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High Reliability Organization Council
(Ukraine office)

Changing the way people think®

10-POINT
CHECKLIST & PROCEDURE for
SURVIVAL ESSENTIALS (CPSE)

*FORTIFYING CIVIL DEFENSE FOR BOMB SHELTERS AND
"IN-HOUSE SAFETY AREAS"*

REVISED DRAFT (11/7/22 v7)



"The will to win is not nearly as important as the will to PREPARE to win."

- Bobby Knight

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Main Checklist and Procedures for HROC's "EvacPac"

(i.e., Evacuation Packs)

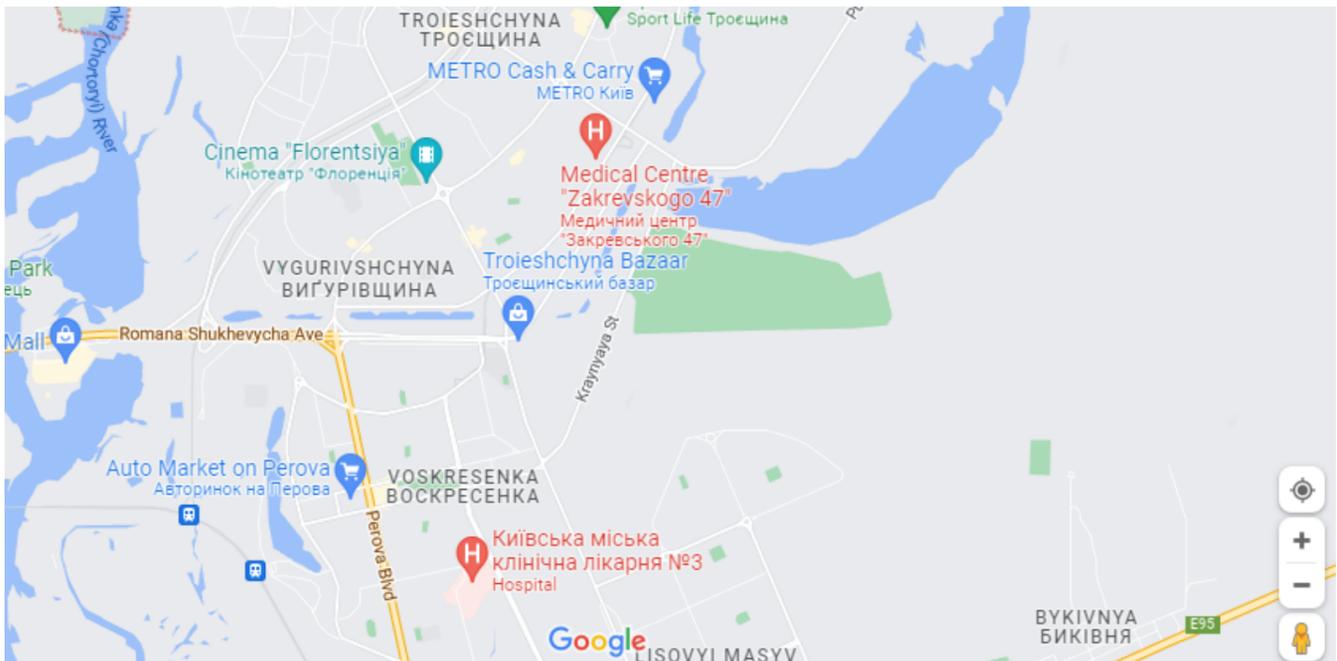
(with relevant figures and sketches where possible)

Purpose: Inform the public on how to survive better inside shelters, survive via "in-house safety areas" when unable to get into a bomb shelter safely, and address the current ([Kherson](#)) and potential ([Kyiv](#)) evacuation preparation needs, given the destruction of critical infrastructure and the onset of winter. The Ukrainian Government has [warned](#) it may not be able to recover infrastructure in time before crisis hits. As many as [3 million Ukrainians](#) are expected to leave their homes this winter, the World Health Organization said, as Ukraine's government said it can't guarantee basic services like heat, power, and water. The need extends beyond Ukraine, as the war also risks spillover to [Poland](#), Russian media is calling for [direct attacks](#) on the U.S./U.K., and risks of nuclear fallout spread from [missiles](#), [reactors](#), or [dirty bombs](#).

Notes:

- In this main checklist, each checklist item's title has hyperlink to more explanation in the Details section.
- Be sure to prepare all of this before crisis hits, having the components and process ready and all tested.

1. [Blast Shockwave](#) (for nuclear attack but also any explosions that create blast force wind)

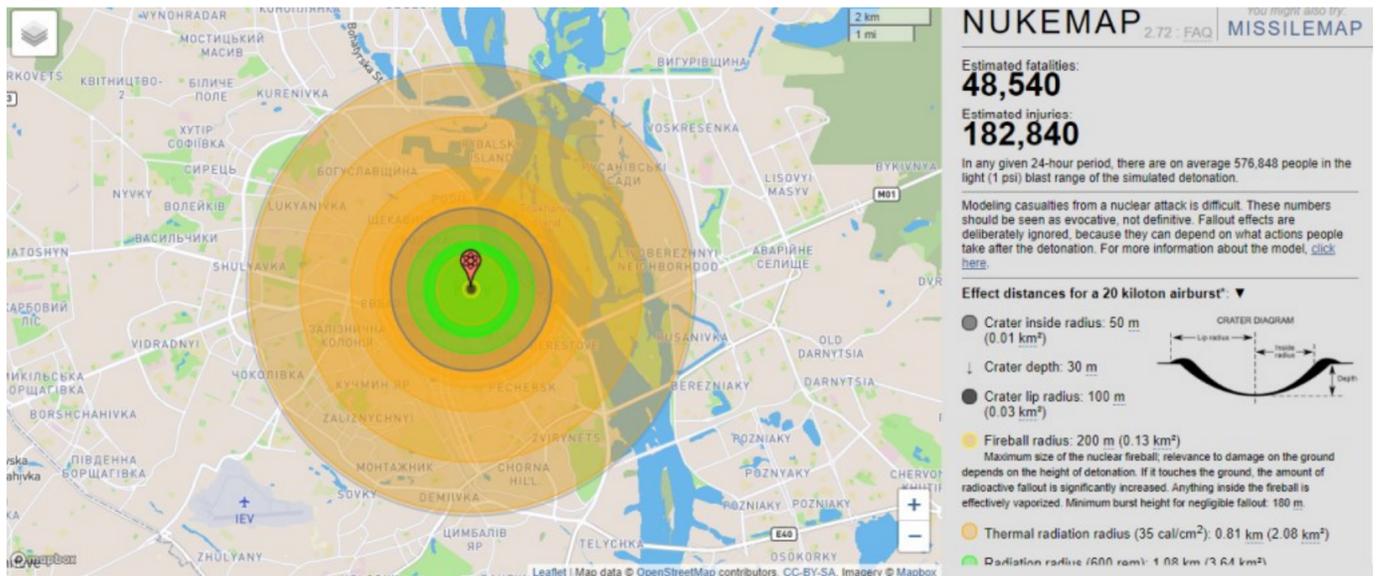


1. Currently, Russian missiles and killer drones are mostly **targeting critical infrastructure** of Ukraine (initially hospitals, now power and water – and also any clusters of people). You can determine likely infrastructure targets (that match the past targets) for yourself using [Google maps](#). Then listen for air raid siren or for people verbally (or social media) sightings in the sky.

2. **Learn the likely targets – and where you are relative to them – to know your risk. Run away from them**, toward basements, underpasses, subways, etc. if available. If not available, see #3.

3. If you are in an **open space** and see a drone, quickly **move perpendicularly** (i.e., right or left) from its trajectory, then lie on the ground, cover your head with your hands, and open your mouth to reduce blast effects. Or, more likely, you are at a **home or building**, so it's crucial to have ready of **blast shielding** from stacks of paper and any PCB plastic you can find (since it is stronger and lighter than even steel) to create "in-house safety area" (see Details section [point #1](#) for more on how to create blast shielding from projectiles hurled after an explosion)

2. **Blast Heat** (for nuclear attack but also any explosions that create heat)

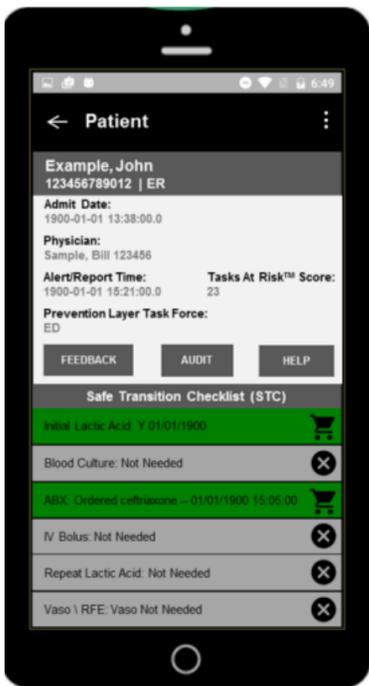


1. If you are near a target, a [website](#) can help **estimate the fireball** (as well as shockwave, and if nuclear, the radiation expected), if given location and key variables of an explosion, like the amount of payload, which we have estimated for killer drones to be about 0.2 KT, and typical Russian missiles are often 2 to 3 times that payload. Just 30 meters matters for life vs. death.

2. If you are likely in radius, use **heat shielding** of drywall / gypsum board, or flame resistant cloth or clothing like polyester found in flame-resistant pajamas or even nylon pantyhose.

3. Soak in water **wet blankets or cloth** put in front of/top of the plastic ice coolers filled with water (or other water-holding tanks), to wet **blast shielding** paper against heat, lest it catch fire – then use wet blankets **even for yourself** if you see yourself within the blast heat radius. (See [Details](#) section for more.)

3. Smartphone Operation (when facing nuclear threat or prolonged loss of electricity)



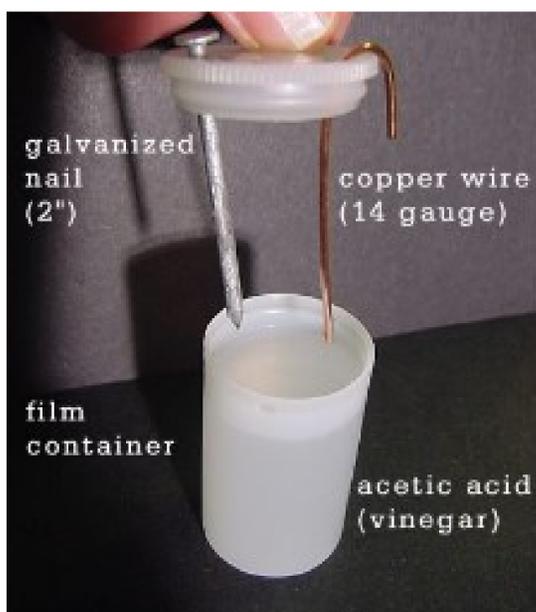
1. Smartphones are used to **store checklists**, to guide you (via help from others) when there is a crisis, and to **communicate** with family and the world. Therefore, keep it **protected** from physical and electronic threats, and have on standby alternate ways to **charge** it.



2. Do not keep your phone plugged into a charger beyond 100% charge if there's a risk of nuclear detonation (and the electromagnetic pulse, or EMP, damage that comes with it). Protect the phone's electronics inside any box that has **5 layers of heavy-duty aluminum foil** wrapped around it as shielding -- basically the key step in fully creating a [Faraday Cage](#).



3. For power, ideally use a **crank generator** ([like HROC has sent to Ukraine to test](#)) but you can also build **make your own battery** and store the power created by it (in any lead-acid battery you can find). For example, make a [vinegar battery](#) from metals you can find around a house (e.g., a copper pipe or a mesh of copper wire, and zinc plated items like galvanized nails, buckets, or a 5 hryvnia Ukrainian [coin](#)), or for more charge, a [bleach battery](#) and aluminum cans or foil.



4. Uneven power is not too big a problem when charging a lead acid battery meant to power a smartphone. But **to fully charge** a phone it will **need at least 2 amperes** (or amps) over some period of time. Most phones require at least **4.8 volts** to charge (some can do 4.4V) from a battery. Anything above 2.15 volts per cell should **trickle charge** a lead acid battery and keep your smartphone charged for use during a crisis when power is inconsistent or unavailable.

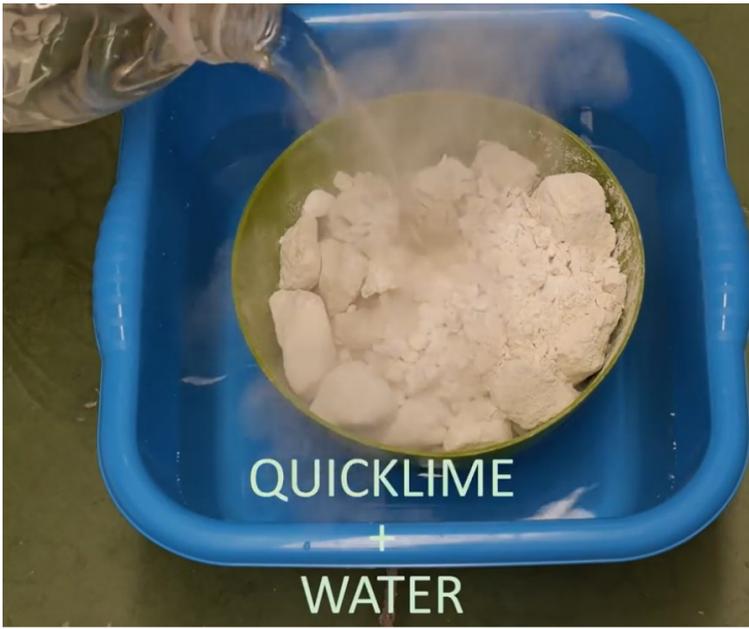
4. [Hypothermia](#) (when temperatures are below 10 degrees Celsius, or 50 degrees Fahrenheit)



1. Heat generation and / or conservation is the only way to avoid hypothermia, which – though people know they’re cold – is actually a **silent killer in your sleep**. To avoid this, the first step is always conserve heat, not only dressing in layers for warmth and sitting close together to share warmth, but also **insulating** areas where you are against heat loss. For example, use **garbage bags of shredded paper** for corners and even walls, and window covers made of **double-paned plastic wrap** with a 3.5 inch air pocket (see [Details](#)) to serve as a more transparent insulator.



2. For a **primary heat source** that can generate enough heat quickly with virtually any material that will burn, and with less carbon monoxide emissions as it has an air intake under the fuel (so the fuel can get more oxygen to burn more completely / cleanly), there is the do-it-yourself (DIY) “**rocket stove**” – please see the Details section for more information. We have shown it can heat with most [anything](#) that burns, and allows charcoal to [burn](#) for at least an [hour](#) (maybe >4 hrs.).



3. As a secondary heat source, or for one that reduces emissions and cleans air, use **quicklime**. It generates only 10% the heat of firewood, but can still boil water. More importantly, once water is added, it turns into “slaked lime,” which can capture carbon dioxide in air bubbling through it.



4. Note that if you have access to concrete you can pour (or someone who can help you do so), then you can create a **concrete rocket stove** that is more durable than the paint can version, but also heavier, so not ideal for evacuation. But it is good if to make (see Details section) if you are at home <***NOTE: We will add a link for the pic of the cardboard mold needed for this stove>.

5. **Breathable Air** (when conserving heat or protecting from nuclear fallout, chemical/biological agents)

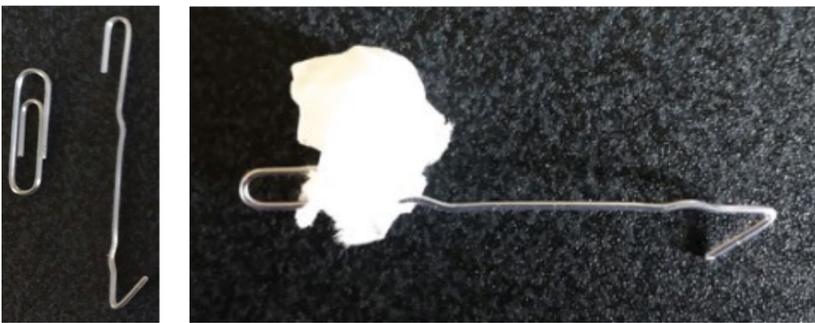


1. Just being in a **sealed environment** without burning anything gradually depletes oxygen and raises CO₂ levels due to human metabolism (thus, talk less, breathe calmly, etc.). But if you are burning most fuels, it produces lots of carbon dioxide (roughly 3 kg CO₂ for every 1 kg of fuel). Worst of all: Burning fuel in air depleting of oxygen increases risk of carbon monoxide – which is **a hidden, silent killer in your sleep**. **THEREFORE, IT IS CRITICAL TO PREPARE FOR THIS PROBLEM.** You must know how much **breathable air** you have, and need, when conserving or making heat. Of course, if it is not too cold outside and you have enough fuel to last, as well as there are no nuclear or other threats outside, you can ventilate with outside air for 5 minutes or more every hour. A big problem will be the burning of wet wood in fireplaces/stoves everywhere, which not only gives less heat but also **leaves residue** in the exhaust, leading to blockages that will back up exhaust into the living area. Thus, exhausts can't be assumed to rid you of toxic air in a room.

2. **Detection** of problems is first concern. For this, we have focused on **symptoms** that indicate significant, if not extreme, risks to the onset of toxic air (i.e., lack of breathable air) or of radiation or hypothermia risk, since they do not require buying, nor charging, of devices. These are in our **checklists** for **sealed** and also **ventilated** environments, and what to do if there are signs of trouble. (NOTE: There are other DIY tests we are developing that would not require devices or power that may not be available, coming in future updates.) Clearly, having a **battery-operated carbon monoxide detector** with you at all times is preferable, but may simply not be practical.



3. Then **solutions** are critical – whether **corrective** once detection occurs, or **preventive** to reduce the risk of detecting (especially when detection capability is poor). Although ideally indoor air composition should be changed to reduce toxicity, that may not be practical, so outdoor air may be only good option. But allowing that air in will rob you of heat in the winter, and inject you with radioactive dust if there's nuclear fallout. Therefore, we have invented DIY “hyper-localized ventilation system”, which is basically a “**toxic air snorkeling**” method (with [explanation](#) found in the Details section) made of a 2-liter bottle, tape, balloons, [garden hose](#), a belt or string to hold the hose in place. The key are intake and exhaust valves that must be made, or else the hose must be short and person right next to the window where the hose connects. In the Details section, we explain the **buddy system sleep shifts** (watching for not only symptoms, but also snorkels becoming loose or falling off), **checklist monitoring** (for all relevant checklists), **daytime sleeping** (to reduce risk of hypothermia), and **wake-up alarms for self-checks** (on the checklists).



4. For nuclear fallout, we have also invented a way to reduce the radioactive dust breathed into a person's lungs using a DIY filter approach – a **cotton ball set** (from 2 balls down to as little as $\frac{1}{2}$ a ball, depending on ability to breathe sufficiently, especially when asleep) placed on an **extractor** (made of a bent paper clip that provide hooks for both the cotton and the hose) inserted at the end of the hose connected to the outside through a window to be able to remove (and discard outdoors) periodically as dust builds on the end facing the outdoors air.

5. **Transforming** toxic air is actually possible **through** a combination of raw materials like **quicklime** (to capture CO₂), then food-grade **hydrogen peroxide and bleach or catalyst** metals (to replenish oxygen). In addition, basic chemistry, physics, and math is needed – but all of which can be done on your smartphone. See Detail section for how, but it is of lower priority for an EvacPac since they are likely too heavy to carry and must be obtained where you stay the night.

6. **Radiation** (when there is nuclear fallout from tactical nuke, “dirty bomb”, or reactor accident/attack)



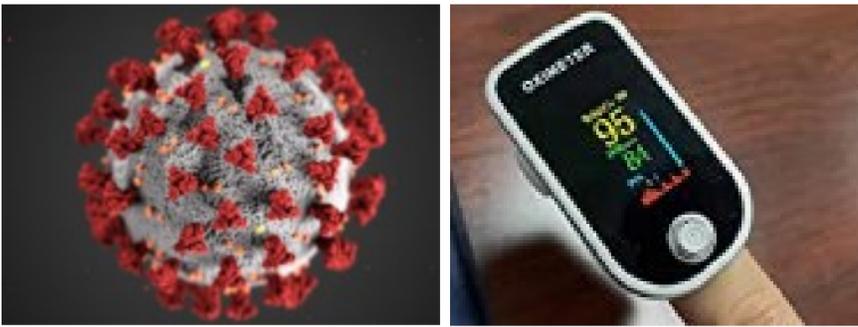
1. Radiation poisoning results from radiation destroying the blood cell manufacturing of the body found in the **bone marrow**, and about half that capacity is in hip and femur bones. So that area especially must be **protected from** two key sources of radiation, which is: A. **Radioactive dust** (radioactive isotopes that attach to dust in the air) noted in item #5 above that is breathed in, and then B. **Gamma rays** and neutrons that settled onto everything outside.

2. Radiation has a well-known [symbol](#), but not a well-known test at home when you have no power (or a Geiger Counter), so we have a [procedure](#) that can help identify radiation in the air, to then **know when to start sealing** the shelter or In-House Safety Area (IHSA). Below, you will also see a well-known shield that offers an 80% solution – ice coolers filled with water.



3. For the **shielding** from the outside radiation, especially gamma rays, we can't block all of it, but we can **reduce risk** of radiation poisoning by **blocking 80%** or more of it. Just **7 inches of water** can accomplish this, or **3.5 inches of concrete** (1 hollow concrete block has about 2 inches). So an **ice cooler** ([around \\$20 or less](#)) of about 10 to 12 inches width, **filled with water** should be able to hold enough to block this 80% if you make a wall of them around your bedding area of your IHSA on the floor on the ground floor (for how many you may need, and what the weight considerations will be, see the Details section). **Above you**, you will also need a layer of **water in either** an old waterbed mattress or a frame of wood around a very large rubber mat that has garbage bags filled with at least 4 inches of water, though the cost-benefit of more water may be low (since it is assumed less radiation should stay on the roof as it will blow off).

7. Respiratory Infection



1. The most deadly infectious disease the past few years has been Covid, leading to diagnostic efforts like [AI for Covid detection](#) via x-ray. Or there is the best test when you don't have a Covid test is a CT scan. But what happens when you don't have these machines, which will cost at least thousands of dollars (and even if you did, they will break during war conditions)? A decent stand-in is a **pulse oximeter** device (typically [costing less](#) than \$25, but can be made [DIY to an extent](#) as well). It is to enable a mobile, improvised clinic, and should be part of any IHSA. It detects blood oxygen levels from your fingertip, with **any level below 92%** being cause for concern that Covid / pneumonia is developing and **should be treated as soon as possible** to prevent deadly infection.



2. The best **treatment for pneumonias** that may result from not only Covid, but also simply the effects of war, such as toxic dust, choking from rushed food and drink, mild traumatic brain injury, or even just smoke, cold, or dry air and crowds of people is to use preventive or mitigating **antibiotics** like Ampicillin, by mouth if early enough, else crushed and given as an IV. More info can be found [at our link](#) of progress updates where we discuss pulse oximeters and antibiotics.



3. The best **prevention for Covid and most respiratory infections** we believe is HROC's **Invisible Mask Initiative (IMI)**, a combination of preserving your immune system's first line of defense -- your mucous membranes -- by using an **humidifier made of a pot of water** (boiling, or even just evaporating), and then also ensuring you are not weakening your immune system by **improving toxic air** (to understand why, think of this analogy: CO₂ is like "sand" in the gears of the body and its immune system, while CO is the "wrench" that can stop it dead; then humidity in the air is like "oil" for the immunity gears to help it run better – and then there's O₂, without which the gears don't have power to turn at all) – so hence, **breathable air** discussed in item #5 is critical.

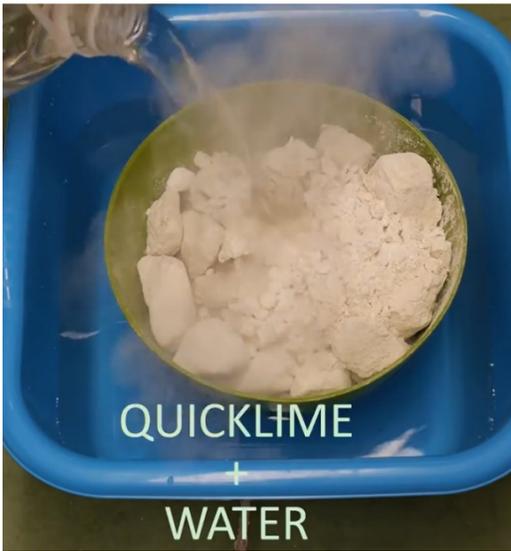
8. Contaminated Water



1. *Cholera was reported in Mariupol, and other waterborne diseases are possible when there is damaged or destroyed water and sewage treatment plants. The fastest way to rid water of disease pathogens is to first **boil it** with at least 1 minute of rolling bubbles.*



2. *The way to boil water is to put a **grill attachment over the rocket stove**, which you could buy, but it is also possible to put a set of metal strips or rods above the flame to make your own grill, to then set pots of water on them to boil. **Or you can [create](#) our poured concrete version** of a rocket stove (cardboard mold shown in point #4) since you can simply set pot above the concrete as long as you put some **masonry nails on the 4 corners at about an inch above** the top so that the exhaust can exit, else it will back up and the CO2 will put out the flame.*



3. **If you do not have:** A. Rocket stove, B. Material to burn in it, or C. Ventilation ability and thus have risk of toxic air buildup, then **use quicklime** to heat water that you want to drink or use using our concept of a “**quicklime boiler.**” Place water in a smaller can, cover it, and put in the center of a paint can (**like a rocket stove** in paint can shown above, **except no intake can** needed on the side, there should be a **cover for both small and large cans**, and there should be **insulation like wool all around paint can** to retain heat). Outside and all around the smaller can, inside the paint can, use weigh scale (or find objects that weigh this much to compare) to place .65 kgs quicklime, and then slowly add .18 kgs water (splatters so wear eye / face protection!), cover it, and repeat till enough heat (use thermometer to see if hits >71 degrees Celsius). Water added to the quicklime should be allowed to reach at room temperature before adding to quicklime, else a lot of energy will be used to just warm cold water. If paint can insulated well, then temperature of quicklime can reach up to 260 degrees Celsius, more than enough for what’s in the smaller can to reach at least **160 degrees F**, and if it stays at that temperature **for 5 minutes**, that should **kill 95% of microbes** in the water (or food) you place in the smaller center can.



4. Then **filter the water from the smaller can** using crushed charcoal in a clean cloth, or simply a layer of cotton balls placed on a wire mesh over a pot you would pour into. This can remove particulates, and what’s left can be reasonably safe, drinkable water, if it looks and smells okay.

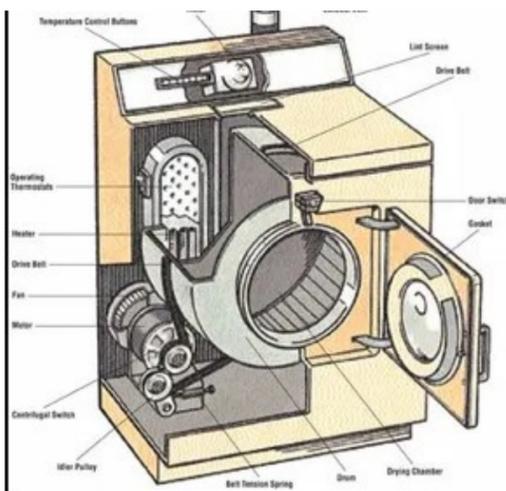


5. **Save the (slaked lime solution) water** in the paint can for use **to capture CO2** later using new techniques we are currently developing to be part of the EvacPac.

9. More Electricity – Faster



1. HROC has delivered to Ukraine already various electric generators, from [solar](#) generators used out in the field, as well as a [hand-crank](#) generator like the one above to people sheltering. The challenge we discovered is both the cost (\$100 or more) and also shipping delays (1 to 2 months we found, due to the difficulty sending anything with lithium batteries, as they are a fire hazard). Even crucial [protective wear](#) we sent took 3 months to deliver due to various delays. Therefore, we believe the best approach to getting more electricity, especially when you are on the move such as evacuating. This requires a **DIY** approach of **scavenging for motors** and then **using them as crank generators**, such as by attaching **pedals** from damaged bicycles to them (to power by hand or feet), and **scavenging for 12 Volt lead acid batteries** in cars, motorcycles, scooters, etc.



2. To generate up to **220 V** use a **dryer motor**. They can typically go up to **300 watts**, though some can generate a much higher wattage. See diagrams above to see where they would be located in an average dryer, and also what they often look like. You will definitely need to tools to extract them, and need to do it in advance of any crisis since it won't be quick and easy when you are under duress. For operating it, you will want to use pedals for turning this motor, since it will require a lot of force to turn to this generator's crank to generate so many watts.



3. For a **12V generator of DC current** (to charge your **12V lead acid battery** you will scavenge), get a motor that can be converted. You can look [online](#) for the specs / power rating of motors of your devices / appliances that have a motor. This includes power home improvement tools such as power drills, sanders, etc., or smaller household appliances like **blenders** (often [less than \\$50](#)) and dishwashers. Even **car alternators** can be salvaged to use. You should either find damaged devices/appliances in scrapyards, destroyed homes/buildings, or ideally take them from your own devices and appliances, based on looking up how [online](#), and do it as if you are replacing the motor (which you will plan on doing once you can return safely to your home and power is on).

10. [Other](#)



1. HROC has developed a list of items we are recommending packing in a “**Survival Essentials**” **EvacPac** made especially for Ukraine, based on our research from our team there and our past experiences in U.S. Defense Department work. The EvacPac items fall into categories of what is needed for a group, and what is needed per person. There will be ongoing updates over time.

2. **Needed by group** (see Checklist section above, and Details section below, for more on specs):

1. **Smartphones** (1 kept in **DIY Faraday Cage**), with both car and home **chargers**
2. DIY paint-can **rocket stove** to use as primary heat source (w/ 3 kg charcoal bag)
3. DIY paint-can **quicklime boiler** / cooker / slaked lime maker (find **lime** locally)
4. Electric 220V generator using **dryer** or washer **motor** (get **plug outlet** too)
5. Electric 12V generator using **blender**, drills, or other motors (get **wire** too)
6. **Bicycle pedals** and a **set-up** to connect motors to make crank generators
7. **12-volt** lead acid **battery** (unless you already have a 12V lithium battery)
8. **Thermometer** for air / water and **weigh scale** accurate under 1 kilogram
9. Infection prevention kit that includes **hygrometer**, **pulse oximeter**, [other items](#)

3. **Needed per person** (put into backpacks or rolling luggage for each person):

1. Short garden **hose** “Snorkels” w/**saw** to cut if nec., **cotton balls**, [DIY face mask](#)
2. Two kgs of **quicklime** to use for emergency CO2 removal per person for two days
3. At least 3 **surgical masks**, **glasses**, and one **ampicillin** antibiotics full course

DETAILS SECTION:

**10-POINT CHECKLIST & PROCEDURE for SURVIVAL ESSENTIALS
(CPSE)**

DRAFT (11/7/22 v6): FOR FORTIFYING UNDERGROUND SHELTERS OR IN-HOUSE SAFETY AREAS

P = Problem or Reason, T = Test for the Problem, C = Correction Technique for the Problem

Introduction and Background for this Document:

- Our checklists and procedures have been adjusted in November to the **new reality that there may be [mass evacuations](#) in Ukraine**, given the risk of major cities like Kyiv losing all electricity or energy. This could of course mean **even more refugees to nations like Poland**. But more likely it means going into areas that have lower concentrations of critical infrastructure, less population density, or already bombed to reduce targets for Russia (which appears to be [scarce on munitions](#), though other information may [contradict](#) that view, and in fact the Russians have grown more [brazen](#) and taunting toward war with the West, in spite of **nuclear war risks**).
- The reason evacuations may happen is that the Ukrainian Government has said it may [not be able to recover](#) its electricity grid this winter if shelling continues, and **electricity is needed** for everything from heating, lighting, communications, and even water and sewage. The Ukrainian government, has said it will require Western **assistance for displaced civilians**.
- And the **odds of a nuclear incident keep increasing**, as [Russia didn't take the US phone call](#) meant to inquire on the incident after the Poland missile strike. And [new buyers](#) for Russian energy are emerging that will only strengthen it during this period of sanctions, so it will take working together to improve conservation and alternative energy creation. Both of which are happening right now from what our team is learning and doing in Ukraine.
- For individual people, we know, based on what our team has witnessed, that some, maybe even many, Ukrainians have **woodburning stoves** indoors, and use them – with all the problems and risks they have in normal times and then now. However, we also know that many people do not, and centralized heat is no longer working due to the Russian attacks. That means we must have decentralized, "**distributed**" forms of energy and other Survival Essentials, especially those forms that can be *air-dropped*, if we can successfully help advocate for that type of initiative.
- In terms of breathable air safety, based on interviews in press reporting, it is implied that **people are making fires inside** residences in Ukraine (an [example quote](#) being "...with the situation I have with the windows right now, I am just heating the outside..."). Of course, this is **extremely unsafe**, **but** given it is being done, and **may be the only alternative to freezing to death**, we felt the need to come up with **safer alternatives with safety initiatives** tied to them to at least **reduce the risks of preventable deaths**, which rise each day as winter approaches.
- Thus, our checklist offers alternatives that in many cases are **better than just wood-burning a stove** (as they are not made for **charcoal/coal**, which may be a more easily transportable and "**air-droppable**" form of heat for

evacuees). And we are focused especially on the "silent killers" like air toxicity, and not just the visible ones like drone strikes.

- What may be **most unsettling is that there is significant concern in Ukraine** that [Western resolve may be weakening](#), so our mission is to show that there are many in the West who not only want to help Ukrainians survive, but we want to help others survive in the Western world from what they [learn from Ukraine](#)'s efforts, including civil defense and psychological warfare. Hence, another reason for this **checklist** – the more it is proven, the more the **world benefits**.
- **One example** is that disease will be one result of Russia's decimation of hospitals and other critical infrastructure. Looking at the **respiratory infection prevention** item of the checklist, **why is this important even outside Ukraine?** It is because it has been [suggested by scientists](#) that even boosters being used in the West this winter may not prevent infections and the secondary infections like pneumonia that will arise, especially in an area with limited, overwhelmed, or absent health resources, as well as non-compliant populations. However, our approach has been proven and [published](#) in peer reviewed journals to **increase people adhering to checklists** for early pneumonia care, and applicable to checklists like the Invisible Mask Initiative. In the study, it enabled **better prevention and self-care**, and thus **reduced the need for care in hospital inpatient beds by half**. In a country that was mostly unvaccinated and now largely unboosted to Covid, and with a decimated health infrastructure and winter rise in Covid cases on the horizon for most of the world, **prevention will be key to reducing preventable deaths**. And the approach proposed led to the **reduction of preventable deaths by 87%** when proving key parts of the method were tested by the military to then apply as policy to all of the U.S. DoD, as noted in a [DoD Report to Congress](#) about our team's main project, the **Military Acuity Model**.
- **Another example** of how Ukraine can help the world? Doing the science and innovation needed for **improving climate change and inflation**. Start with the science: Given that the average human consumes when breathing about 550 liters of oxygen, and assuming they generate the same volume of CO₂, [that would be](#) 1 kg of CO₂/person/day. So, we estimate it would take at least **1 kg of quicklime per day per person to offset daily CO₂ increase** in a sealed environment. **Without removing carbon dioxide, cognitive function and immunity are reduced**. How can this apply to the world? **Energy efficiency** typically means insulation and better **sealing** of homes. The **energy conservation** and efficiency **versus carbon monoxide poisoning** dilemma of Ukraine is basically the **heating vs. breathing paradox** that pits price inflation vs. climate change around the world. For example, homes with **energy-efficient insulation can trap CO-polluted air inside**, [as can](#) energy-conserving "airtight" homes with sealed windows. In fact, the rise of carbon monoxide detectors basically coincided with energy efficiency and insulation, and this same principle will be **especially relevant to the world given the climate change and green energy push**. The problem with green energy today is that it has "insufficient joules" (i.e., not enough energy content). Thus, **to meet climate change reduction targets, it will require more conservation** of energy such as from better insulation and sealing in to prevent escape of heating (or cooling in the summer). It **will also require** more options to have **emission-free energy or carbon capture**. One or more of these requirements are needed in order to reduce skyrocketing fuel bills around the world leading to tragic dilemmas ([like whether to buy food or pay for heat](#)), as we are otherwise decreasing the

supply of fuel sources (e.g., away from fossil fuels) while demand has been staying constant or steadily increasing in most areas, which is the recipe for inflation.

- Russia's goals [seem to be](#) to do anything possible to **break Ukraine's will**, even if that means [going nuclear](#) and destroying the nation and its people in the process – but for now it is Russia's methodical attacks [exploiting the frailty](#) of Ukrainian power system that seems to be its preferred escalation to inflict maximum pain. Another goal is to **fracture the alliance** supporting it, such as [false flag operations](#) and disinformation to undermine support. There's already [attacks suspected](#) against Ukrainian refugee sites in Germany. That is why it is **crucial to prepare a plan** to help Ukraine and its allies this winter. And it means an even greater scope of people will need protected from the lack of critical infrastructure and also from future attacks, which is **why HROC formulated these** Survival Essential checklists and procedures.
- As the [NY Times on November 17th reported](#), just within recent weeks, **Russian** missiles and drones have **struck 40% of Ukraine's energy infrastructure**, triggering rolling blackouts across the country. Missile barrages left about **4.5 million Ukrainians without electricity. Eighty percent of Kyiv's denizens were deprived of water; 350,000 homes lost power**. As recent missile strikes show, Russia is not about to let up. The United Nations Office for the Coordination of Humanitarian Affairs reported this month that **six million Ukrainians** are now **"internally displaced"** while an additional **seven million are refugees** abroad.
- The basis of the plan is that flight out of major cities would lead people to smaller cities nearby, or even exurbs/small towns outside those small cities (where there would still be some infrastructure, like roads, water/sewage systems, etc.). But in these areas, **evacuees would likely have to shelter** along the way in abandoned and possibly **damaged homes** in areas around the larger cities already shelled. **Irpin would be an example, given what happened to the city** at the beginning of the war. Hence the reason we are using Irpin as our first example for our approach. In fact, **Irpin is being [observed as a model](#) right now**.
- But this civil defense plan is **not just for current residents of Irpin** that may need to leave in a crisis situation – it is also for **residents** of areas like Kyiv that may be **evacuating out toward areas like Irpin**.
- Just like when trying to **recover from** a natural **disaster**, man-made disasters like war are no different. Beginning to cope with disaster [is a process](#) of trying to **turn chaos into order**. This means **getting organized** using procedures and checklists, **knowing what to do and**, sometimes even more importantly, **what not to do**.
- Given this planning for evacuation, there needs to be **preparation of checklists and procedures**, which should be downloaded / saved on your phone, and then **memorized over time – prefer-ably quickly** in the event your cellphone breaks, cannot be recharged, or does not have room to download all the information (though room should be made by deleting unnecessary data).
- However, there **needs to be also materials prepared and placed into a backpack, carry bag, luggage**, etc., to take with you if you have to leave quickly. We call this "evacuation pack" that you would take with our HROC "EvacPac" (or **EvacPac** for short).
- With the need for heat on the go, there may be a temptation to burn items indoors without sufficient ventilation. **Though we don't recommend this because it is so difficult to make this safe**, it is still understandable when

the only other option is freezing to death overnight as a person sleeps. So, the **key is finding ways to ensure there is a supply of breathable air** that may help reduce the risk of death from toxic air in a sealed area.

- **When you are in an evacuation situation, you can't realistically carry all the household chemicals needed** (e.g., quicklime, bleach, hydrogen peroxide, etc.) **to improve the air's** breathability indoors. In fact, you may not even be able to find or carry the charcoal we recommend as a more potent source of heat (as it has about twice the energy content as the same amount of firewood) found in many households.
- Therefore, there must be more consideration to mobile solutions to what we predict will be the **two (2) greatest causes of preventable deaths this winter in Ukraine: 1. Hypothermia. 2. Lack of breathable air.** The first is obvious, but still difficult to solve. The second is hidden, and even harder to solve. Hence our focus on these two (2) urgent issues moving up closer toward the top of our list to become part of the "Top 5" of the checklist.
- This background is also for government and NGOs to **raise attention** to not only **Ukraine's** dire situation in **toxic air this winter**, but also to where we believe **all the largest risks are that can be mitigated to reduce preventable deaths**, which is our specialty (via checklist adherence) as noted by the U.S. DoD. Displacement is now more likely, and risks now more widespread throughout nation, so **being prepared to be mobile is now crucial**. But that need carries with it **tremendous risks** as well, one silent but obvious (hypothermia), and the other silent and literally hidden (carbon monoxide and toxic air). And **both** during **this winter**, we fear, **will be silent killers**, taking people's lives while they sleep. In summary, **our team has told us Ukrainians have and use wood burning stoves, though not everyone has them.** We also know they are **using freshly cut wood**, not dried firewood, which means **dangerous residue in the exhaust**. Based on the desperate situation, and quotes from people interviewed by the press saying they are "heating the outside," we know **they are burning things inside (at least wet wood)**, which is not supposed to be done. **But** people will view it as they **may have no choice**, so we believe that we **must** at least **find ways to make it "safer"** by explaining in ways that can **alert people to dangers**, and by **offering risk mitigators that could reduce preventable deaths**. That is, this checklist in some parts is for **when there are no good options** (only bad and worse), and for when **outside help won't arrive in time – and something is better than nothing**.

One last note: **Breathable air** is not just necessary **for immediate survival**, it also has other hidden effects that impact near-term and long-term survival. In fact, just to follow a **checklist requires cognitive function**, as the Apollo 13 space mission showed [when carbon dioxide became too great](#) in the capsule. Our CPSE is of course a checklist, but **our cognitive science research** on checklist adherence versus checklist overload has **shown how to maximize adherence**, and as our Department of Defense projects peer reviewed studies show, our team are [experts](#) in cognitive capacity and bandwidth to follow procedures and checklists to reduce preventable deaths by up to 80% or more. What we have learned by working with patients with conditions such as hypoxia, hypercapnia, in a state of panic, or even just highly anxious, is that **without breathable air, you lose** some (and eventually all) of **your cognitive function** as these conditions intensify or prolong. This then **impairs the ability to remember and to think**. Hence why this is our focus – **our approach** strives to be **the key to "changing the way people think"**.

1. Blast Shockwave

P: Comes from Russian-used weapons exploding.

T: Air raid sirens should give enough warning, else stay in your safety area whenever possible, including when sleeping. But if you hear the buzz of a small engine, like a lawnmower or moped, that signals the arrival of an explosive Iranian-made killer drone. You may also see them, since they fly low to the ground, and look like a very small fighter jet.

C: The tasks:

a. The killer drone strikes appear to be aimed at knocking out key electrical infrastructure as Russia tries to make life miserable for Ukrainians. The key is to run to an open area and away from a high-risk target of infrastructure that house or supply many people, since that is the likely target. They will carry payloads of about 400 pounds of TNT (some less, some more), or 0.2 KT.

b. And run away out of the "line of sight" of the drone if possible (e.g., out a back door), or at least perpendicular / sideways from its approach, since it is more likely it is going after a fixed infrastructure or building target than trying to target any one person (but it also may be better to avoid running in a crowd or with a cluster of people all in the same direction).

c. For your blast shelter, use blast shielding made of stacked paper/magazines/books in boxes/plastic (simply put into cardboard boxes – paper piled at enough thickness is surprisingly good at stopping bullets, so it should be able to protect to some degree against blast-related projectiles), and also polycarbonate (PC) layers at about 180 grams, or about a quarter pound, per square foot (gives the strength of 2 inches of steel roughly) behind it. The PC can be obtained from damaged or scrapped bus shelter panes, greenhouse panes, large plastic signs, or playground equipment plastic.

d. Set up your safety area toward the center of the house away from windows and exterior walls, but close to or in the bedroom, kitchen, and bathroom (especially if you have a cast iron or steel bathtub for added protection from blast projectiles). This is because may need to seal your in-house safety area if you can't seal the entire house (including sealing windows and exhaust fans), so you want the most frequently used rooms only.

e. The U.S. Government's FEMA has excellent resources on what to do in the [event of a nuclear blast](#), but a lot of it is useful for non-nuclear explosions also. In terms of what to put inside the "In-House Safety Area" (IHSA), use pillows, cushions, etc. for bedding and then use the mattress and other materials like towels for buffer on the inside of the safety area to help protect from flying objects, or in case you are blown into a wall or the barricade you have made. That is what actually kills most in an explosion.

f. The further from the blast target you are, the much greater your chance of survival. At the detonation point, the wind is 15,000 mph, which is 750 psi (or 9000 psft or 5,171,820 N/m²). This 15,000 mph wind force will unfortunately definitely kill a person. But just small distances of 10 meters from that blast greatly reduces wind speed. For example, 10 meters (<40 feet) from blast epicenter can reduce wind force by 75%, while 30 meters (about a 100 feet) should reduce wind force by 95%. So that 15,000 drops to 750 mph, which is not survivable without some barrier, but still shows

the value of distance (as another 10 meters should get you below the 500 mph limit where a human can survive). And if you are already 20 meters away from the blast and start running into an open field area and lay flat, then you probably experience only a 150 mph = 7.5 psi (or 90 psft or 51,718 N/m²) level of wind, with little harm except a small chance that you may blow out your eardrums, which can be repaired.

2. Blast Heat

P: Weapons exploding also generate heat or fire, which travels farther than blast.

T: Air raid sirens.

C: The tasks:

a. Use heat shielding of drywall / gypsum board, or flame resistant cloth or clothing like polyester found in flame-resistant pajamas or even nylon pantyhose, soaked in water in front of or on top of (the key is to stop the ice cooler plastic from melting or catching fire from the quick blast of heat, assuming you are far enough away that it is realistic to overcome the blast heat) the plastic ice coolers filled with water (or other water-holding tanks) to wet the paper in #1 above from any heat blast, which may otherwise cause it to catch fire in an extreme heat blast.

3. Smartphone Operation

P: Tactical nuclear weapons generate EMP which can destroy smartphones, and maintaining charge in smartphones difficult due to loss of power.

T: If phone doesn't work, then EMP may have destroyed it. Battery indicator on phone of course, but also need testing of the power sources that phone charger would connect to, to ensure can be used to charge.

C: The tasks:

- a. Do not keep your phone plugged into charger beyond 100% charge or if there is high risk of nuclear detonation, as it leads to EMP damage.
- b. To protect the phone's electronics, keep it in any box that has 5 layers of heavy-duty aluminum foil wrapped around it, as that shielding creates basically a Faraday Box.
- c1. For power, ideally use a crank generator, like HROC has sent to Ukraine to test and which worked excellently for smartphones (<https://youtube.com/shorts/3IJkSam1r8>), but you can also build a dynamo from a small motor (https://www.youtube.com/watch?v=a6HI_Q_wtI8) or from scratch: <https://www.youtube.com/watch?v=ko57rGOXGGg>), getting the copper wire needed (since wire generates electric flow when it goes through a magnet) from old or damaged transformers such as near bombed electrical substations, as they contain a lot of copper wire.
- c2. Or if that is impractical, then you can make your own battery, with the power stored in a lead-acid battery from metals you can find around a house and vinegar, or better yet, bleach (using the links noted in the Main checklist). As added detail, this vinegar battery [http://hilaroad.com/camp/projects/lemon/vinegar_battery.html] could be the way to charge a smartphone via a scooter battery, and a phone charger for car. Try vinegar at highest percentage and white ideally, then also try bleach (though more dangerous), with copper from wire turned

into a mesh connected into one wire. Then either galvanized steel like from a bucket cut into strips, or use aluminum foil worst case. Three of them these in series is 2.5 volts, with amps that should offer a trickle charge to your lead acid battery. Add more in parallel to increase the amps. How long does a vinegar battery last? 6 months when unused. 6 hours when continuously used according to the online source. The alternative is a bleach battery, to get more voltage and amperage. For example, according to the online source describing how to make the battery [<https://thesurvivalmom.com/wp-content/uploads/2012/12/homemade-batteries.pdf>], the more bleach you use the more amperage you will get, but the faster the metals will corrode. The idea is to make your batteries where they only need to be refueled once every 3 months or so, and the metal will corrode very little. To do this you will need to use a teaspoon of bleach to every gallon of water. But this will not be enough amperage to do anything with so what you must do is add many cells together in series. The Aluminum will corrode faster than the copper. To keep your battery system working at it's best, it is suggested that you take out and clean the metals with water and lightly sand the copper ones and then replace them back into the containers every 3 to 6 months. Use preferably old aluminum cans (sanding off any coatings that may be on the inside, or paint on the outside, until you're sure you have metal), but you can try aluminum foil wrapped around plastic. Finally, the aluminum can will be the Negative electrode for the DC current, and the copper pipe will be the Positive electrode.

Sources of copper for your battery: The most [common home use of copper](#) people have come to know is its use in both electrical wiring and in copper pipes used for the plumbing in most homes. For copper wire sources to make your own generator, or for large amounts of copper needed to make carbon monoxide converter, use wire from damaged transformers. **Sources of zinc for your battery:** In [galvanized steel](#), the pure zinc coating is thin, up to a maximum thickness of 1 mil (25 μm , where a mil is a thousandth of an inch — .001 inch.), and mechanically bonded to the surface with a hardness of about a third to a half that of most steels.

d. Uneven power does not matter when charging a lead acid battery to then power a smartphone. But to fully charge it will need at least 2 amps over some period of time. Most phones require at least 4.8 volts to charge while some can do 4.4V from the battery. But if you use a crank-generator (cranked by hand or a pedal), then anything above 2.15 volts per cell should charge a lead acid battery. This should be enough to keep your smartphone charged for use during a crisis, when power is inconsistent or unavailable.

4. Hypothermia

(Please note that this checklist item is when you are in a life and death situation only. That is, where you don't believe you can survive otherwise. It has significant risks if done incorrectly, and thus you, and any group of people with you, should do a lot of preparation, including test runs.)

P: With energy shortages throughout the world, getting fuel for heat will be difficult, especially if there is an escalation of attacks, including nuclear attack. This procedure is for when people are feeling very cold, either by what they say, or if they are shivering. This often means it is very cold (under 20 degrees

Fahrenheit or -7 degrees Celsius) and you are facing **hypothermia -- which is a silent killer in your sleep**. Thus, you “feel” compelled, literally (as the first sign of hypothermia for you or your family/friends in your group, is actually shivering), to burn carbon-based fuels in your location. There is also the real risk and added complication of when you are or are becoming short of fuel, and / or residing in a damaged home or dwelling that leaks heat. You may be low in fuel because it simply isn't available, but it could also be that it is dangerous to try and find fuel (e.g., if you are in areas that may have minefields or should not be seen in the open during the war). This then leads to the obvious danger of hypothermia, so then retaining heat is critical -- which means sealing your living area for the night. Coal has twice the energy content of firewood, but it comes with hazards as noted in #5 below. And Ukrainians can't wait till wood dries, so that presents more hazards.

Additional background for hypothermia, war, and civil defense (i.e., outlasting your enemy when you are both at risk of freezing): Throughout history, [hypothermia](#) has been a disease of war, but is often thought of as refugees freezing near campfires, but it [also applies to troops](#), such as Napoleon's loss of nearly half a million men when he marched on Moscow in 1812, which was over 95% of his troops for that battle. Similarly, Nazi Germany after attacking the Soviet Union in World War 2 and during its drive to take Moscow at the start of winter 1941 had 100,000 troops (which was 10% of the entire German army) be debilitated by cold-related injuries, of which 15,000 needed amputated.

T: BEFORE: Find where cold air could seep into the house via drafts by walking around the walls with a candle to see where there is flickering, as well as by also feeling for the colder areas of the house and windows/walls, which will also help find where to reduce leakage of heat. DURING: See if anyone is persistently shivering.

C: The procedure to reducing hypothermia involve 2 main processes, with several **tasks** underneath each one:

1. **HEAT CONSERVATION PROCESS.** You need to insulate a small area where you are resting for the night or residing for days to ensure you can keep warm enough to prevent hypothermia. The tasks:
 - a. To do this, find the smallest possible room where everyone will fit and that has the least damage, holes, and minimal (but at least one) window to the outside. (Note: If you are not in a small location, because you can't find a small room, then at least make it small such as by building a tent, or at least something like a tent. Why? The human body itself is a heater, and generates 100 Watts of heat every second that can gradually warm a small area if the area is sealed well.)
 - b. Then focus on finding any obvious holes in walls, around doors, but also windows and wherever there are drafts, which you can find by walking around with a candle and looking for flickering.
 - c. The largest source of heat loss on undamaged, well-built but old homes is windows. Insulation that we recommend that is fast to do DIY is using clear plastic wrap, cardboard from a cardboard box for a frame of the size you need to cover the window or the air leak, and tape, to then create a "double-paned, plastic wrap insulator" with a 3.5 inch air pocket between the sheets of plastic <***see link giving a visual like a sketch>. Note it is 2 layers of thin plastic wrap (or just one if you have thick plastic wrap) on each side of the 3.5 inches or more in depth, or about the length of a long finger or palm of your hand>, and do this for all windows in the room and

any drafts found (by using candles) in the room, as well as sealing the doorways, to maximize insulation as well as protection from radioactive dust (this should also be repeated for the bathroom, and the passageway in between).

d. However, around doors is also an issue. Use stuffing in the form of rags, or even paper towels, tissue paper, or newspaper to block air flow and heat loss. Also, a "[vestibule](#)" made of strips of plastic wrap anchored to the ground with something heavy to reduce cold air rushing in when people open the door.

e. There is also the issue of the usual leaks in rooms, such as by corners of rooms, when joints can lead to poor seals. To reduce these leaks, or any wall that is noticeably colder than the surrounding area (e.g., due to a leak on the outside wall), then use garbage bags filled with about 6 inches of shredded paper.

f. Doing these items have been proven by one of our scientists to reduce heating energy costs by 30%, so estimated usage of scarce fuel dropped by almost one-third. Once you have used tape/tacks on plastic to create an air pocket onto heat leaks, then focus on generating heat in a way that can remain safe (i.e., does not generate toxic gases or deplete oxygen), since airtight residences present a risk – e.g., heat sources with inadequate air flow can lead to dangerous levels of CO in the air, and when inside an energy-conserving "airtight" homes with insulation and [sealed windows that can trap CO inside](#). See checklist #5 ("Breathable Air") to address this problem. In fact, this situation may require having to warm people up inside for a period with the potentially toxic air for 5 minutes, then having them go back out to get fresh air, if getting heat is that urgent, in spite of the fact it could also be deadly (though not having enough heat is also deadly, such as when core body temperature drops below 85 degrees F).

2. PORTABLE HEAT GENERATION PROCESS FOR MANY TYPES OF FUELS.

Make a portable stove that can burn virtually anything, and more cleanly and with less risk (though there is still of course risk) than just trying to make campfires or use wood-burning stoves. The tasks:

a. We recommend making a "rocket stove" (which has a separate air intake on its side that makes it look like a rocket) which can burn carbon-based fuel more cleanly (as it brings in air from underneath the combustion area, similar to a barbecue grill). This is especially necessary for the charcoal (or worst case coal if no charcoal, which burns more cleanly, is available). It is important to realize that charcoal/coal can't be burned safely inside a wood-burning stove, since it does not have air coming in under it, and thus burns incompletely, leading to more carbon monoxide.

b. If you can find, and are able to carry the charcoal, we recommend it as a more potent source of heat that is relatively safe and mobile (and could even be airdropped). A rocket stove can also more easily burn various items, to start the burning process of charcoal (typically takes at least 10 minutes of other items burning to start it burning), to then generate heat for at least an hour (all the way up to 5 hours in some cases), from a single piece of charcoal.

c. But if you can't find or take any, then you may have to rely on fuel you find along the way, such as wood, twigs, or even cardboard and paper. But remember, the wetter the fuel (e.g., undried wood), the greater the chance of smoke, as well as residue that will build in your exhaust – and which will lead to buildup of exhaust and thus toxic air in your room.

5. Breathable Air (a problem when sealing to conserve heat or block radioactive fallout)

(Please note that this checklist item is when you are in a life and death situation only. That is, where you don't believe you can survive otherwise. It has significant risks if done incorrectly, and thus you, and any group of people with you, should do a lot of preparation, including test runs.)

P: As noted above, hypothermia is a silent killer, but there is an even less obvious, more hidden danger. With fuel shortages and nuclear fallout risks, you will need to seal the small location you are in, so you are not just heating the outside, and / or need to worry about radioactive dust, and this is where a higher risk of death from carbon monoxide poisoning arises. Even less known is the risk of toxic air developing from a loss of oxygen in the air (which in a sealed, large shelter holding 100 or more people can turn toxic in less than a day even without burning any fuel inside), or a buildup of carbon dioxide, which in the same shelter can go toxic in less than 3 days without any fuel combustion.

T: Symptoms from our health checklist for hypothermia from our sealed area checklist and for other toxic or harmful air from our ventilation checklist.

C: There are 3 main **processes** that will need to be done, with first being most important, but 2nd being recommended also (the third process will be difficult to do if you are mobile, since they require constant raw materials):

- 1. Constant monitoring for toxic air detection, and immediate corrective action, by members of a group.*
- 2. "Snorkeling" in toxic air, getting fresher air via a DIY gas mask with valves and a hose.*
- 3. Transforming toxic air through a combination of raw materials, in addition to basic chemistry, physics, and math (all of which can be done on your smartphone). We call this process the "Invisible Mask Initiative" (IMI).*

And here are the processes with their **tasks**:

- 1. CONSTANT MONITORING.** Getting sleep is critical for maintaining your immune system as well as your sanity, especially during a crisis. However, it is important to have people monitor at all times for the "silent killers" (i.e., those conditions that lead to people dying in their sleep without warning) of hypothermia, such as by looking for shivering or skin/lips turning bluish, and also carbon monoxide, such as by checking themselves for signs of poisoning.
 - Buddy system sleep shifts. Thus, if you have 3 or more people, then ideally you should take turns having two (2) people always ready to stay awake, doing a shift at all times so everyone can get some sleep even under extreme conditions. That is, there should always be a "buddy system" to make sure neither falls asleep.
 - Checklist monitoring. These "buddies" would monitor themselves, then each other, and finally the entire group, in their sleep for symptoms in our shelter checklists for sealed areas (see our ventilation checklist link in Main checklist) as well as ventilation (see our ventilation checklist link in Main checklist), looking for any symptoms on that checklist, then taking immediate corrective action as noted in the checklist.
 - Daytime sleeping. And sleeping in 5 to 6-hour shifts during the day, when temperatures tend to be higher, is also recommended. There have

also been occasions where missile fire appears to be less during certain parts of the day, and increases at night, so that is another advantage.

d. Wake-up alarms for self-checks. If there is only one of you, then it is even more dangerous, since there is nobody to monitor themselves and others at all times. Therefore, it is important to use your smartphone to try and awaken you periodically to assess yourself with the checklists of symptoms.

2. **“SNORKELING” THROUGH POTENTIALLY TOXIC AIR.** After sealing a location against the cold or nuclear fallout, it reduces ventilation. In this scenario, there can be fatal doses of carbon monoxide (CO) -- which is also a silent killer when people sleep -- when burning anything indoors to get heat. The problem is the more the air gets depleted of oxygen, the less completely things burn, meaning more CO. In a sealed room, each person will consume roughly 550 liters of each day from the room’s air. That also means a loss of oxygen is inevitable in a sealed room’s air, even if nothing is burning. Burning or just breathing will then also lead to the buildup of toxic levels of carbon dioxide (CO₂). This means there has to be a way of getting fresh air for the lungs while keeping heat for the rest of the body. Here are the tasks that can help one do that:

a. You will need to make a face mask, similar to this [gas mask procedure](#), using a 2-liter soda bottle, up till step 5 of that procedure. However, you may want to use yarn or string to hold on the bottle if a mask holder will not work.

b. Then, if there is only one of you, you can carry in your *HROC EvacPac* to use while mobile due to evacuating, a relatively thin-walled **garden hose** in order to get external air to your lungs from the outside (or at least from other, unoccupied rooms if opening windows are too dangerous due to recent nuclear attack). The garden hose can screw into the bottom of the bottle since, at least in the U.S., thread sizes of hoses and 2-liter bottle caps are the same based on our tests. You want the hose thin so that it can gather heat from the indoor surroundings before the air gets to your nose, to make sure it heats the air you breathe in to above 20 deg F, or -10 deg C. Anything below that temperature is dangerous to the respiratory system and can damage it with prolonged exposure.

c. In addition to the garden hose to its end, the gas mask, though, should have at least 2 important **valves** made using balloons as the rubber needed for a seal like the rubber valves found in other masks (while also using some amount of petroleum jelly to moisten it at the valve edges):

1. An intake valve, similar to a **dry valve** in snorkeling, for your exhaled air with CO₂ to not go back into a long hose going outside, else the air you would breathe in from the hose gradually becomes toxic as CO₂ builds from what you exhale back but that can’t reach the outside (similar to trying to breathe water, which will drown you, so hence why we chose a dry valve). Basically, this valve blocks unbreathable air you exhale from coming back into face mask to breathe again.

2. An exhaust valve similar to a **purge valve** in snorkeling where exhaled air will be pushed from your mask into the room (which is already filling with carbon dioxide, and maybe carbon monoxide and confronting oxygen depletion if items are being burned in the sealed room, or lots of people are in the sealed room, which is assumed to be already growing too toxic to breathe (similar to trying to push out water, which would otherwise drown you, from your mask, so hence why we chose a purge valve). This

lets the carbon dioxide out into the room without letting the room air come into your mask.

WARNING: THESE VALVES ARE CRITICAL to safe operation of the snorkel system, otherwise unlike water, you will not know until it's too late that you are drowning from toxic air (since you would pass out first), and thus the full mask-hose-valve apparatus must be tested for usability (e.g., try napping in your DIY version) before you use them in a crisis situation. If there are any doubts, you must resort to the short hose (basically 3 feet or less), and sleep right next to the window to reduce the risk of CO2 buildup in the hose. But the short hose also risks bringing in air that won't have enough time to warm so is dangerous if the temperature will be below the -10C / 20F outside, which is once again another reason not to sleep at night when it's coldest, but rather in the day, when it's usually less risk of extreme cold.

d. The hardest part is the hose, which requires anchoring, both to your waist <***link to pic to show how uploaded>, then duct tape (or tie with yarn or string) and some padding around you for comfort to hold it in place and reduce pressure from its weight on the mask that would risk pulling it off or leaks around your face.

e. Then you need to attach to a window, and have a 3.5 inch air pocket via a "double-pane plastic wrap" on the window to maximize insulation. Note the hose before it reaches the window will need anchoring, such as via books, or even rocks, to hold the hose in place at the window and not tug it away from the plastic and tape you will put to surround it for the seal.

f. If there is news or any signs of radiation (see our radiation test link in Main checklist), then you must filter radioactive dust (which is simply regular dust that is also carrying radioactive isotopes) from your snorkeling device. This requires at least 2 cotton balls at opening to serve as a filter for the dust, and paper clip removal handle (see the shape the clip is bent in the Main checklist), changing at least every 3 hours if possible by bringing the tube inside, sealing the hole temporarily in the window plastic, taking the cotton balls out to then put into a bag immediately, then to push that bag out the hole in the window, then replacing the cotton balls and putting the hose back through the hole leading to outside from the window.

g. You can vent the air inside the room you are in to alleviate the toxicity in the afternoon when the temperature of the air is highest (people may want to go outside for sun anyway) BUT IT IS SAFE ONLY IF:

1. There is no nuclear fallout
2. It is not dangerously cold out
3. You are dangerously low on fuel
4. You don't have to hide your presence from enemies or from wild animals, etc.

Again, BE SURE to test all this beforehand and have the apparatus and process ready.

3. INVISIBLE MASK INITIATIVE (*Optimal approach if able to stay in home for extended period of time*)

a. Carbon Monoxide

P: Portable generators will likely be used to make up the electricity shortage -- but they emit more carbon monoxide than a traffic jam of 450 cars.

T: CO detector, or we are working on a "CO blood drop test" if an actual carbon monoxide detector is not available. Worst case, using math calculations tracking the consumption of gases in the room's volume of air may be the only proactive way of addressing this issue, since looking for danger signs from health symptoms are only reactive and become the warning of last resort.

C: Copper plate of sufficient size heated to 250 degrees Celsius, with a spinning steel wool brush on the copper plate, built to HROC specifications and safety standards (else is highly dangerous), including mandatory carbon monoxide detectors in case rate of CO production exceeds rate of CO removal from air. More on this approach will be described in a future update.

b. Carbon Dioxide

P: This is created both by generators or burning anything wood or petroleum products as fuel. It is also created by people, and can reach toxic levels from that alone in a sealed shelter in less than 3 days.

T: Any slaked lime gets cloudy with air containing CO₂ bubbled through it, and if at certain level in the air, then a certain amount of slaked lime will yield fixed amount of limestone sediment (https://www.youtube.com/watch?v=VI9A8lyc_LY shows how slaked lime captures carbon dioxide).

C: Enough slaked lime will capture the CO₂ and trap it as limestone sediment in water.

c. Oxygen

P: This is consumed by generators, burning fuels, and also people -- and it can run out in less than a day inside a sealed shelter.

T: Acetone & White Vinegar treated steel wool tests for quickly, as does in combination a pulse oximeter device noting drops in O₂ levels across people in the shelter or IHSA.

C: Using 35% H₂O₂ (i.e., food-grade hydrogen peroxide) poured on warm silver plates, stirring until no more bubbling (i.e., release of oxygen). However, if silver is not available, use bleach, which is typically 5% sodium hypochlorite. But that also means you will need 7 gallons of bleach for every gallon of H₂O₂ (35% concentration) to ensure all the oxygen is released in the reaction. Be sure to slowly mix together, since together it is very reactive, yielding oxygen bubbles that are visible, but sometimes even explosive. Be sure to start small.

Moreover, our approach of snorkeling will also help protect against smoke inhalation, since creating electrostatic smoke filters are difficult, and since a filter made of surgical masks or a wire mesh thin box of cotton balls, which is then attached to a fan, is more challenging, and not adequate for high smoke situations as one may find with indoor stoves and fireplaces. When smoke moves into the lungs, it penetrates the respiratory system's protective filters, sticking there. What makes this so dangerous are the toxic gases, such as carbon monoxide, which can replace oxygen in the bloodstream. The primary way smoke inhalation kills is through [suffocation](#) from a lack of oxygen.

Critical recap for this checklist item: If valves you make are not working well enough for inhaling or exhaling, or can't be made, then must use shorter (or cut to 2 to 3 feet) hose, and thus you will likely need to lean against the wall near the window to sleep, but making basically, inside the room, a self-made tent with insulation in the space to conserve heat. Also, you should heat the hose by wrapping it in copper wire that is insulated and conducts heat from stove to being wrapped around the hose. If too difficult to breathe through 2 cotton balls, then go to 1 but with more risk, or just part of 1 - some protection is better than none.

6. Radiation

P: Tactical nuclear weapons are meant to kill or disable people from radiation.

T: BEFORE: In advance of nuclear cloud risk detection of ways radioactive air could seep into the house via drafts by walking around the walls with a candle to see flickering, as well as by also feeling for the colder areas of the house and windows/walls, which will also help find where to reduce leakage of heat.

DURING: Static electricity is absent outside alerts you to the radiation cloud arriving and when time is of the essence to prepare for the 72-hour sheltering.

C: The tasks:

a. Tape or tack on plastic with air pocket onto the heat leaks.

b. Also use humidity in the room to reduce risk of radioactive dust hovering.

c. Set up your safety area toward the center of the house away from windows and exterior walls, but close to or in the bedroom, kitchen, and bathroom. This is because may need to seal your in-house safety area if you can't seal the entire house (including sealing windows and exhaust fans), so you want the most frequently used rooms only.

d. After nuclear detonation or event (it is too risky to do before it happens since the concrete or ice coolers can become projectiles for the explosion's shockwave), then work on the radiation shielding for your bedding area and where you will spend most of your time waiting out the 72 hours after nuclear fallout arrives at your location.

e. Shielding walls to protect from up to 80% of the radiation can be done using concrete blocks (3 high, 2 wide), or ice coolers (2 high, 1 wide) filled with water in the area. This means 102 cinder blocks (at a weight each of 35 pounds), so about 3500 pounds, or over a ton and a half, but less than 2 tons. Or even better (since water is useful as a buffer, to protect from heat by dousing fires, and can be drunk as well if water is needed in an emergency) is the use of 34 ice coolers filled to the top with water, or about 12 gallons each, with each gallon at about 8 pounds, or 4 kgs. So each weighing about 100 pounds, so a 3400 pounds, so slightly less than concrete blocks. If you are unsure whether your floor can support this amount of weight, then if you have a garage, then this weight will be around the weight of a car, and also these coolers/blocks will be more distributed, so less weight per square foot.

f. If you are in a 2-story house, you should also have a shielding ceiling (for particles that may settle on the roof, though gradually wind should blow more and more of it off the roof to instead settle on the ground), consisting of a layer of water at least 3.5 inches or more deep right above where your bedding area is on the ground floor below. This water can be held by an old or cheap waterbed mattress if available, otherwise, improvise with a frame, a rubber mat under it, and garbage bags filled with water.

g. Stay sealed from outside air, and shielded from radiation's gamma rays, for at least 3 days.

7. Respiratory Infection

P: This is usually a top-5, even top-3, killer in cold climates. In closed spaces like shelters, especially when they are mixing many people, the risk of transmitting Covid, flu, and other diseases that can result in pneumonia and then sepsis (i.e., a serious bloodstream infection) is high.

T: Static electricity is present inside, since that indicates dangerously low humidity, which will dry out your immune system's first line of defense – your mucous membrane.

C: The tasks: (from the original [Invisible Mask Initiative research](#) done with HROC's Canadian office)

a. There are ways to [make your own](#) pulse oximeter – [more than one](#) in fact.

b. If low, then need antibiotics, with the one most likely to help for respiratory infections in war being Ampicillin. You can also, worst case, [make penicillin](#) to see if it can help in a crisis.

c1. Evaporative humidifier if no energy but have water.

c2. Or boiling water if already boiling for other reasons (e.g., water sterilization) or air very dry and must humidify quickly.

d. In order to ensure prevention of infections that can snowball and lead either to preventable death, or a lot of suffering for the patient, their family, and those tending to or concerned about them, it is important to make sure the checklists are followed. This is the purpose of HROC's Cooperative HRO, and putting it into place in prior pandemics helped during the Covid pandemic as well. [This article](#) on the CHRO (which is highly applicable in war-time scenarios) explains how to put one in place for a medic unit inside a shelter.

8. Contaminated Water

P: Given loss of critical infrastructure, consistent safe water will be more difficult to get. Boiling water (which can also heat frozen food and cook food for safety) is key in a nation facing a cholera outbreak, as the critical infrastructure decimation inevitably will affect water and sewage treatment [<https://www.nbcnews.com/news/world/mariupol-ukraine-alarm-cholera-outbreak-russian-occupied-rcna32254>].

T: Cloudy, brownish, fishy or rotten odor, strange taste of water.

C: The tasks:

a1. Heat with rocket stove, using the fire generated within it to boil the water for at least 1 minute at a rolling boil, where bubbles are moving within the water.

b. Heat with quicklime (CaO) to a rolling boil for 1 minute (<https://www.youtube.com/watch?v=yg1FYLx7AU4> is a link showing boiling of water with quicklime), but since you can't monitor it in the quicklime boiler we've constructed DIY, you will more likely have to rely on it generating a temperature of even a just 160 degrees F for 5 minutes (which can be tested with a thermometer once the fizzing or popping of steam stops inside the boiler can). This 160 degrees F should kill 95% of microbes.

c. Then filter with bag of cotton balls or crushed charcoal in clean cloth, or even coffee filter if just need bigger particles removed from the sterilized water.

9. More Electricity – Faster

P: To charge beyond smartphones

T: You simply need more electricity than the charging of a smartphone, such as for computers (30 Watts or more), lighting at night (50 Watts or more), water purifiers (100 Watts or more), and even drones (150 Watts or more).

C: The tasks:

a1. The crank generator sent to Ukraine (150 Watts).

a2. Or generator made from washer / dryer motors (find links online on how to remove and use these motors safely, as they can generate up to 300 Watts (which is enough to even power most drones), when connected to pedals from damaged bicycle, or from even smaller motors found in fans, etc. To explain further, these generators that are for 220V AC (i.e., used in Europe) can be made from dryer motors [<https://sciencing.com/make-simple-generator-6643319.html>], and how to remove the motor from the dryer can be found online [<https://www.youtube.com/watch?v=LAeMJnXbmhc>]. After this, instead of the dryer, you can "turn lemons into lemonade" and dry clothes on a clothesline through the winter -- offering some much-needed humidity in the process for closed heated areas that tend to get dry. Then for smaller devices that can be charged in cars, like smartphones but also even laptops with the right inverter/transformer), use motors that can run from a 12-volt battery, to then charge a 12V lead acid battery (else use a transformer, worst case making one with a lot of copper wire):

a3. Or from a [converted car alternator](#), powered by hand, pedal, or turbines to wind or water.

b. Then once generating power, store it in a lead-acid battery, such as from a car, or even motorcycles or scooters/mopeds.

Recap: If electricity goes out for extended periods of time, remove the washer or dryer motor, since you can't use it anyway, make a generator, test it, then pack it (Note: Be careful to make it easier to put back in later). Also, when packing it, keep all phones, laptops, and anything with a hard drive away from any motors, given the magnetic field, or you may accidentally important erase data.

10. Other

Pack an *HROC EvacPac* for evacuating in a hurry to other areas. This should include items in our health kit and other items below:

Needed by group (see entire document for more on specs):

10. **Smartphones** (1 kept in **DIY Faraday Cage**), with both car and home **chargers**
11. *DIY paint-can **rocket stove** to use as primary heat source (w/ 3 kg charcoal bag)*
12. *DIY paint-can **quicklime boiler** / cooker / slaked lime maker (find **lime** locally)*
13. *Electric 220V generator using **dryer** or washer **motor** (get plug **outlet** too)*
14. *Electric 12V generator using **blender**, drills, or other motors (get **wire** too)*
15. **Bicycle pedals** and a **set-up** to connect motors to make crank generators
16. **12-volt lead acid battery** (unless you already have a 12V lithium battery)
17. **Thermometer** for air / water and **weigh scale** accurate under 1 kilogram
18. *Infection prevention kit that includes **hygrometer**, **pulse oximeter**, [other items](#)*
19. *6 or more heavy-duty plastic trash bags*
20. *As many magazines/newspapers that can fit (to be shredded for insulation, kindling, and worst case used as primary fuel) [NOTE: If staying at home in your own IHSA, then large quantities of magazines and books, or reams of paper, can serve as blast shielding]*
21. *1 luggage/bags on wheels (to carry the heavier items if have to walk)*

3. Needed per person (put into backpacks or rolling luggage for each person):

4. *Short garden **hose** “Snorkels” with a **saw** to cut the hose if necessary, **cotton balls**, and the DIY “snorkeling” [face mask](#)*
5. *Two kgs of **quicklime** to use for emergency CO2 removal per person for two days*
6. *At least 3 **surgical masks**, **glasses**, and one **ampicillin** antibiotics full course*

(Note: There will be more added over time to this last entry, over time)