake
PG. 22



After an Earthquake
PG. 26



An Earthquake Can Happen at Any Time!

BE PREPARED!

This booklet presents a list of tips that can help you prepare for earthquakes and has been compiled from several sources.

This is not an exhaustive list. Add to it and share with family, friends, and colleagues at work.

- Know your disaster management coordinator for your area and the phone numbers for your local authority or municipality.
- Have handy or know the phone numbers for emergency services, including the police, fire services and local ambulance services.
- Ensure insurance policies are up to date and have adequate coverage.



BE
Prepared! Earthquake Preparedness Tips and Checklists...

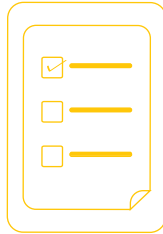


Before an Earthquake





Before an Earthquake



Whilst we never really know when an earthquake may happen, there are some habits and actions that we can take at home, school, our businesses, or in our communities to reduce potential negative impacts and damage.

- Stay informed about your community's risk and response plans and find out who the disaster management coordinator is for your area.
- In your home, classroom, or business ensure that top-heavy objects and furniture such as storage cabinets and bookcases are fastened to the wall and the largest or heaviest objects are placed on lower shelves.
- Never place paintings or wall objects over your bed.
- Ensure that mirrors are securely bolted to walls.
- Always have emergency equipment e.g., radios and medical supplies on hand.



- Ensure that there are adequate emergency supplies to last for 3 days.
- Know the basic positions (Drop, Cover and Hold On) and what to do in the event of an earthquake. Do some practices at your home, school or business.
- At your school, home, and/or business, know and agree on a designated open area for everyone to meet and make sure it is away from electrical lines and other hazards.
- Keep your important papers like passports in a plastic bag in a cabinet or another secure place such as a safe/vault if you have one so that it cannot be easily destroyed. You can also select a storage location outside of the earthquake zone.
- At your school, home, business or community, conduct regular earthquake drills.



A Tip for Supermarkets:

Supermarkets should consider bolting their shelves and using wires to prevent glass bottles etc., from falling off shelves.



On the shelves above, the bottles will move or shift but will not fall off shelves, thereby reducing risks to customers of falling glass and also reducing losses to supermarkets. This shelving is a better option in comparison to the photo below that shows bottles and other items that are likely to fall off of shelves during an earthquake and pose risks to nearby customers as well as incur losses to the supermarket as a result of broken stock.

10 Tips on Conducting an Earthquake Drill

You can do this exercise at home, at school, at your business, or in your community.

1. Use a whistle, PA system or alarm to signal the beginning of the shaking.
2. Announce that the earthquake drill has begun and instruct your fellow students, teachers, colleagues, or community members to “Drop, Cover, and Hold On”.
3. Count seconds out loud for the duration of the quake – 20 seconds. This will help keep everyone focused and calm and will allow persons to identify how long an earthquake can last.
4. With the whistle, PA system or other alarm, signal that the shaking has stopped.
5. Have everyone count to 60 and suggest that while still under the desk or table, persons should look around at what might fall on them in a real earthquake. These should be secured or moved after the drill.
6. After the 60 seconds are up, have everyone go to the designated area.
7. In a school setting, make sure the teacher has a list of students. At your business, ensure you have a list of all staff members. At home or in a community use the buddy system to account for everyone in the safe designated area.
8. Use suggested evacuation routes or an alternate route if yours is blocked or unsafe.
9. Use 4 evacuation rules – Don’t Talk! Don’t Push! Don’t Run! Don’t Turn Back!
10. Check that all exit routes are clear. Move directly away from the building when exiting. Cover your head with a bag or book if available. Do NOT use any elevators.



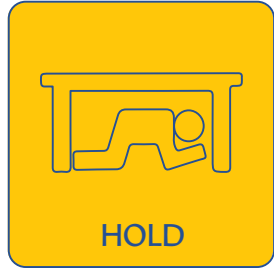


During an Earthquake





During an Earthquake



Staying Safe Indoors and Outdoors

- Drop, Cover, and Hold On. Drop means that you need to get under a sturdy desk or table. Make sure to protect your head. Make yourself as small as you can. Cover means that you must keep your head and eyes protected from falling or flying objects. Cover your head with one hand. Hold the object that you are under with your other hand. If it moves, move with it. Stay under shelter until you are sure the shaking has stopped.

- If you are inside stay there. Stand in a doorway or crouch under a desk. If you are near a doorway stay there as the extra construction around a doorframe makes it one of the strongest parts of a building. And of course, there is rarely anything over a doorway to fall on you. However, avoid doorways that have air conditioners above them as these can fall and injure you.



- If you cannot shelter under furniture or a doorway, move against an interior wall if you are indoors, drop, put your arms over your head and across the back of your neck for protection. If there is a book, pillow, tray, or other protection at hand, hold it over your head and neck. It is better to break your arms than to have something fall on your head or neck, which will probably result in unconsciousness, paralysis, brain damage or death.
- If you use a cane, drop, cover, and hold on or sit on a chair, bed, etc. and cover your head and neck with both hands. Keep your cane near you so it can be used when the shaking stops.
- If you are in a wheelchair or use a walker, lock your wheels, and remain seated until the shaking stops. If you are unable to drop, brace yourself and protect your head and neck. Protect your head and neck with your arms, a pillow, a book, or whatever is available.
- Move as little as possible – most injuries during earthquakes occur because of people moving around, falling, and suffering sprains, fractures, and head injuries. Try to protect your head and torso.
- Only when the shaking has stopped, should you go out, but stay far from any buildings or trees, as the danger may not be over yet.

- Stay away from windows and glass dividers.
- Watch for heavy furniture that may topple over.
- If you are in a high-rise building do not crowd exits since stairways may be jammed with people.
- If you are in a building do not use the elevator.
- If you smell gas, get out of the building, and move as far away as possible.
- If you are outside, stay there, but stay away from buildings, trees, and telephone and electricity lines.
- If driving, stop in the safest place possible. Avoid overpasses and underpasses.
- If a power line falls on your vehicle, do not get out. Wait for assistance.
- If you are in a mountainous area or near unstable slopes or cliffs, be alert for falling rocks or debris and landslides.
- If you are near the ocean, consider the potential risk for a tsunami and walk or drive inland.





After an Earthquake





After an Earthquake

- If you are inside, immediately evacuate and go to an open area, away from buildings and trees.
- If you are at school or at work go to the designated open area.
- Check for injuries and provide first aid or seek medical attention for more serious injuries.
- Check for safety hazards such as gas, water, or sewage leaks, as well as broken, dangling, or damaged electricity lines.
- Check for fires. Do not use matches, lighters, appliances, or electrical switches until you are certain there are no electrical shorts or gas leaks.
- If the power is out, unplug major appliances to prevent possible damage when the power is turned back on. If you see sparks, frayed wires, or smell hot insulation, turn off electricity at the main fuse box or breaker. If you will have to step in water to turn off the electricity you should call a professional to turn it off for you.
- Do not use the telephone except in the case of an emergency. Remember that rescue workers will need all available lines.
- Wear shoes to prevent injuries from stepping on materials that may have fallen.



- Check stairs before using them as stairs can weaken after an earthquake; when evacuating check steps carefully before placing your full weight on them.
- Listen for emergency bulletins or public announcements from the national disaster agency or the government.
- Follow the instructions of public safety personnel and relief organizations.
- Do not go into damaged areas unless you are told it is safe to do so by the authorities.
- Be prepared for the “aftershocks” or those smaller earthquakes that follow the major earthquake.
- Report any damage to the relevant authorities.
- Check your homes, schools, and office buildings etc. Inspect both the the interior and exterior of the building. Look for cracks in the walls, shifted posts or pillars, and cracks in decks/verandahs and sidewalks. If you see anything other than minor cracks, evacuate the building immediately and do not re-enter the building until a professional has checked it for safety.
- If you are trapped, protect your mouth, nose, and eyes from airborne debris by placing a cloth or clothing over your mouth and nose and signal for help by using a whistle or knocking loudly on a solid piece of the building three times every few minutes.

- If you feel an aftershock, **DROP, COVER, and HOLD ON.** Aftershocks frequently occur minutes, days, weeks, and even months following an earthquake. Remember that aftershocks, particularly those following a big earthquake, can cause a lot of damage. Overpasses, bridges, and some buildings might survive the main shock, but fall during an aftershock. If you are not at home, stay where you are for a while and wait for any aftershocks and information from the radio.

- Do not drive unless you are away from tall buildings and bridges.

- Use a trusted media source for updates on disaster response and seismic information. This could be a trusted local media source or a trusted organization that focuses on the hazard, such as The UWI Seismic Research Centre or The UWI Earthquake Unit.

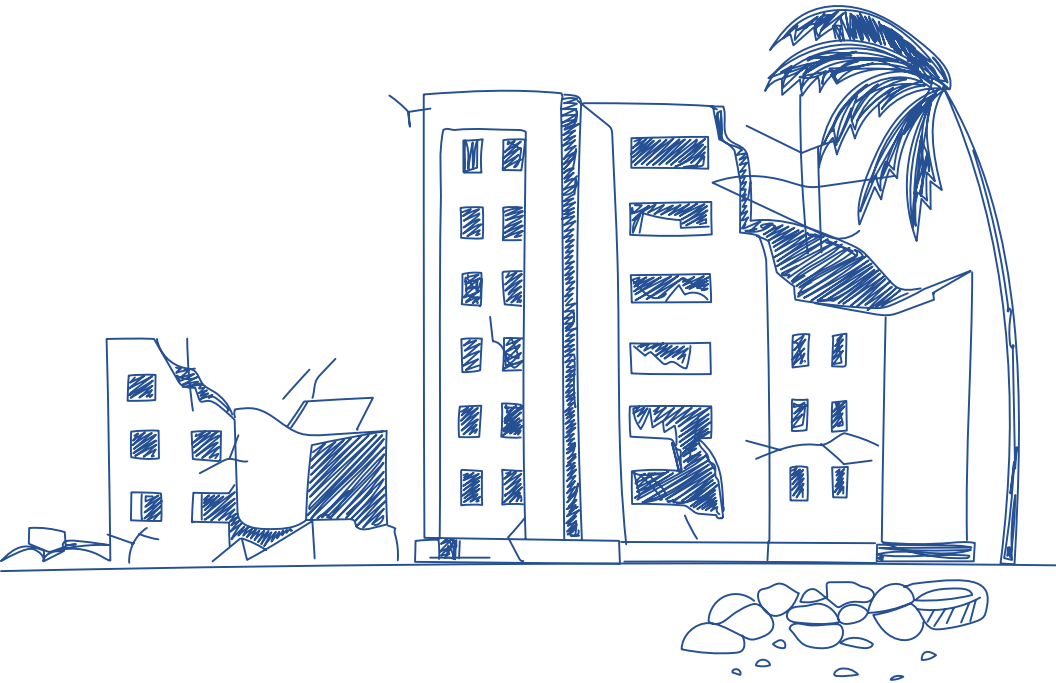
- Pay attention to how you and your loved ones are experiencing and handling stress.

- Help people who require additional assistance – infants, elderly people, persons without transportation, large families who may need extra help in an emergency, people with disabilities, and those who care for them.

- Take pictures of home/school/office damage for insurance purposes.



- Be cautious and wear protective clothing and sturdy shoes when cleaning and repairing your home.
- Clean up spilled chemicals, medications, bleach, gasoline, or other flammable liquids immediately.



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