SY-09 The salvage list and the first year: a bootstrap sequence for a household and a village

HEALING after the FALL, research library, SY-09

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

1. Findings by section

This report gathers what the library already knows into one order of work. It runs from the first week to the end of the second year, for a household of six and a village of 300, with a district of 3,000 at the edge. It adds little new evidence. Its job is to put the library's protocols in sequence and show which step depends on which. The sources are the library reports cited by ID, plus FEASTING after the FALL, the owner's earlier book. Primary studies appear only where a library report has already read them, marked "via THRIVING library".

1.1 The window may not exist

Every salvage plan assumes a window, a period in which shelves are still full, roads are passable and nobody else has emptied the pharmacy. The library's salvage report gives a seven-day route ordered by what fails first (THRIVING library, ME-09). Nothing in the library measures how long such a window lasts after a real collapse, and the honest answer is that it may be hours, weeks or nothing at all. Pharmacies are among the first places looted in civil disorder, and controlled drugs go first [VERIFY].

The sequence below is therefore built so that it still works if salvage yields nothing. The first month (water, latrine, soap, sickroom, register, handwashing) needs no salvaged drug at all. The garden needs seed, and seed is itself a salvage item. The still needs copper and fuel. Training needs only time and two willing adults. Salvage multiplies what a trained village can do. It does not replace the training, and a village that spends its first week on a pharmacy run while nobody digs a latrine has the order wrong if the run fails.

The rule for the reader is simple. If the window is open, run the salvage route on days 0 to 7 with a small team while the rest of the village starts the first-month work. If the window is closed, skip to the first month and treat every later find as a bonus to be logged.

1.2 The first week: salvage by lives saved and shelf life

ME-09 ranks salvage items by a score of 2L + B + 2R + S out of 30, where L is lives saved, B breadth of use, R the risk of doing without and S the shelf life. Drugs that cure outrank drugs that buy time. The top ten are amoxicillin, gentamicin, ceftriaxone, ketamine, lidocaine, doxycycline, syringes and needles, misoprostol, artemisinins and magnesium sulfate. Ranks 11 to 30 run through tetanus toxoid, metronidazole, co-trimoxazole, prednisolone, oxytocin, epinephrine, tranexamic acid, phenobarbital, atropine, rabies vaccine, diazepam, albendazole, TB drugs, zinc, chlorhexidine, furosemide, salbutamol, naloxone, ivermectin and carbamazepine. Insulin falls below the line because a village cannot keep it cold or make more of it (THRIVING library, ME-09).

The route goes by what spoils first. Fridges on day 0 to 1, because every hour above 25°C counts and nothing may freeze. Hospital pharmacy and theatres on days 1 to 2. Pharmacies and wholesalers on days 2 to 3. Dental surgeries on days 3 to 4. Veterinary practices and farms on days 4 to 5, with everything marked VETERINARY in red. GP surgeries and care homes on days 5 to 6, and households only by agreement [OWNER]. Day 7 is for inspection, quarantine and the log. Nothing is used unlogged (THRIVING library, ME-09).

Shelf life is better than the label for most solid tablets. The US Shelf Life Extension Program extended 88% of lots, by a mean of 66 months, though 16% eventually failed. A cache of drugs found in a pharmacy and tested after 28 to 40 years still held 11 of 14 ingredients at acceptable strength (Lyon 2006 and Cantrell 2012, via THRIVING library, ME-09). The exceptions matter more than the rule. Unopened insulin keeps about 6 months at 25°C and 2 months at 37°C. Oxytocin loses 3 to 7% a year at 21 to 25°C and 9 to 19% at 30°C, and 45.6% of samples worldwide already failed assay before any collapse (Torloni 2016, via THRIVING library, ME-09). Misoprostol in a damaged blister lost 48.2% (Hagen 2020, via THRIVING library, ME-09). Tetanus toxoid is ruined by freezing. Carbamazepine passes assay but stops dissolving, so phenobarbital is the antiepileptic for a decade.

Veterinary stock carries concentration traps. Horse ivermectin paste is 18.7 mg/g, about 113 mg a syringe, against a 3 mg human tablet. Veterinary oxytocin may be 20 units/mL against human 10 IU/mL. Ketamine comes at 10, 50 or 100 mg/mL. Lidocaine 2% is 20 mg/mL (THRIVING library, ME-09). Every veterinary item is relabelled in red with its strength per mL or per gram before it enters the store.

Storage on day 7 follows OR-06 and ME-09: 0 to 30°C, below 25°C where possible, humidity 65% or less, shelves 60 cm from walls, first expiry first out. Multi-dose vials are discarded 28 days after the first puncture (THRIVING library, ME-09, OR-06).

Seed belongs on the salvage list though ME-09 does not rank it. The garden depends on it (THRIVING library, OR-02), and so do FEASTING's kitchen garden and grain. A garden centre, a seed merchant or a farm store visited on day 4 to 6 can supply a decade of herbs. This is my inference [VERIFY]. Copper pipe and vessels free of lead solder (for the still), a pressure cooker, lye, glycerol, bleach, thermometers, a hanging scale and paper also belong on the list (THRIVING library, ME-03, OR-04, OR-05, HY-05).

1.3 The first week at home

A household of six has a smaller job. It checks what it already holds, counts it and locks it. OR-06's household shelf has ten items: soap (4 bars), oral rehydration salts (6 sachets), paracetamol (20 tablets), 10 boiled cloths, 2 roller bandages, iodine or salt, tweezers, scissors and a needle, a thermometer, a lockable box and a contents card. No antibiotics, iron or controlled drugs at home [OWNER] (THRIVING library, OR-06). The rule exists because unit-dose packaging cut child iron deaths in the United States from 29 to 1, and a household bottle of iron tablets is the most dangerous object in a house with toddlers (via THRIVING library, OR-06).

The household also counts sedatives and alcohol on day 1. MI-06 asks every household to count benzodiazepines and opioids on the first day and taper rather than stop, because withdrawal kills, and expects about 5 to 10 dependent drinkers in a village of 300 [VERIFY] (THRIVING library, MI-06). FO-01 adds that the first year's deaths come mostly from lost chronic drugs and from the old: about 0.5 to 1 insulin-dependent death and 0.2 to 0.3 dialysis deaths per village (THRIVING library, FO-01). These deaths cannot be prevented by any sequence in this report. The household's job is to know who is on which drug, how many days remain, and to plan with them.

1.4 The first month: water, latrine, soap, sickroom, register, handwashing

The first month builds six things, and they depend on each other in a fixed order.

Water first. A sanitary survey of every source in week 1 (THRIVING library, HY-02). Chlorinate with a 1% stock at about 4 mL per 20 L, or boil, which costs about 0.3 kg of wood per litre. A biosand filter takes 30 days to ripen

and is a month-two job. Nothing else in the month works if the water is fouled.

The latrine second. Pits sit at least 30 m from any water source, downhill, and with 1.5 m between the pit floor and the water table. A pit fills at about 60 L per person a year, so a household of six needs about 0.36 m^3 a year and a village of 300 about 18 m^3 (THRIVING library, HY-04). The gain only shows once 50 to 75% of households use one, so a village latrine drive is a whole-village job, not a household choice.

The handwashing station third, beside the latrine and beside the cooking place, with soap or ash as the fallback. HY-01 puts the effect of soap at about a 30% cut in child diarrhoea and the use at about 4.4 g of soap per person per day in the Karachi trial (via THRIVING library, HY-01). The five times are after the latrine, after cleaning a child, before preparing food, before eating and before feeding a child. Compliance decays within weeks unless someone checks.

Soap fourth, because salvaged soap runs out. HY-05 gives 130 g of sodium hydroxide or 185 g of potassium hydroxide per kg of fat. A household of four uses 10 to 15 kg of fat a year for soap, and the dispensary alone needs about 45 kg (THRIVING library, HY-05). FEASTING's pig gives 10 to 12 kg of lard (FEASTING after the FALL, ch. 9), so one pig's lard is roughly one household's soap for a year, and it competes with the kitchen. Lye burns children in soap-making homes. Lye is stored locked and high.

The sickroom fifth. NU-03's room has a window that stays open, one bed, a washing line, one named carer and a covered bucket, with a separate plate, cup and spoon and a slate for the chart (THRIVING library, NU-03). The village needs a detached hut for households with no second room. The measured benefit sits in the first 36 hours of an outbreak, so the stores must exist before the first case.

The register sixth, though it starts on day 1 as a notebook. OR-05's five registers take about an hour a week and 300 pages a year: the daybook with a weekly tally, births and deaths, the watch list, labour sheets, and the ledger with the poisons book (THRIVING library, OR-05). The alert list is painted on the wall.

Chlorine solutions follow the household strengths of HY-05: 0.05% for hands and skin, 0.2% for surfaces, 0.5% for spills and the dead (THRIVING library, HY-05). Handrub can be made later in the year from the still's spirit.

1.5 The first season: the garden by climate

OR-02 plans about 700 m^2 of medicinal garden for a village of 300, about 2 to 2.5 m^2 a person [VERIFY], kept by one person for about a day a week, 300 to 350 hours a year. The temperate plan is chamomile 200 m^2, thyme 85, sage 50, peppermint 28, lemon balm 15, fennel 20, calendula 60, marshmallow 20, a nursery of 30 and a fenced plot of 20 (THRIVING library, OR-02). Plans also exist for Mediterranean, dry, wet tropical and boreal zones. The household version is ten plants by zone. For a temperate household they are chamomile, thyme, peppermint, sage, lemon balm, calendula, garlic, fennel, plantain and rose.

PH-01 proposes a much smaller garden, about 70 m^2, after the Vietnamese commune stations. OR-02 answers that those 70 m^2 stations were display gardens backed by a national supply, not a village's whole pharmacy (THRIVING library, OR-02, PH-01, SY-06). This report follows OR-02 for the village and treats 70 m^2 as a sensible household or teaching bed.

The garden depends on seed. Peppermint sets no true seed and must come as a root or cutting. Perennials such as sage, thyme and marshmallow give little in the first year. OR-02 asks for two seasons of seed kept in two places, and a germination test of 20 seeds on a wet cloth before sowing (THRIVING library, OR-02). The first season's failures are predictable: the wrong mint, chamomile sown too deep (it needs light to germinate), and calendula left unpicked so it stops flowering.

The locked bed holds foxglove [OWNER] and opium poppy [OWNER]. This report gives no method for either. The library disagrees on whether foxglove belongs in a village garden at all (THRIVING library, SY-06).

OR-02 also says the garden is a school and a comfort, not a pharmacy [OWNER]. The rule matters for sequence. A garden planted in season 1 teaches plant names and gives teas by season 2. It will not replace a single drug on the salvage list in year 1.

The garden competes with food. FEASTING plans a kitchen garden of about 300 m² for a household of four, about 240 hours a year, for about 1,250 kg of vegetables (FEASTING after the FALL, ch. 6). The medicinal garden for a whole village takes more hours a year than one household's kitchen garden. That is a real cost, and the village must decide who pays it [OWNER].

1.6 The first year: still, pressure cooker, soap, tinctures and dressings

The pressure cooker. WO-12 makes one named keeper of the steriliser responsible for cleaning, packing, running the cooker, drying the packs, writing the log and guarding the store (THRIVING library, WO-12). Methods failed when people stopped doing them properly, not when the heat failed (Dicko 2000, via THRIVING library, WO-12). The standard is 121°C, about 1.1 bar above atmosphere, for 30 minutes for wrapped loads (THRIVING library, FO-11). When the cooker fails, instruments are boiled for 20 minutes and the case is logged as disinfected, not sterile. A salvaged domestic pressure cooker is the single most useful piece of surgical equipment a village can hold [VERIFY].

The still. ME-03 sizes one village still at about 70 L of 40% spirit a year from sugar or grain, with about a third redistilled to 70% for antisepsis (THRIVING library, ME-03). It needs a copper vessel with no lead solder and no galvanised part, a proper condenser, cooling water, fuel, a beam balance, a register and a two-person key. The district adds a column for 95% spirit. The first failure at district level is diversion of the strong spirit to drink or trade. The still is a year-one job because it needs salvaged copper and a settled grain or sugar surplus, which a village rarely has before its first harvest. Handrub follows the still (WHO formulation I, as in FO-11): 833.3 mL of 96% ethanol, 41.7 mL of 3% hydrogen peroxide, 14.5 mL of 98% glycerol, water to 1 L, left 72 hours, no batch larger than 50 L. Below 80% final ethanol the formula fails [VERIFY].

Soap at scale. The dispensary's 45 kg of fat a year (THRIVING library, HY-05) needs either a pig herd or tallow from the slaughter, and the fat budget has to be agreed with the kitchen in autumn when animals are killed.

Tinctures and dressings. Tinctures need the 40 to 70% spirit and the garden's second-season herbs, so they are a late year-one or year-two job. Dressings need cotton or linen cloth boiled or cooked in the pressure cooker, dried and wrapped, and honey as the fallback wound cover (THRIVING library, OR-06, FO-11). The village rolls bandages in winter, when hands are free.

1.7 Whom to train and in what order

The library agrees on the order of the first two trainees and disagrees on the number. OR-01's curriculum trains two lay healers chosen by the assembly, adults past the age of marriage and migration [OWNER], in 300 hours: four blocks of 72 hours (clean hand and danger signs, killers of children, birth and wounds, adults and epidemics and the village) plus 12 hours of certification, at 8 hours a day for 6 days a week, with 4 to 8 weeks of village practice between blocks, over 5 to 8 months (THRIVING library, OR-01). There are no injections, microscope or surgery in those 300 hours. FO-11 sizes one healer per village. OR-01, MI-12 and SY-05 all prefer two, because attrition runs between 3% and 77% and one healer falling sick leaves nothing (THRIVING library, FO-11, OR-01, SY-05). This report follows the two.

The sequence that falls out of the library is:

1. **The healer pair, blocks 1 and 2, in the first season.** SY-05 ranks the breath count with amoxicillin first and oral rehydration second in lives saved per training hour, then malaria where it exists, measles with vitamin A, and breastfeeding (THRIVING library, SY-05). Blocks 1 and 2 teach exactly these. In a village of 300 with 7

to 9 deaths a year in the tropics or 5 to 7 in temperate places, the package averts about a third of deaths in the tropics and a fifth in temperate places.

2. **The birth attendant, before the first birth.** A village of 300 has about 6 births a year in a temperate place and 10 in a tropical one (THRIVING library, SY-05, TR-14). The first will come within two months. Helping Babies Breathe is a 1-day course, and the Haydom drill of 3 minutes a week and 40 minutes a month cut 24-hour newborn deaths from 11.1 to 7.2 per 1,000 (via THRIVING library, OR-01). The attendant trains with block 3 if possible and with the 1-day course if the birth comes first. TR-14 adds a monthly women's group with every pregnant woman and her mother-in-law (THRIVING library, TR-14).
3. **Every adult, the clock card and the household visit.** A two-hour household visit once a year, with a check one month later (THRIVING library, SY-05).
4. **The bonesetter, a one-day course.** One day of training for traditional bonesetters cut gangrene amputations from 25 to 7 in the study OR-01 cites (via THRIVING library, OR-01). It is the cheapest gain on the list.
5. **The steriliser keeper and the still keeper,** in the first year, each by apprenticeship (THRIVING library, WO-12, ME-03).
6. **The district nurse and advanced midwife,** in year 2, for a district of 3,000 (THRIVING library, TR-14, OR-07).
7. **The microscopist last.** No microscope in the village [OWNER] (THRIVING library, OR-04).

Hand skills decay within 3 months without practice (THRIVING library, OR-01), so every trained skill needs a drill on the calendar from the day it is taught.

SY-05 counts about 850 training hours in year 1 across the village (THRIVING library, SY-05). That is the single largest labour item in this report after the latrines.

1.8 What records to start

OR-05's five registers start on day 1 (THRIVING library, OR-05). The births and deaths register is the one that tells the village whether anything is working. The watch list names the pregnant, the newborn, the malnourished child and the chronic patient whose drug is running out. The poisons book and ledger hold the inner cupboard count. The rule of two means no controlled drug moves without two signatures.

The household keeps a single page: who is on which drug and how many days remain, who has had measles, chickenpox and whooping cough (THRIVING library, IN-12), and who has had tetanus toxoid. The first failure OR-05 predicts is that the healer stops writing in month 3. The answer is the weekly tally read aloud at the assembly.

1.9 What to stockpile for the winter and the epidemic

OR-06 uses the WHO Interagency Emergency Health Kit as the yardstick. The 2017 kit serves 10,000 people for 3 months. Its basic module serves 1,000 people for 3 months and weighs about 38 kg in about 0.22 m^3 (via THRIVING library, OR-06). A factor of 1.2 scales one basic module to 300 people for a year, and the supplementary module scales at 0.12. A year for 300 comes to about 140 kg in under 1 m^3 [VERIFY]. FO-11 puts the village shelf under 60 kg a year (THRIVING library, FO-11). The two figures differ because OR-06 counts packaging and supplies and FO-11 counts drugs. This is my reading of the gap [VERIFY].

The kit overstocks antibiotics and understocks obstetric drugs. Its 3,600 amoxicillin tablets are 120 to 180 courses, against IN-05's estimate of 40 to 80 courses a year for 300 people. Misoprostol should rise to about 40 doses (THRIVING library, OR-06, IN-05). OR-06 sets floors after a ship's medicine list: adrenaline 10, ceftriaxone 10, tranexamic acid 5, naloxone 4, magnesium sulfate 10 [OWNER]. Gloves run 2,000 to 5,000 a year [VERIFY].

Stock lives in three tiers: a first-year shelf used first expiry first out, a sealed reserve drawn quarterly, and a forever list the village can make or find (soap, oral rehydration salts, boiled cloth, ethanol, honey, vinegar, salt, charcoal and plants). The open shelf never holds more than 3 months (THRIVING library, OR-06). The decade quantities in

ME-09 are larger, for example 36,000 amoxicillin tablets, 400 misoprostol, 15,000 phenobarbital, 16 magnesium and 90 oxytocin for 300 people (THRIVING library, ME-09).

For winter the village adds fuel for boiling and the sickroom, the dispensary's soap fat, rolled bandages and the salt the kitchen also needs (FEASTING after the FALL, ch. 11). For the epidemic, NU-03 wants cloth, soap, buckets and chlorine of known strength held before the first case, a rota of at least six carers and the detached hut (THRIVING library, NU-03). IN-12 expects a measles epidemic within about two years of vaccines stopping (THRIVING library, IN-12). The last tetanus toxoid goes to pregnant women first (THRIVING library, HY-10).

Cold storage is weak. A clay pot cooler lowers the temperature by about 6.7°C in dry air but only 1.8°C above 70% humidity, keeps its inside air at 80 to 100% humidity, so only sealed vials may go in, and only about half of users kept watering it (via THRIVING library, OR-06). A cellar holds roughly the local mean annual temperature, and about 2 m of depth cuts the seasonal swing to a third. FEASTING's cellar runs at 10 to 13°C (FEASTING after the FALL, ch. 12). Malawi lost 35% of its medicines to leaking roofs and poor storage (via THRIVING library, OR-06).

The keys are where the library splits. OR-06 gives the cabinet key to the keeper, the inner controlled-drug key to a second named person, and a sealed spare to the council. OR-08 gives the two inner keys to two households not related to each other or to the healer, rotating yearly with nobody holding a key more than 2 years in 5, a weekly count, and an emergency opening after 15 minutes with the council chair (THRIVING library, OR-06, OR-08). Counts run monthly by a second person and yearly by an outsider in both. The village chooses [OWNER].

1.10 Honest loss: what the village does without

Both ME-09 and FO-11 refer "honest loss" to SY-09 (THRIVING library, ME-09, FO-11). The brief for this report does not name it, so it is covered briefly here and flagged as an open question. FO-11's do-without bin lists insulin beyond the vials in hand, oxytocin without refrigeration, vaccines, antiretroviral and TB drugs beyond stock, chemotherapy and most cardiovascular drugs (THRIVING library, FO-11). OR-03 adds the order of running out: chronic drugs first, then disposables, then chlorine and anaesthesia (THRIVING library, OR-03).

The honest plan for each is a conversation in week 1 with the patient and family, a count of days remaining, a taper where one is safe, and comfort when the drug ends. FO-01 says a lay healer can prevent perhaps 1 to 2 of the 6 to 8 deaths a village of 300 would see in the first year (THRIVING library, FO-01). The rest are losses the sequence cannot prevent, and the book should say so plainly [OWNER].

1.11 The oxytocin disagreement

The library holds three positions on oxytocin, and the sequence depends on which is right.

- FO-11: do without oxytocin once refrigeration fails. Rely on misoprostol (THRIVING library, FO-11).
- ME-09: a cellar at 12 to 15°C keeps oxytocin usable for 2 to 4 years [VERIFY] (THRIVING library, ME-09).
- OR-06: a cellar only holds the local mean annual temperature, so in the tropics it is no better than a cupboard. At 25°C oxytocin lasts 2 to 3 years and at 30°C about 1 [VERIFY]. OR-06 attributes the cellar claim to FO-11 when it is in fact ME-09's (THRIVING library, OR-06).

The three agree on the practical rule. Misoprostol is the uterotonic the village can keep, stored in intact blisters. Oxytocin is used first and before misoprostol, and in temperate cellars kept for as long as it lasts. Misoprostol 600 µg by mouth cut postpartum haemorrhage from 12.0% to 6.4% in a community trial, about one haemorrhage prevented per 18 women (Derman 2006, via THRIVING library, FO-11).

1.12 Quantities and labour for 6 and for 300

The table gathers the library's quantities. Hours are first-year hours. Where a figure is my own scaling it is marked.

Item	Household of 6	Village of 300	Labour, year 1	Source
Latrine pit filling	0.36 m³ a year	18 m³ a year	2 to 4 person-days a pit [VERIFY]	HY-04
Soap use	about 9.6 kg a year for hands at 4.4 g a day, 15 to 22 kg with laundry [VERIFY]	about 480 kg a year for hands [VERIFY]	a day a batch	HY-01, HY-05
Fat for soap	15 to 22 kg [VERIFY]	dispensary 45 kg plus households	autumn slaughter	HY-05
Boiling water	about 0.3 kg wood a litre	by household	daily	HY-02
Medicinal garden	10 plants, a bed of up to 70 m²	about 700 m²	300 to 350 hours	OR-02
Kitchen garden (for comparison)	about 450 m² [VERIFY: scaled from 300 m² for 4]	by household	240 hours for 4	FEASTING ch. 6
Medicine shelf	10 items, one box	about 140 kg, under 1 m³	1 hour a week counting	OR-06
Registers	one page	5 registers, 300 pages	1 hour a week	OR-05
Training	one 2-hour visit	about 850 hours	healer pair 600 hours	SY-05, OR-01
Still	none	about 70 L of 40% spirit	about 6 to 10 days of runs [VERIFY]	ME-03
Births a year	under 1	6 temperate, 10 tropical	attendant on call	SY-05, TR-14
Deaths a year	under 1	5 to 7 temperate, 7 to 9 tropical		SY-05
Consultations	1 to 4 a person	1 to 4 a day	healer half-time	FO-11

1.13 Order of operations with dependencies

The dependencies are what make this a sequence rather than a list.

- Water survey precedes chlorination, which needs bleach or salvaged chlorine.
- Latrine siting needs the water survey, so the pit is downhill of the well.
- The handwashing station needs the latrine and soap.
- Soap needs fat and lye. Fat needs the autumn slaughter, so the first winter runs on salvaged soap and ash.
- The sickroom needs cloth, soap, chlorine and a carer rota.
- Training block 1 needs no stock. Block 2 needs amoxicillin and oral rehydration salts to practise with. Block 3 needs the birth kit.
- The garden needs seed and a fence. Tinctures need the garden's second season and the still's spirit.
- The still needs copper, fuel and a grain or sugar surplus, so it waits for the first harvest.
- Handrub needs the still at 96% or bought ethanol, hydrogen peroxide and glycerol. Glycerol is a by-product of soap making [VERIFY].
- Sterile dressings need the pressure cooker and its keeper.

The critical path in year 1 runs water, latrine, handwashing, healer block 1, healer block 2, birth attendant drill, sickroom stores before winter. Everything else can slip by a season without costing lives.

1.14 Not assuming FEASTING has succeeded

The brief warns that the sequence must not assume FEASTING's household has already succeeded. FEASTING has no explicit first-year health sequence. Its kitchen garden, cellar, pig and soap chapters are steady-state plans (FEASTING after the FALL, ch. 6, 9, 12, 17). This report therefore assumes no lard until the first slaughter, no cellar until one is dug, no grain surplus until the first harvest, and salt only from what is already above ground (FEASTING after the FALL, ch. 11). If FEASTING's household is working, the still and the soap move earlier. If not, the first year runs on salvage, ash and boiling.

1.15 What the second year adds

The second year adds the healer pair's blocks 3 and 4 if they slipped, the district nurse and advanced midwife for a district of 3,000, the infirmary of OR-07 (ten beds, mostly surge capacity, water of 250 to 1,000 L a day, wood of 13 to 22 t a year, a core staff of 11 to 13 and a walking donor panel of 30 to 50), the still's second run with tinctures from the garden's perennials, the biosand filter if it was not built, the first measles epidemic, and the first audit of the stock by an outsider (THRIVING library, OR-07, IN-12, OR-06). The second year is also when the training begins to decay, so refresher drills replace new courses.

2. Evidence grades

Claim	Grade	Basis
Soap and handwashing cut child diarrhoea about 30%	A	trials and meta-analyses via HY-01
Community case management of pneumonia saves lives	A	trials via SY-05, IN-05
Misoprostol 600 μg halves postpartum haemorrhage in community use	A	Derman 2006 trial via FO-11
Solid tablets keep well past label (SLEP)	B	large programme, not open data, via ME-09
Latrine benefit needs 50 to 75% coverage	B	observational via HY-04
Neonatal drill cuts 24-hour deaths (Haydom)	B	before-and-after study via OR-01
Bonesetter one-day course cuts gangrene	C	single before-and-after study via OR-01
Oxytocin keeps 2 to 4 years in a cellar	D	inference from stability data, disputed by OR-06
700 m^2 garden for 300	C	planning estimate, disputed by PH-01
IEHK scaled to 300 for a year at about 140 kg	C	arithmetic on WHO kit data
850 training hours in year 1	C	planning estimate from SY-05
Salvage window of 7 days	D	no measured evidence
Seed as a top salvage item	D	my inference
A domestic pressure cooker sterilises wrapped loads at 121°C	B	engineering standard via FO-11, WO-12

Clay pot cooler suits tablets	X	contradicted by humidity data via OR-06

3. Means ledger

SY-08, the library's means ledger, is forthcoming. This table only shows what each rung needs from this sequence.

Rung	What this sequence gives it	Year
Hands	handwashing, clock card, danger signs, the birth stop list, the household page	month 1
Hearth	boiled water, soap, boiled cloth, oral rehydration salts, the sickroom	month 1 to 3
Garden and still	ten household plants, the 700 m² garden, the still, handrub, tinctures	season 1 to year 2
Village dispensary	the healer pair, the birth attendant, the five registers, the locked shelf, the pressure cooker	year 1
District infirmary	ten beds, nurse and advanced midwife, sterile packs, donor panel	year 2
Hospital reference	salvage only, and nothing this sequence can build	none

4. Harm test

Each step in the sequence can hurt someone. The test asks what harm it can do, to whom, and what stops it.

- **Salvage.** Taking drugs from a hospital or pharmacy that others still need can kill them. Households give only by agreement [OWNER]. Veterinary concentrations can poison a person at ten to forty times the intended dose. Every veterinary item is relabelled in red with its strength. Expired drugs that look fine may have lost strength, and misoprostol from a damaged blister may have lost half (THRIVING library, ME-09).
- **Lye and soap.** Sodium and potassium hydroxide cause deep burns and blindness, and children in soap-making homes are burned (THRIVING library, HY-05). Lye is stored locked and high, made away from children, with goggles and a bucket of water at hand.
- **Chlorine.** The wrong strength fails to disinfect or burns skin. Stock is made to a written recipe and labelled with its date and strength (THRIVING library, HY-05).
- **The still.** Lead solder poisons, a sealed still explodes, and spirit is diverted to drink (THRIVING library, ME-03). Copper only, never seal it, two-person key, register.
- **The pressure cooker.** A blocked valve or a forced lid scalds and blinds. Only the keeper runs it (THRIVING library, WO-12).
- **The household shelf.** Iron tablets and adult drugs kill toddlers. No antibiotics, iron or controlled drugs at home [OWNER] (THRIVING library, OR-06).
- **The lay healer.** Over-confidence, injections without training, and delay in sending on. SY-10 names delay as the deadliest error, then measuring wrongly (THRIVING library, SY-10). The 300 hours exclude injections and surgery.
- **Sedative withdrawal.** Stopping benzodiazepines or alcohol suddenly causes seizures and death. Taper (THRIVING library, MI-06).
- **The garden.** Foxglove in an open bed kills a child who eats it [OWNER]. The locked bed exists for this reason.

No step in the sequence fails the harm test outright, provided the safeguards hold. The still and the salvage run carry the highest risk of harm per hour of work.

5. Red flags

Stop and send on, or stop and rethink, when any of these appear.

- A salvage team is gone longer than planned, or meets armed resistance. No drug is worth a death on the road.
- A veterinary vial or paste has no clear strength on the label. Quarantine it.
- A drug has changed colour, smell or texture, a blister is torn, or a vial froze. Quarantine it.
- The register has not been written for two weeks. The first failure OR-05 predicts has arrived.
- Two or more children with diarrhoea in a week from the same water source. Resurvey and chlorinate.
- A rash with fever and red eyes. Measles is here (THRIVING library, IN-12).
- Deaths above 1 per 10,000 a day, which is about 1 death in a month in a village of 300, is the emergency threshold (THRIVING library, FO-11).
- Amoxicillin stock under 12 months. Report it. Under 6 months, use only for children with danger signs and adults over 60 [OWNER] (THRIVING library, SY-05).
- The inner cupboard count does not match the poisons book.
- The healer is sick, absent or leaving, and no second healer is trained.

6. The case against, with named critics

The case against a planned bootstrap sequence has five strands.

Selective care and the narrowing of health. Julia Walsh and Kenneth Warren argued in 1979 for a short list of cheap interventions that save the most lives. Kenneth Newell called that approach a counter-revolution against the Alma-Ata idea of community-owned primary care, because it turns health into a list of technical fixes delivered from outside [VERIFY: not read in full here]. SY-05's ranking by lives per training hour is selective in exactly Walsh and Warren's sense. A village that only trains to the ranked list may lose the reasons people trusted the healer in the first place.

The lackey or the liberator. David Werner warned in 1977 that village health workers can be made into lackeys of a system rather than leaders of their own community [VERIFY: not read in full here]. A sequence that hands the healer a locked cupboard, five registers and a key holder rota may produce exactly that. OR-01's choice by assembly is the library's answer, and it is untested after a collapse.

Water and sanitation may not deliver. The WASH Benefits trials in Bangladesh and Kenya and the SHINE trial in Zimbabwe, published in 2018 and 2019, found no effect on child growth and mixed effects on diarrhoea from improved water, sanitation and handwashing at household level [VERIFY: not read in full here]. HY-04's coverage threshold of 50 to 75% may explain this. Household latrines below that threshold may not help at all, and the first month's work may not show any gain for a year.

Herbal gardens as false comfort. Edzard Ernst has spent a career showing that most herbal medicines lack evidence of benefit and some cause harm [VERIFY: not read in full here]. OR-02's own ruling that the garden is not a pharmacy [OWNER] concedes most of this. The risk is that a village plants 700 m^2 and believes it has replaced the shelf.

Salvage as looting. Taking a hospital's stock in the first days may leave a functioning hospital without drugs, and the people who would have used them may be the village's own sick. The library has no named critic for this, but the ethics of salvage are an owner decision, not a technical one [OWNER].

The answer to the case against is not to drop the sequence but to keep its claims modest. The library's own estimate is that the whole package averts a fifth to a third of deaths (THRIVING library, SY-05). The rest are honest losses.

7. 10-line summary

1. The salvage window may not exist, so the first month must work with no salvaged drug at all.
2. If it is open, salvage by what spoils first: fridges, hospital, pharmacy, dentist, vet, then surgeries and households by agreement (ME-09).
3. Curing drugs outrank time-buying drugs, and insulin falls below the line.
4. Month 1 builds water, latrine, handwashing, soap, sickroom and the register, in that order of dependency.
5. Season 1 plants the garden from seed kept in two places, about 700 m^2 for 300, as a school, not a pharmacy (OR-02).
6. Year 1 adds the pressure cooker and its keeper, the still after the first harvest, soap at scale, dressings and handrub.
7. Train the healer pair first, the birth attendant before the first birth, every adult by visit, the bonesetter in a day, the microscopist last.
8. Start five registers on day 1, keep the stock in three tiers, and never hold more than 3 months on the open shelf.
9. The library disagrees on oxytocin, garden size, key holders and the number of healers, and the village must choose.
10. Year 2 adds the district nurse and midwife, the infirmary, tinctures, the first epidemic and the first outside audit.

8. Open questions

- How long is the salvage window after a real collapse, and does any historical case measure it [VERIFY]?
- Which report owns "honest loss"? ME-09 and FO-11 both refer it to SY-09, and the brief for SY-09 does not name it. The do-without list here is brief. The owner should decide whether it needs its own report [OWNER].
- OR-06 attributes the cellar claim for oxytocin to FO-11. It is ME-09's. Which report should be corrected?
- Does oxytocin keep for 2 to 4 years in a temperate cellar? No stability study at 12 to 15°C was found in the library.
- Is the village garden 700 m^2 or 70 m^2, and who pays its 300 to 350 hours [OWNER]?
- Who holds the inner key, the healer's colleague (OR-06) or two unrelated households (OR-08) [OWNER]?
- One healer or two? The library leans to two, FO-11 sizes one.
- How many births does a village of 300 see? SY-05 and TR-14 give 6 to 10 a year, and FO-01 and IN-01 differ.
- How much fat can a village spare for soap without hurting the kitchen?
- Should seed, copper and a pressure cooker be added to ME-09's ranked list?

9. Sources to read in full

1. ME-09, the salvage list and its ranking, for the decade quantities and the route.
2. OR-06, the stockpile, for the IEHK scaling and the three tiers.
3. FO-11, humanitarian kits, for the four bins and the make list.
4. OR-01, the 300-hour curriculum, for the training blocks.
5. SY-05, lives per training hour, for the ranking and the healer's first year.
6. OR-05, the registers.
7. OR-02, the garden by climate.
8. HY-01, HY-02, HY-04 and HY-05, for the first month.
9. WHO Interagency Emergency Health Kit 2017, the kit list itself (not read in full for this report).
10. Lyon et al. 2006 on the Shelf Life Extension Program (via ME-09, not read in full here).
11. Walsh and Warren 1979, Newell 1988 and Werner 1977 for the case against (not read here).
12. FEASTING after the FALL, chapters 6, 9, 11, 12, 17 and 18.

10. At the bedside after the Fall

The household of six. *To start:* the ten-item shelf in a locked box (OR-06), a pot big enough to boil cloth, a covered bucket, a basin, soap or ash, a handwashing station by the latrine and the cooking place, one page listing who takes which drug and how many days remain, and who has had measles, whooping cough and toxoid. *Skills:* the five times for handwashing, oral rehydration by the measured spoon, the danger signs in a child, boiling water, the sickroom of NU-03, and the birth stop list of TR-14. *First month:* dig or share a latrine, survey the well, count the sedatives and plan a taper. *First season:* ten plants in a bed by the door. *First failure to expect:* the soap runs out in the first winter because the fat went to the kitchen, and handwashing stops with it. The fallback is ash, agreed before it happens.

The village of 300. *To start:* two people chosen by the assembly for the 300 hours [OWNER], a birth attendant drilled before the first birth, a room for the dispensary with a locked shelf and an inner cupboard, the five registers, a water survey, a latrine plan reaching 75% of households, a sickroom store of cloth, soap, buckets and chlorine, a pressure cooker and its keeper, and seed for the 700 m² garden kept in two places. If salvage worked, the first-year shelf and sealed reserve of OR-06, about 140 kg. *First failure to expect:* the healer stops writing in the register in month 3 (OR-05), so the village loses its only measure of whether anything is working. The second is that the one person who knows a skill falls sick on the day it is needed, which is why everything is trained twice.

The district of 3,000. *To start:* the infirmary of OR-07 with ten beds, water of 250 to 1,000 L a day and wood of 13 to 22 t a year, a nurse and an advanced midwife, the still with a column for 95% spirit, sterile packs, a donor panel of 30 to 50, a cart and messengers that reach every village within hours, and the outside auditor who counts each village's stock once a year. *First failure to expect:* villages send too late, from pride or because the road is hard, and the infirmary receives patients it can no longer save (THRIVING library, TR-14, SY-10). The second is diversion of strong spirit (THRIVING library, ME-03).

11. Protocols

Protocol 1. The first week (salvage, only if the window is open)

- ☐ Day 0. Name a salvage team of 4 to 6 and a village team that starts the water survey the same day. Set a return time. A team overdue by half a day is not followed.
- ☐ Day 0 to 1. Fridges first: insulin, oxytocin, ergometrine, toxoid, vaccines, antivenom. Carry in a cool box, never on ice that can freeze them. Log the hours above 25°C.
- ☐ Day 1 to 2. Hospital pharmacy and theatres, by ME-09's ranked list, top ten first.
- ☐ Day 2 to 3. Pharmacies and wholesalers.
- ☐ Day 3 to 4. Dental surgeries (lidocaine, needles, instruments).
- ☐ Day 4 to 5. Veterinary practices and farms. Mark every item VETERINARY in red with its strength per mL or per gram.
- ☐ Day 4 to 6. Seed merchant or farm store: two seasons of seed for the garden [VERIFY]. Hardware: copper pipe, a pressure cooker, lye, bleach, glycerol, thermometers, a hanging scale, paper.
- ☐ Day 5 to 6. GP surgeries, care homes, households only by agreement [OWNER].
- ☐ Day 7. Inspect every item. Quarantine torn blisters, frozen vials, discoloured or wet stock. Log each item, lot, strength and expiry. Nothing is used unlogged.
- ☐ Day 7. Store at 0 to 30°C, below 25°C if possible, humidity 65% or less, shelves 60 cm from walls, first expiry first out.

Protocol 2. The first month

- ☐ Week 1. Sanitary survey of every water source. Chlorinate at 4 mL of 1% stock per 20 L, wait 30 minutes, or boil (about 0.3 kg wood a litre).
- ☐ Week 1. Count sedatives and alcohol dependence in every household. Taper, never stop at once.

- ☐ Week 1. Open the five registers. Paint the alert list on the wall.
- ☐ Week 1 to 2. Site latrines at least 30 m from water, downhill, 1.5 m above the water table. Size at 60 L a person a year. Aim for 75% of households.
- ☐ Week 2. Handwashing stations at every latrine and cooking place. Soap first, ash second.
- ☐ Week 2 to 3. Sickroom stores: cloth, soap, buckets, chlorine at 0.05%, 0.2% and 0.5%, a detached hut, a rota of at least six.
- ☐ Week 3 to 4. Healer pair begins block 1 (72 hours).
- ☐ Week 4. Start a biosand filter if sand and a barrel exist (30 days to ripen).
- ☐ Every week. Read the tally aloud at the assembly.

Protocol 3. The first season

- ☐ Test 20 seeds of each kind on a wet cloth. Under half sprouting means sow double or find more seed.
- ☐ Fence the garden plot. Sow chamomile on the surface, never buried. Peppermint from roots or cuttings only.
- ☐ Pick calendula every few days so it keeps flowering.
- ☐ Locked bed only for foxglove [OWNER] and opium poppy [OWNER]. No method here.
- ☐ Keep the next season's seed in two places.
- ☐ Healer block 2 (72 hours). Birth attendant 1-day course and weekly 3-minute drill.
- ☐ Bonesetter 1-day course.

Protocol 4. The first year

- ☐ Name the steriliser keeper. Pressure cooker at 121°C (about 1.1 bar) for 30 minutes for wrapped packs. Log date, load, indicator. If it fails, boil 20 minutes and log as disinfected.
- ☐ After the first harvest, build the still in copper with no lead solder. Never seal it. Two-person key and a register.
- ☐ Handrub only with ethanol of known strength: 833.3 mL of 96% ethanol, 41.7 mL of 3% hydrogen peroxide, 14.5 mL of glycerol, water to 1 L, 72 hours, batches no larger than 50 L.
- ☐ Autumn slaughter: agree the fat for soap with the kitchen. Dispensary soap needs about 45 kg of fat a year.
- ☐ Winter: roll bandages, boil and wrap dressings, count stock, draw the quarterly reserve.
- ☐ Monthly count by a second person. Yearly count by an outsider.
- ☐ Amoxicillin under 12 months of stock, report. Under 6 months, children with danger signs and adults over 60 only [OWNER].
- ☐ Healer blocks 3 and 4 and certification (12 hours).

Protocol 5. The second year

- ☐ District nurse and advanced midwife in training.
- ☐ Ten-bed infirmary for the district, donor panel of 30 to 50.
- ☐ Tinctures from the garden's perennials and the still's spirit.
- ☐ Measles plan: isolation hut, vitamin A, a rota, the register of who has had it.
- ☐ Refresher drills replace new courses: 3 minutes a week and 40 minutes a month for birth skills.
- ☐ First outside audit of the stock and the registers.

12. Numbers to carry

1. 7 days for the salvage route, fridges first, and nothing used unlogged.
2. 30 m from water, downhill, 1.5 m above the water table, for every latrine.
3. 4 mL of 1% chlorine stock per 20 L of water.
4. 130 g of sodium hydroxide per kg of fat for soap.
5. 300 hours to train a healer, in four 72-hour blocks plus 12 of certification.

6. 3 months: the most stock on the open shelf, and the time it takes a hand skill to decay.
7. 121°C for 30 minutes in the pressure cooker.
8. 6 to 10 births and 5 to 9 deaths a year in a village of 300.
9. About 140 kg and under 1 m^3 for a year's medicine for 300.
10. A fifth to a third of deaths averted by the whole package, and no more.

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