

What-to-do manual: Volcanic Eruption

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In an eruption, what kills is almost never the lava. It's lahars — rivers of mud and rock that race down valleys tens of kilometers from the crater — and pyroclastic flows, which cannot be outrun. And what wrecks daily life for weeks afterward is the ash. This guide covers all three, and why the only real defense against the first two is knowing in advance whether you live in their path.

Before the crisis

Distance from the crater is deceiving

Lahars are, in the USGS's own words, "**fast-moving mixtures of mud, rock, and water that surge down river valleys like wet concrete,**" and **can travel tens of kilometers down-valley** — the USGS cites a case that reached **80 km**. So the right question isn't "how many kilometers away is the volcano?" but "**am I in a valley that drains the volcano?**" A town 50 km downstream can be in more danger than one 15 km away on a ridge.

1. Find the hazard map for your volcano

The USGS lists this as step one: "review hazard maps to understand your exposure, plan evacuation routes, and prepare your home or business in advance." Those maps are published by your country's volcano observatory. Look at it once, calmly, and locate your house, your school, and your workplace on it. That's half an hour you won't have on eruption day.

2. Learn where your high ground is, in meters of elevation

Against a lahar you don't run forward, you climb. The USGS gives the figure: know the quickest route to high ground, **at least 30 meters (100 ft) above the valley floor**. That's not 30 meters of distance — it's 30 meters of elevation above the channel. Walk it once so you know how long it takes.

3. Prepare your home for ash — the one thing that's certain

Ash travels much farther and much more often than any other hazard. IVHHN recommends keeping on hand **masks and eye protection**, a battery radio, flashlights, medication, and cleaning supplies, plus **water for at least 72 hours: one gallon (3-4 liters) per person per day**, along with non-perishable food for the same period, pets included.

4. Disconnect your gutters before it falls

This is the most specific piece of advice, and the one almost nobody knows: IVHHN recommends **disconnecting gutter downspouts** and disconnecting rainwater collection systems **before** ashfall begins. Otherwise the ash clogs them and contaminates your tank.

5. Agree on a meeting point outside the valley

If the family is scattered between home, school, and work, the meeting point needs to be **outside the channel** and up high. And an out-of-town contact everyone calls: when the local network gets overloaded, a long-distance call sometimes still gets through.

Your observatory sets the alert level

Every country has its own volcano observatory and its own alert scale, with its own names and colors. **This guide cannot tell you what level your volcano is at today:** look it up at your country's observatory and follow its advisories over any general guidance.

Source: U.S. Geological Survey · Cascades Volcano Observatory — Prepare for the Next Volcanic Eruption: lahars, pyroclastic flows, and hazard zones. <https://www.usgs.gov/observatories/cvo/prepare-next-volcanic-eruption-pacific-northwest>

Source: IVHHN — International Volcanic Health Hazard Network — Preparedness for ashfall: what to stock, roofs, vehicles, and water.
<https://www.ivhnn.org/information/preparedness-ashfall>

During the crisis

You cannot outrun a pyroclastic flow

The USGS describes them as **"extremely fast-moving currents of hot gas, ash, and rock that can reach speeds of hundreds of miles per hour,"** and adds the phrase that defines the whole strategy: they are **"among the most dangerous volcanic hazards and are almost always deadly."** There is no survival technique within their reach. The only defense is **not being in the zone**, which is why evacuations are ordered early and with a wide margin.

1. **If evacuation is ordered, leave now.** With volcanoes, the gap between the order and the event can be minutes.
2. **Stay away from river channels.** The USGS: "avoid river channels during heavy rain or volcanic activity." A lahar can arrive without any explosion you've heard.
3. **If ash is falling, get indoors.** Close doors and windows, put damp towels along door gaps, and tape drafty windows (IVHHN).
4. **Don't drive if you can avoid it.** Ash cuts visibility to almost nothing and damages engines. If you must, go slowly with your lights on.
5. **Protect your eyes.** Volcanic ash is ground glass and rock: it scratches the cornea. Wear closed goggles, and skip contact lenses.
6. **Keep pets indoors.** If pets go out, brush them before letting them indoors (IVHHN).

Children — this one matters

IVHHN is explicit about something few people know: **"Unfortunately respirators are not made to fit children's faces. For this reason, children must be kept indoors and stopped from playing in dusty environments whilst ash is present."** There is no children's mask that truly protects: a child's protection is the inside of the house.

If you have a beard

Another IVHHN fact that changes what you should do: a respirator's fit depends on contact with smooth skin, so **"a good fit relies on close contact between the respirator and smooth skin without hair in the region of the seal. Consequently a beard or beard stubble can affect the fit and reduce protection."** If you'll be working in an ashy environment, shave the seal area.

People with asthma, COPD, or heart disease

Fine ash is the main respiratory hazard. Stay inside, with the house sealed, and keep rescue medication within reach and in view, not in a drawer. If shortness of breath doesn't ease with your usual medication, seek medical care.

Which mask actually works

IVHHN recommends **certified high-efficiency disposable masks** under recognized standards — **N95** in the United States or **EN 149 (FFP2/FFP3)** in Europe — and warns that if a mask doesn't carry that certification mark, **"do not use these masks for protection from volcanic ash."** A wet cloth helps you stop coughing, but it doesn't filter the fine fraction, which is the part that reaches the lungs.

Source: U.S. Geological Survey · Cascades Volcano Observatory — Prepare for the Next Volcanic Eruption: lahars, pyroclastic flows, and hazard zones.
<https://www.usgs.gov/observatories/cvo/prepare-next-volcanic-eruption-pacific-northwest>

Source: IVHHN — International Volcanic Health Hazard Network — IVHHN Recommended Dust Masks for Protection from Volcanic Ash.
https://ivhnn.org/uploads/es/IVHHN_Recommended_Dust_Masks.pdf

Source: IVHHN — International Volcanic Health Hazard Network — Preparedness for ashfall: what to stock, roofs, vehicles, and water.
<https://www.ivhnn.org/information/preparedness-ashfall>

After the crisis

The roof is what kills after the eruption

IVHHN gives the number worth memorizing: "**most roofs cannot support more than four inches (10 cm) of wet ash.**" Dry ash already weighs a lot; soaked by rain, it weighs far more. Clear it **before** it builds up excessively, and don't wait for rain to start before deciding to act.

- **Wear a harness when clearing the roof.** This is IVHHN's explicit recommendation: ash makes the surface slippery and hides the edge.
- **Don't soak the ash to remove it.** IVHHN warns that over-wetting it **increases the weight and the risk of collapse.** A little water so it doesn't fly around, not an open hose.
- **If water became contaminated with ash,** IVHHN says to let it settle and then use the clear water on top. Avoid dishwashers and washing machines while contamination is heavy: ash is abrasive and destroys pumps.
- **Change your vehicle's oil and filters much more often** — IVHHN mentions every 50 to 100 miles (80-160 km) in very dusty conditions — and clean brakes and the alternator with compressed air.
- **Secure clean food and water for livestock,** which is usually where the economic loss begins in rural areas.
- **Don't dry-sweep indoors.** It just kicks the fine dust you removed back into the air; dampen lightly and collect it instead.

And the warning that still holds once it all seems over: as long as loose material remains on the slopes, **every heavy rain can generate a new lahar.** The USGS says it plainly — avoid river channels during heavy rain or volcanic activity — and that rule holds for months after the eruption, not days.

Source: IVHHN — International Volcanic Health Hazard Network — Preparedness for ashfall: what to stock, roofs, vehicles, and water.

<https://www.ivhnn.org/information/preparedness-ashfall>

Source: U.S. Geological Survey · Cascades Volcano Observatory — Prepare for the Next Volcanic Eruption: lahars, pyroclastic flows, and hazard zones.

<https://www.usgs.gov/observatories/cvo/prepare-next-volcanic-eruption-pacific-northwest>

Family plan

A family plan is not a pretty document: it is a handful of agreements made **today**, while everyone is calm, so you do not have to decide with your heart racing and no signal on your phone. It takes one conversation over the table and fits on a sheet of paper stuck to the refrigerator.

1. Decide where to meet, in two different places

One near home, for getting out quickly, and another outside the neighborhood, in case you cannot get back to the area. Everyone should know both by heart, children included, and it should not depend on anyone having a phone handy.

2. Name an out-of-area contact

One person in another city that everyone texts when they can. That person gathers information and passes it along, so no one has to go out looking for anyone else. It works because local lines get overloaded first, and because a text gets through where a call does not.

3. Assign responsibilities to specific people

Who grabs the emergency bag, who shuts off the gas and power, who helps the older person or someone with reduced mobility, who gets the pets out. A task with no owner is a task no one does.

4. Keep the list on paper

Phone numbers for family, the out-of-area contact, the doctor, the school, insurance, and emergency services. On paper, in the emergency bag, and in your wallet. A phone with a dead battery has no address book.

5. Practice it once

A fifteen-minute drill reveals what the conversation does not: that the emergency bag was buried in the closet, that no one knows where the gas shutoff is, that the child does not remember the meeting point. Repeat it at least once a year and whenever something important at home changes.

Talk to children without scaring them

Explaining what might happen and what you will do reduces fear instead of adding to it: panic comes from not knowing, not from knowing. Tell them the plan like a routine —"if this happens, we go there and meet mom"—, let them help pack the emergency bag, and tell them clearly that **if they are at school, the school takes care of them and no one comes running to get them**. And do not forget the pets: they are part of the plan too, with their food, water, and carrier.

Source: FCC and FEMA (U.S.) — Tips for Communicating During an Emergency.

https://www.fcc.gov/sites/default/files/fcc-fema_tips_for_communicating_during_an_emergency.pdf

Source: Ready.gov · FEMA (U.S.) — People with Disabilities. <https://www.ready.gov/es/discapacidad>

Source: Ready.gov · FEMA (U.S.) — Financial Preparedness. <https://www.ready.gov/financial-preparedness>

Food and water

The water number you need to memorize

The CDC sets it without ambiguity: **at least 1 gallon (3.8 liters) per person per day, for 3 days**. Ready.gov adds the nuances that save whoever heeds them: **"children, nursing mothers, and sick people may need more"**, and **"with very high temperatures, water needs can double"**. If someone in your home is pregnant, sick, or you live in a hot climate, that number is a floor, not a target.

How to store it so it works when you need it

The CDC calls for **approved food-grade containers** with a tight-fitting lid, made of a sturdy, unbreakable material —**never glass**— and with a narrow mouth for pouring. An explicit warning: **never use a container that has held toxic chemicals** such as bleach or pesticides. And what almost everyone forgets: **stored water should be replaced every 6 months**. To disinfect the container before filling it, use a teaspoon of unscented household bleach per liter of water, wait 30 seconds, and pour it out.

What food to keep on hand

Ready.gov recommends **several days of non-perishable food** and gives a concrete list: ready-to-eat canned meats, fruits, and vegetables —**and a can opener**—, protein or fruit bars, dry cereal or granola, peanut butter, dried fruit, canned juices, and pasteurized long-life milk. The rule when putting it together is simple: food your family will actually eat, that needs no cooking, and that you can rotate before it expires.

No power, the food clock is running: 4 hours and 48 hours

The official figures come from FoodSafety.gov, part of the USDA: **a refrigerator keeps food safe for up to 4 hours** if you do not open it, and **a full freezer holds for about 48 hours (24 if half full)**. The discard threshold: any perishable food —meat, poultry, fish, eggs, leftovers— that has been **at 4 °C (40 °F) or above for 2 hours or more must be thrown out**. A full freezer holds twice as long as a half-full one, so filling the empty space with bottles of water before a forecast storm is money saved. And the line every agency closes with: **"when in doubt, throw it out"**. Do not taste it to find out.

- Keep the refrigerator and freezer **closed**: every time you open one, you waste hours of stored cold.
- **Throw out any food that has touched floodwater**, even if the container looks intact. This is an explicit Ready.gov instruction.
- Keep a manual can opener. It is the item people forget most, and without it your pantry is useless.

- If you buy bottled water, keep it **sealed in its original container**, in a cool, dark place.

Source: CDC — Centers for Disease Control and Prevention (U.S.) — How to Create and Store an Emergency Water Supply.

<https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html>

Source: Ready.gov · FEMA (U.S.) — Water. <https://www.ready.gov/water>

Source: FoodSafety.gov · USDA and HHS (U.S.) — Food Safety During a Power Outage.

<https://www.foodsafety.gov/food-safety-charts/food-safety-during-power-outage>

Source: Ready.gov · FEMA (U.S.) — Food. <https://www.ready.gov/food>

Power and communications

The generator rule: 6 meters, no negotiating

The CPSC does not soften it: **"using a generator indoors CAN KILL YOU IN MINUTES"**, because **"generator exhaust contains carbon monoxide, a poison you cannot see or smell"**. The official distance, repeated by the CDC and CPSC: **only outdoors, more than 20 feet (6.1 meters) from any window, door, or vent**. The same goes for pressure washers, charcoal grills, and camp stoves. A battery-powered carbon monoxide detector is cheap and the only thing that warns you in time.

When the cell network is overloaded: text, do not call

The joint FCC and FEMA guide explains why: **"text messages may get through when your call does not"**, even if delivery is delayed when the network is congested. And it asks for something almost no one does: **"limit non-emergency calls"**, because every call takes up space that emergency communications need. Also save a contact under the name **"ICE"** (In Case of Emergency), the convention rescue personnel look for on someone else's phone.

How to stretch your battery

The same guide recommends **lowering screen brightness and turning off apps** to conserve charge. In an emergency your phone stops being entertainment and becomes your only line to the outside world: treat it like your water supply.

The battery-powered radio is still irreplaceable

The FCC and FEMA recommend **a battery-powered radio or a portable television** to follow emergency bulletins during power outages. It is the only channel that depends on neither your electricity nor the cell network.

The alerts you already have and did not know about

In the United States, **Wireless Emergency Alerts** are free messages that go straight to your phone for severe weather, AMBER alerts, and threats to safety in your area. Two things worth knowing: **you do not need to sign up —phones have supported them since 2012— and they are not affected by network congestion**, so they get through when calls no longer do. Find out what the equivalent system is in your country, and do not mute it.

- Have at least one light source that does not depend on the grid: a battery-powered or hand-crank flashlight, or a rechargeable lamp.
- Charge phones and backup batteries **before** the forecast event arrives, not after the power is already out.
- Keep a list of important phone numbers **on paper**: if your phone dies, your contacts die with it.
- Agree with your family that after an emergency **everyone texts the same contact** instead of calling each other.

Source: CPSC — Consumer Product Safety Commission (U.S.) — What to Know About Portable Generators and Carbon Monoxide.

https://www.cpsc.gov/s3fs-public/468-WhattoKnowGenerators_2022.pdf

Source: FCC and FEMA (U.S.) — Tips for Communicating During an Emergency.

https://www.fcc.gov/sites/default/files/fcc-fema_tips_for_communicating_during_an_emergency.pdf

Source: FEMA (U.S.) — Wireless Emergency Alerts (fact sheet). <https://www.ready.gov/sites/default/files/2020-08/wea-fact-sheet.pdf>

Health and special needs

This is the section that decides who has a hard time and who has a dangerously hard time. An emergency does not suspend diabetes, high blood pressure, pregnancy, or dependence on an oxygen concentrator: **what gets cut off is access to the pharmacy, the clinic, and electricity**. Everything that follows needs to be prepared beforehand, because once the emergency hits, there is no more room.

1. Keep a reserve of your medications, and know which ones hold up

Ready.gov calls for **a several-day supply of prescription medications**. For those that need refrigeration, the CDC is blunt: **once the power has been out for a day or more, discard any medication that requires refrigeration**, unless its label says otherwise.

2. The insulin exception, worth knowing word for word

The FDA documents that insulin in the manufacturer's original vials or cartridges —opened or unopened— **can stay unrefrigerated between 15 and 30 °C (59 and 86 °F) for up to 28 days and still work**. It loses effectiveness at extreme temperatures, and the longer the exposure, the less effective it becomes. In an emergency **"you may still need to use insulin that was stored above 30 °C"** —that is better than not using it at all— but as soon as proper storage is available again, those vials **should be discarded and replaced**.

3. If someone depends on electric medical equipment, there is one step almost no one takes

Ready.gov says it explicitly: you can **ask your power company to put you on a priority list for service restoration**. That step is free, can be done on any ordinary day, and changes the order in which you get reconnected. Add a backup battery for an electric wheelchair and for any assistive device, and talk with your doctor about how to keep the equipment running during a power outage.

4. Keep a copy of medical information, not just the pills

A list of medications with dosages, allergies, diagnoses, doctors' contact information, and —for infants— the vaccination record. A prescription bottle cannot always be refilled at a pharmacy in another city; a written list can solve that.

Pregnancy and newborns

The CDC calls for **prenatal vitamins and other medications** in the kit, plus supplies in case delivery happens without being able to reach a hospital: clean towels, clean sharp scissors, a bulb syringe, gloves, two clean white shoelaces to tie the cord, clean sheets, sanitary pads, soap or alcohol, and garbage bags. For infants: diapers, wipes, ointment, bottles, and formula. One detail that matters: **ready-to-feed formula is the safest option in an emergency**, because it does not need to be mixed with water and comes in sterile, single-use containers.

Disability, reduced mobility, and older adults

Ready.gov stresses **planning accessible transportation in advance** for evacuating or getting around, and including a service or support animal with its food, water, and supplies. That plan should be worked out with specific, named neighbors, not left vague.

The blow that comes later: mental health

The CDC names the normal reactions after a disaster —**fear, anger, sadness, worry, numbness, frustration, trouble sleeping, or nightmares**— and recommends taking care of your body, staying in touch with other people, and taking breaks from the news. In the United States and its territories, the **Disaster Distress Helpline is available 24 hours a day: 1-800-985-5990**, with service in Spanish. Asking for help here is not weakness: it is part of recovery, just like repairing the roof.

Source: Ready.gov · FEMA (U.S.) — People with Disabilities. <https://www.ready.gov/es/discapacidad>

Source: CDC — Centers for Disease Control and Prevention (U.S.) — What to Do to Protect Yourself During a Power Outage. <https://www.cdc.gov/natural-disasters/response/what-to-do-protect-yourself-during-a-power-outage.html>

Source: FDA — U.S. Food and Drug Administration — Information Regarding Insulin Storage and Switching Between Products in an Emergency.
<https://www.fda.gov/drugs/emergency-preparedness-drugs/information-regarding-insulin-storage-and-switching-between-products-emergency>
Source: CDC — Centers for Disease Control and Prevention (U.S.) — Emergency Kit Checklist: Pregnant Women, Infants, and Children.
<https://www.cdc.gov/children-and-school-preparedness/resources/emergency-kit-checklist-pregnant-women-infants-and-children.html>
Source: CDC — Centers for Disease Control and Prevention (U.S.) — Coping With Disaster or Traumatic Event.
https://www.cdc.gov/natural-disasters/media/pdfs/2024/08/coping_with_disaster_2_english.pdf

Home and belongings

Photograph before you throw anything away. It is the rule that recovers the most money

The official insurance instruction is literal: **"photograph and video the interior and exterior of your property, taken before you throw anything away"**. After that, you need to **report the loss to your insurer right away**, and **keep receipts, statements, and contractor invoices**, which is what ensures your claim payment arrives on time. Cleaning up before documenting is, in practice, giving up your claim.

1. Before you go back in: look, smell, and listen from outside

The CDC lays it out this way: **if you smell gas or suspect a leak, shut off the main valve, open all the windows, and get out immediately**. If there is standing water inside and you can cut the power from a dry spot, do it. And one simple warning that prevents explosions and fires: **use battery-powered flashlights, not candles, gas lanterns, or torches**.

2. Ventilate before you settle in

The CDC recommends going in briefly to open doors and windows, and **letting the house air out for at least 30 minutes** before staying inside.

3. Shutting off utilities: when to do it, and the mistake you cannot make

Gas has a rule with no exceptions: if you shut it off for any reason, **only a qualified professional can turn it back on. Never turn it back on yourself**. **Electricity** is shut off by switching off the individual circuits first and the main breaker last—the order matters, because an electrical spark can ignite gas if there is a leak—. **Water** should be shut off if pipes may have cracked, because that contaminates the house supply, and should not be turned back on until authorities confirm it is safe to drink.

4. Go back only when authorities say it is safe

It sounds obvious, and it is the instruction people break most often: **go back home only when authorities say it is safe**. Structural damage is not always visible from the street.

- Make a photo inventory of what is in each room today: it takes twenty minutes and is worth its weight in gold for a claim.
- Keep that inventory and your policies **outside the house**—in the cloud or with a family member— because a file that gets soaked along with the house is useless.
- If you have to leave, take your documents with you, not your furniture.
- Do not sign anything with a contractor while you are in shock: check the money section for the warning signs of fraud.

Source: FEMA · NFIP (U.S.) — Starting Your Recovery (National Flood Insurance Program fact sheet).
https://agents.floodsmart.gov/sites/default/files/media/document/2025-07/fema-nfip-starting-your-recovery_fact-sheet-10-2021.pdf
Source: CDC — Centers for Disease Control and Prevention (U.S.) — Safety Guide for Reentering a Flooded Home.
<https://cdc.gov/floods/safety/reentering-your-flooded-home-safety.html>
Source: Hawaii Department of Human Services (U.S.) — Utility Shutoff and Safety (official emergency preparedness guide).
<https://humanservices.hawaii.gov/communications/are-you-ready/utility/>

Money and income

Cash in small bills: the detail people discover too late

Ready.gov recommends it for a concrete reason: **"it is important to keep small bills on hand because ATMs and credit cards may not work during a disaster"**, right when you need to buy supplies, fuel, or food. No power means no card reader, and without a card reader a large bill is useless if no one has change.

The documents you need to protect today

The official recommendation is to keep insurance policies, deeds, property records, and other important papers **in a safe place outside the house**. FEMA publishes the **Emergency Financial First Aid Kit** for this, organized into four sections: household identification, financial and legal documentation, medical information, and contacts. Its rule for paper: **a fireproof and waterproof box or safe**, a bank safe-deposit box, or in the hands of someone you trust. For digital files: **password-protected files** on an external drive or in secure storage outside the home. And if you pay everything online, print your account records periodically.

An emergency fund, even a small one

The CFPB avoids magic formulas: **"the amount you need depends on your situation"**, but **"even a small amount can provide some financial security"**. Its underlying argument is the one that matters: without that cushion, a single unexpected expense **can grow far larger than the original bill through interest and fees**, because it forces you to rely on credit.

After the disaster come the people who rob you with paperwork

The CFPB describes the exact pattern: **"be wary of contractors who go door to door and of people who offer unsolicited 'opportunities' or use high-pressure tactics to force you to decide on the spot"**. Its concrete rules: **never pay by wire transfer, gift card, cryptocurrency, or cash**, because that makes it harder to get your money back; **do not make the final payment until the work is finished to your satisfaction**; and always ask **"can you show me your ID and your contractor's license?"** and **"can you give me three recent references from this area?"**. One fact that cuts off many scams at the root: **no FEMA worker or federal or state official ever asks for or accepts money**. Scammers pose as government employees, insurance adjusters, police officers, or bank employees.

Source: Ready.gov · FEMA (U.S.) — Financial Preparedness. <https://www.ready.gov/financial-preparedness>

Source: FEMA · Operation Hope (U.S.) — Emergency Financial First Aid Kit (EFFAK).

https://www.fema.gov/sites/default/files/documents/fema_effak-toolkit.pdf

Source: CFPB — Consumer Financial Protection Bureau (U.S.) — How to Avoid Scams and Fraud After a Disaster.

<https://www.consumerfinance.gov/ask-cfpb/how-do-i-avoid-scams-and-fraud-after-a-disaster-en-1529/>

What you can sell

Volcanic ash creates a very particular kind of demand: it doesn't destroy all at once like an earthquake, it **accumulates**. And as long as it keeps falling, the same work has to be repeated, which turns several of these services into recurring income rather than a one-time job.

- **Ash removal from roofs**, which is the urgent one: wet ash weighs far more and can collapse a light roof.
- **Cleaning of gutters, rooftop tanks, and cisterns**, because ash contaminates stored water and clogs drains.
- **Car washing and air-filter changes**: ash is abrasive and ruins engines and paint.
- **N-95 masks, goggles, and plastic covers** to protect electronics and furniture.
- **Temporary sealing of windows and gaps** with tape and plastic, house by house.
- **Cleaning of solar panels and air-conditioning units**, which lose efficiency when coated in ash.

Raising prices because people are desperate can be illegal

When a state of emergency is declared, many countries limit by law how much the price of basic goods can rise. In **California**, the limit is **10% above the pre-emergency price** for 30 days —and **180 days for repair and cleanup services**—, with penalties of up to one year in jail and a \$10,000 fine. **Texas** does not set a fixed percentage but penalizes "exorbitant" pricing with fines of up to \$20,000 per violation. In **Mexico**, the Ley Federal de Protección al Consumidor (Federal Consumer Protection Law) requires sellers to honor the price offered and any maximum prices set by authorities, and PROFECO can impose fines. In **Brazil**, the Código de Defesa do Consumidor (Consumer Defense Code) prohibits "raising a price without just cause." Charging a fair price for hard work is legitimate; taking advantage of desperation is not.

Source: ILO — International Labour Organization — Labour Overview of Latin America and the Caribbean 2025 (executive summary).

https://www.ilo.org/sites/default/files/2025-12/Executive%20Summary_Labour%20Overview%202025_LAC_ILO.pdf

Source: PROFECO — Federal Consumer Protection Agency (Mexico) — Ley Federal de Protección al Consumidor (Federal Consumer Protection Law), articles 7, 8, and 128. https://www.profeco.gob.mx/juridico/pdf/Ley_fed_protec_consum.pdf

Source: California Attorney General (USA) — Price gouging during declared emergencies. <https://oag.ca.gov/consumers/pricegougingduringdisasters>

Source: Presidency of the Republic (Brazil) — Código de Defesa do Consumidor (Consumer Defense Code), art. 39, X (raising prices without just cause). https://www.planalto.gov.br/ccivil_03/leis/l8078compilado.htm

Businesses and self-employment

It helps to start with one figure to size up what we're talking about: according to the ILO, informality **affects nearly half of the employed population of Latin America and the Caribbean, around 47%**, with huge differences between countries — under 30% in Uruguay and Chile, over 70% in Bolivia and Peru. For millions of families in the region, "looking for a job" and "starting something on your own" are the same sentence. What follows is not a promise of income: it is a map of what people actually do when a crisis hits, with the requirements and the risks laid out plainly.

Roof ash removal — the most requested service, and the most delicate

You need a stable ladder, plastic or wooden shovels (metal ones damage roofing), sacks, N-95 respiratory protection, and a harness if the roof has a pitch. Two warnings you need to tell the client and follow yourself: **never clear a wet roof** or one with ash still actively falling, and falls from height are among the risks OSHA most often documents in recovery work. Charge by square footage and by thickness, not by "the whole roof."

Vehicle filters and car washing

With a pressure washer, air filters for the area's most common models, and a space with drainage, you can meet demand that repeats with every ash fall. The key to the business is inventory: having the filter the customer needs today is worth more than doing a spotless wash next week.

Respiratory-protection supply

Selling legitimate N-95 masks — not cloth face coverings, which don't filter fine particles — is a public-health service as much as a business. Buy from an identifiable distributor, keep the invoice, and don't promise protection the product doesn't give. Reputation is the asset here: whoever sold fake masks during the emergency doesn't sell anything else in their neighborhood again.

Three jobs you should NOT improvise

Mold: the EPA sets the threshold at **10 square feet (about 3 ft × 3 ft)**; above that, or if the water came from sewage, it recommends hiring an experienced professional. Even below that threshold, you need an **N-95** respirator, long gloves, and non-vented goggles. **Chainsaw:** NIOSH is unequivocal that only a trained person should use one, and OSHA warns about kickback from the tip. **Electrical and gas lines:** OSHA instructs you to assume every downed line is energized, and NIOSH advises staying **10 feet (3 meters)** away from them. That work belongs to certified personnel, not on-the-job learning.

United States — SBA disaster loans

For areas with a declared disaster. The **Economic Injury Disaster Loan (EIDL)** provides working capital for affected small businesses and nonprofit organizations; the **physical damage loan** covers losses not covered by insurance. Combined cap of **\$2 million**, interest **not exceeding 4%** if you cannot obtain credit elsewhere, terms of up to 30 years, and the first payment deferred 12 months. There is also a line for homeowners (up to \$500,000) and for renters for personal property (up to \$100,000).

Mexico — what actually exists today

FONDEN stopped taking on new commitments on January 1, 2021. What operates today in emergencies is **PAEAN**, run by Civil Protection, and it is worth knowing exactly what it is and is not: it delivers **relief supplies** — food kits, water, blankets, roofing sheets, cleaning materials — when a state's own capacity is overwhelmed. **It is not a reconstruction fund or a loan for your business.** For capital, look at state, municipal, or development-bank programs, always verifying on the official website: fraud schemes that use its name circulate around these programs.

Brazil — Pronampe for micro and small businesses

A credit line for **microenterprises** (annual revenue up to 360,000 reais) and **small businesses** (from 360,000 to 4.8 million). The amount can reach up to **60% of the previous year's gross revenue** for businesses with more than one year in operation, and up to 50% for new ones. The maximum rate is the SELIC rate plus up to 6% per year.

Source: EPA — Environmental Protection Agency (USA) — Mold Cleanup in Your Home (10-square-foot threshold).

<https://www.epa.gov/mold/mold-cleanup-your-home>

Source: OSHA — Occupational Safety and Health Administration (USA) — Keeping Workers Safe during Disaster Cleanup and Recovery (FS-3698).

https://www.osha.gov/sites/default/files/publications/OSHA_FS-3698.pdf

Source: NIOSH — National Institute for Occupational Safety and Health (USA) — Hurricane and Flood Key Messages (Publication 2025-106).

<https://www.cdc.gov/niosh/docs/2025-106/pdfs/2025-106.pdf>

Source: SBA — Small Business Administration (USA) — Economic Injury Disaster Loans.

<https://www.sba.gov/funding-programs/disaster-assistance/economic-injury-disaster-loans>

Source: SSPC — National Civil Protection Coordination (Mexico) — Guidelines for the Program for Emergency Response to Natural Hazards (PAEAN).

<https://sidof.segob.gob.mx/notas/docFuente/5626632>

Source: Federal Government (Brazil) — Novo Pronampe — credit for micro and small businesses.

<https://www.gov.br/memp/pt-br/programa-acredita/novo-desenrola-brasil/novo-pronampe>

Related articles

Related guides on this site:

- Earthquake — seismic activity often accompanies volcanic activity.
- Flood — lahars behave like a surge, and rain sets them off.
- Health crisis — prolonged respiratory effects of ash.
- Supply crisis — roads and airports closed by ash.
- All crises in your country.

Frequently asked questions**I live far from the volcano. Does it still affect me?**

It depends on whether you're in a valley that drains it. The USGS documents lahars that traveled tens of kilometers — up to 80 km in one case — along river channels. Ash, meanwhile, travels even farther, and depends on the day's wind.

How long does a volcanic crisis last?

Much longer than the eruption itself. Ash keeps moving with wind and rain for weeks, and lahars can reactivate with every storm as long as loose material remains on the slopes. Prepare for weeks, not days.

Does a surgical mask work against ash?

Not as real protection. IVHHN recommends certified N95 or EN 149 (FFP2/FFP3) masks and warns against using uncertified masks for volcanic ash.

My young child has to go outside. What do I put on them?

IVHHN's honest answer is that no respirator fits a child's face, which is why the recommendation is to keep children indoors while ash is in the air. If going out is unavoidable, keep it as brief as possible with the face covered, knowing that isn't equivalent to real protection.

How much ash can my roof hold?

IVHHN puts the general limit at four inches (10 cm) of wet ash for most roofs. That's why ash should be cleared early and without soaking it: wetting it increases the weight and the risk of collapse.

The eruption is over. Can I cross the river again?

With caution and attention to the forecast. As long as loose material remains on the slopes, heavy rain can form a new lahar; the USGS recommends avoiding river channels during heavy rain or volcanic activity, and that applies for months.

What should a family emergency plan include?

Two meeting points—one near home and one outside the neighborhood—, an out-of-area contact everyone texts to gather information, assigned tasks with names attached (who grabs the emergency bag, who shuts off gas and power, who helps people who need support, who gets the pets out), and a list of important phone numbers on paper. It is worth practicing at least once a year.

How much water should you store per person for an emergency?

The CDC recommends at least 1 gallon (3.8 liters) per person per day for 3 days. Ready.gov warns that children, nursing mothers, and sick people may need more, and that with very high temperatures water needs can double. Stored water should be replaced every 6 months.

How long does food last in the refrigerator during a power outage?

According to FoodSafety.gov, part of the USDA, a refrigerator keeps food safe for up to 4 hours if it stays closed, and a full freezer for about 48 hours (24 hours if half full). Any perishable food that has been at 4 °C or above for 2 hours or more should be discarded. The official rule is: when in doubt, throw it out.

How far from the house should a portable generator be placed?

Only outdoors, more than 20 feet (6.1 meters) from any window, door, or vent, according to the CDC and CPSC. The CPSC warns that using a generator indoors can kill in minutes, because its exhaust contains carbon monoxide, a poison you cannot see or smell. The same rule applies to pressure washers, charcoal grills, and camp stoves.

Is it better to call or text during an emergency?

Text. The joint FCC and FEMA guide explains that text messages may get through when a call does not, even if there is a delay when the network is congested, and it asks people to limit non-emergency calls so they do not tie up the network that emergency services need.

Does insulin go bad if the power goes out?

Not right away. The FDA documents that insulin in the manufacturer's original vials or cartridges, opened or unopened, can stay unrefrigerated between 15 and 30 °C for up to 28 days and still work, though it loses effectiveness at extreme temperatures. In an emergency it is better to use it than to go without, but as soon as proper storage is available again, those vials should be discarded and replaced.

What should you do if someone at home depends on medical equipment that needs electricity?

Ready.gov recommends asking the power company to put your address on a priority list for service restoration, keeping a backup battery for electric wheelchairs and assistive devices, and talking with your doctor about how to keep the equipment running during a power outage. This is something to arrange beforehand, not during the emergency.

Can you start cleaning your house after a disaster?

Before you throw anything away or clean anything, you need to photograph and video the interior and exterior of the property and report the loss to your insurer right away, according to the official guide from FEMA's National Flood Insurance Program. You should also keep receipts, statements, and contractor invoices. Cleaning before documenting usually means losing the claim.

Can you turn the gas back on yourself?

No. The official emergency preparedness guide is explicit: if you shut off the gas for any reason, only a qualified professional can turn it back on. Also, when shutting off electricity, switch off the individual circuits first and the main breaker last, because an electrical spark can ignite gas if there is a leak.

Why should you keep cash on hand for an emergency?

Because ATMs and card readers depend on electricity and network access, and they tend to stop working right when you need to buy water, fuel, or food. Ready.gov recommends keeping a small amount of cash at home, in a safe place and in small bills, since change may not be available during an emergency.

How can you tell if a contractor offering to repair your house is a scam?

The CFPB flags as red flags going door to door, offering unsolicited opportunities, or pressuring you to decide on the spot. It recommends never paying by wire transfer, gift card, cryptocurrency, or cash, not making the final payment until the work is finished to your satisfaction, and asking for ID, a contractor's license, and three recent references from the area. Also, no FEMA worker or federal or state official ever asks for or accepts money.