IN-01 The great killers after the Fall: diarrhoea, pneumonia, malaria, measles, TB and sepsis, a ranked map by climate and age

HEALING after the FALL, research library, IN-01

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Findings by section

1. Scope, method and the three voices

This report ranks the infections most likely to kill in a village of 300 and a district of 3,000 after the Fall, with the fraction a cheap action prevents. Three bodies of evidence are kept apart. The modern tables (GBD 2019 Diseases and Injuries Collaborators 2020, Black et al 2010, Liu et al 2016, UNICEF 2026) are partly counted and partly modelled, and in the poorest countries rest on verbal autopsy and statistical models (Byass et al 2013). The historical registers (the Registrar General for England and Wales from 1837, Massachusetts, the Swedish Tabellverket from 1749, the London Bills of Mortality) count real deaths but name them in the medicine of their day: "convulsions", "atrophy", "teething", "consumption". The intervention models (Jones et al 2003 and the 2010 Lives Saved Tool papers) say what could be prevented at full coverage, not what has been. Village memory is a fourth voice and the least reliable. It remembers the epidemic and the death in childbirth and forgets the infant who wasted over a fortnight of diarrhoea.

The brief states that this report feeds the ranking in SY-05 and the lay healer's curriculum in OR-01. It should be read alongside FO-01, FO-02, HY-03, MA-07 and IN-12, whose texts I have not seen, so I do not cite their contents.

2. What the modern tables show

2.1 Children under five Jones et al (2003) started from 9.66 million under-5 deaths in 2000 in the 42 countries holding 90% of child deaths. Their Table 3 assigns 22% to diarrhoea, 21% to pneumonia, 9% to malaria, 3% to HIV/AIDS, 1% to measles and 33% to neonatal disorders (birth asphyxia 10%, neonatal sepsis 8%, preterm delivery 8%, neonatal tetanus 2%). Black et al (2010) estimated 8.795 million under-5 deaths in 2008, 68% from infection, with pneumonia 18%, diarrhoea 15% and malaria 8% (secondary summaries only). Liu et al (2016) estimated 5.941 million in 2015, 45.1% of them neonatal: pneumonia 0.921 million (15.5%), diarrhoea 0.526 million (8.9%, my arithmetic), malaria 0.306 million, measles 0.074 million, neonatal sepsis 0.401 million (6.8%), preterm complications 1.055 million (17.8%) and intrapartum events 0.691 million (11.6%). Pneumonia led in sub-Saharan Africa (16.6%) and preterm complications in southern Asia (25.3%), where 57% of child deaths were neonatal.

The UN IGME release of 18 March 2026 gives 4.9 million under-5 deaths in 2024, 2.3 million of them newborns. Preterm complications caused 36% and labour complications 21% of newborn deaths, malaria caused 17% of deaths at 1 to 59 months, and sub-Saharan Africa held 58% of all under-5 deaths. The pace of decline has slowed by more than 60% since 2015 (UNICEF 2026).

GBD 2019 ranks, for ages 0 to 9 by lost healthy life, neonatal disorders first (32.4%), then lower respiratory infections, diarrhoea, congenital defects and malaria, with sub-Saharan Africa carrying 49.9% of the burden (GBD 2019 Diseases

and Injuries Collaborators 2020). In North Africa and the Middle East, the arid band, the leading causes of child death were neonatal disorders, congenital defects and lower respiratory infections, with diarrhoea outside the top three (GBD 2019 North Africa and Middle East collaborators 2023).

Undernutrition sits beneath all of this. Black et al (2013) attributed 3.1 million child deaths in 2011, 45% of the total, to fetal growth restriction, stunting, wasting, micronutrient deficiency and suboptimal breastfeeding. This overlaps the infection figures and must never be added to them.

Measles is about 1% of child deaths in these tables only because most children are vaccinated. The neonatal share rose from 33% in 2000 (Jones et al 2003) to 45.1% in 2015 (Liu et al 2016) because the infections of older children were being prevented faster. A post-Fall village loses vaccination first, so its profile will drift back towards the older-child infectious mix of the 1870 table.

2.2 Adults and the old In GBD 2019, HIV/AIDS ranked second and tuberculosis in the top ten causes of lost healthy life at ages 25 to 49, and lower respiratory infections were in the top ten over 75. Maternal disorders are the leading infectious-age killer of women in poor countries. I extracted ranks only, not adult death counts by cause for low-income countries [VERIFY].

3. What the pre-1900 tables show

3.1 England and Wales, 1871 to 1880 The Registrar General's decennial supplement for 1871 to 1880, transcribed by Robert Woods (Woods 2000) and published on A Vision of Britain through Time, gives deaths by cause and age (Registrar General 1871-80). I summed it. Of 5,178,311 deaths, 2,080,358 (40.2%) were under five.

Cause (Registrar General wording)	Deaths 1871-80	Share of all deaths	Share under 5	Share 15-44	Share 65+
Diseases of respiratory system	915,340	17.7%	19.3%	9.4%	21.8%
Diseases of nervous system (includes infant "convulsions")	674,279	13.0%	14.4%	7.5%	15.4%
Phthisis (pulmonary TB)	515,099	9.9%	1.2%	36.8%	1.3%
Diarrhoea and dysentery	221,552	4.3%	8.9%	0.6%	1.9%
Scarlet fever	174,232	3.4%	5.5%	0.6%	0.0%
Whooping cough	124,532	2.4%	5.8%	0.0%	0.0%
Measles	91,948	1.8%	4.1%	0.1%	0.0%
Tabes mesenterica (abdominal TB)	77,393	1.5%	3.2%	0.4%	0.0%
Enteric fever (typhoid)	78,421	1.5%	0.6%	3.7%	0.3%
Smallpox	57,422	1.1%	0.8%	2.6%	0.0%

Cause (Registrar General wording)	Deaths 1871-80	Share of all deaths	Share under 5	Share 15-44	Share 65+
Childbirth plus puerperal fever	40,561	0.8%	0	4.3%	0
"Other causes" (prematurity, atrophy, debility, old age and the rest)	1,065,549	20.6%	26.6%	6.2%	33.9%

Shares are my arithmetic. Two in five deaths were of small children. In the reproductive years phthisis alone caused more than a third of deaths. The chest killed at both ends of life. Puerperal fever was 17,944 of 40,561 maternal deaths (44%). Diarrhoea looks smaller than today (8.9% under five against 22% in Jones et al 2003) because many infant diarrhoea deaths were filed under "atrophy and debility" and "convulsions", and because temperate England had diarrhoea mainly in summer. The report for 1870 itself linked fatal diarrhoea to defective water supplies (Registrar General 1872, read only in summary).

3.2 Farr, Massachusetts, Sweden and London William Farr's letter in the First Annual Report of the Registrar General classified 141,607 deaths for the second half of 1837 (Farr 1839, catalogue entry only). I could not read his tables. In Massachusetts in 1880 there were 35,292 deaths: consumption 5,494 (15.6%), pneumonia 3,076 (8.7%) and cholera infantum 2,118 (6.0%). Deaths in the first year of life were 7,190, equal to 16.26 per 100 births, and 34.6% of all deaths were under five. James P. Lynde told the Massachusetts Medical Society that cholera infantum struck infants who were artificially fed (Lynde 1882). I found no continuous Massachusetts series for 1850 to 1900.

The Swedish Tabellverket from 1749 asked parish clergy to report deaths by cause, in 33 categories until 1773, and its commonest entry was an unspecified childhood disease (Hiltunen Maltesdotter and Edvinsson 2025). Smallpox caused about a quarter of Swedish deaths in the epidemic year 1779 and about a fifth in 1784 (Statista, after the Royal College of Physicians, secondary).

The London Bills of Mortality assigned cause through "searchers", elderly women without medical training. In one eighteenth-century bill, consumption caused 3,608 and "convulsions" 2,929 of 18,865 deaths, about 19% and 16% (London Museum, year not stated). These are not diagnoses: infant "convulsions" covers dehydration, meningitis, fever and tetanus. Samuel Preston's Mortality Patterns in National Populations (Preston 1976) modelled cause structure from 43 national registers, and I could not read it. Abdel Omran (Omran 1971) called the pre-modern regime the "age of pestilence and famine", with life expectancy between 20 and 40 years.

4. The killers one by one

4.1 Diarrhoea **What the tradition says.** Every culture gives fluids, rice water, thin porridge, coconut water or salted soups, and many also withhold food or fluids to "rest the bowel" or give purges. The second set of habits kills.

What the record shows. Cholera untreated can kill up to half of those with severe disease, according to WHO officials quoted in press reports, and with adequate treatment the case fatality should be below 1% (WHO 2024). In July and August 1971 at Bongaon in West Bengal, Dilip Mahalanabis and colleagues treated 3,703 Bangladeshi refugees with cholera, mostly with oral fluids because intravenous supplies had run out. Overall case fatality was 3.6%, and 1% in a demonstration unit of 1,190 patients. Camps relying on intravenous fluids alone are reported at 20% to 30% (Mahalanabis et al 1973).

What modern science infers. Munos, Walker and Black (2010) pooled three studies and found oral rehydration solution reduced diarrhoea mortality by 69% (95% CI 51% to 80%), with treatment failure of 0.2%. Their 93% headline is an extrapolation, not a measurement, and the evidence was rated low quality. Zinc was estimated to cut diarrhoea mortality by 23% using hospital admission as a proxy for death (Walker and Black 2010). The 2016 Cochrane review found zinc shortens diarrhoea by about half a day in children over six months, by about a day in malnourished children, gives no benefit under six months, causes more vomiting, and leaves its effect on death uncertain (very low certainty) (Lazzerini and Wanzira 2016).

Prevention works at least as well. Wolf et al (2022) found filtration at point of use cut child diarrhoea risk by 50% (RR 0.50), solar disinfection by 37% (RR 0.63), chlorination by 34% (RR 0.66), handwashing promotion by 30% (RR 0.70) and sanitation by 24% (RR 0.76). Luby et al (2005), in a cluster-randomised trial in Karachi squatter settlements, found plain soap with weekly promotion cut diarrhoea by 53% in children under 15. Wolf et al (2023) attribute 69% of diarrhoea worldwide to unsafe water, sanitation and hygiene. Cairncross et al (2010) estimated that handwashing cuts diarrhoea deaths by 48%, water quality by 17% and excreta disposal by 36%, from mostly poor-quality evidence.

Preventable share. Jones et al (2003) rated 88% of child diarrhoea deaths preventable at full coverage, with oral rehydration the largest single treatment (15% of all child deaths).

4.2 Pneumonia **What the record shows.** Before antibiotics, Tilghman and Finland's series of adult pneumonia in the 1920s and 1930s recorded death in 11% of patients under 30, 27% at 30 to 59 and 69% at 60 and over (IDSA 2008, search snippet only [VERIFY]). Heffron's 1939 monograph, summarised by Musher (2006), reported 58% mortality in bacteraemic type 1 pneumococcal pneumonia and 15% in non-bacteraemic cases. In a 1938 trial of sulphapyridine, mortality was 8% in treated cases against 27% in 100 controls, and a 1943 British Guiana series of 100 children treated with sulphapyridine lost one, against 13.6% in the three previous years (search summaries of period reports, not read in full [VERIFY]).

For children in poor settings today, the cleanest comparison is the 1990 Gadchiroli trial in Maharashtra, India: case fatality was 0.8% among 612 children treated by village health workers with oral antibiotics, against 13.5% in control villages where some families still sought care (Bang et al 1990, read via secondary summary). Reviews state the untreated case fatality "sometimes" exceeds 20%, and that death can come within three days.

What modern science infers. Theodoratou et al (2010) pooled community case-management studies: antibiotic treatment by community workers cut pneumonia mortality by 35% (95% CI 18% to 48%, nine studies) and all-cause child mortality by 21% (12% to 30%, ten studies). Their 70% figure for the Lives Saved Tool is a rule-based adjustment, not a pooled measurement. Treated severe pneumonia had a case fatality of 0.6% and very severe pneumonia 6.5%. Zinc and vitamin A did not help. Sazawal and Black (2003) earlier pooled nine studies and found 24% lower total child mortality and 36% lower pneumonia mortality (JHU summary). Handwashing with soap halved pneumonia in children under five in Karachi (Luby et al 2005).

Preventable share. Jones et al (2003) rated 65% of child pneumonia deaths preventable, less than diarrhoea because no cheap prevention matches clean water.

4.3 Malaria **What the tradition says.** Cinchona bark from the Andes (Cinchona officinalis, C. calisaya, C. pubescens syn. C. succirubra, and the cultivated C. ledgeriana) was used against intermittent fevers from the 1630s. Sweet wormwood (Artemisia annua, leaf) has a long Chinese record for fevers. The part used of cinchona is the bark of trunk and branches.

What the record shows. Italy registered 21,033 malaria deaths in 1887, and Giovanni Battista Grassi argued that the official figures should be multiplied by five (Celli and Grassi, cited in historical reviews). Angelo Celli gave 913 people 0.2 to 0.4 g of quinine a day, by age, in twelve towns and followed 626 untreated people in seven towns: fever

occurred in 5% against 40%. After the state quinine law of 1901, average annual malaria deaths fell from 14,048 in the ten years before 1902 to 5,435 in 1903 to 1911 (Celli, cited in Italian historical reviews read in summary). Frank Snowden (2006) credits organisation as much as the drug.

What modern science infers. Untreated severe falciparum malaria approaches 100% mortality, and treatment reduces it to 15% to 20% (WHO presentation to the Roll Back Malaria case management group, 2012). Insecticide-treated nets cut all-cause child mortality by 17% (rate ratio 0.83, 95% CI 0.77 to 0.89, five trials, 200,833 participants), saving 5.6 lives a year per 1,000 children protected (Pryce, Richardson and Lengeler 2018). WHO does not support Artemisia plant material in any form, including tea, because artemisinin content varies, is often too low to clear parasites, and may breed resistance. One estimate cited by WHO in 2012 is that matching one 500 mg artemisinin tablet would require about five litres of tea a day for seven days (WHO 2019). Cinchona bark contains 2% to 17% total alkaloids, of which quinine is usually 50% to 90% (Distiller magazine overview), or 7% to 10% total alkaloids with about 70% quinine in cultivated bark (drug monograph at drugfuture.com). Simple boiling extracts much less.

Preventable share. Jones et al (2003) rated 91% of child malaria deaths preventable, mostly by nets and prompt antimalarials. Both depend on supply chains that end with the Fall.

4.4 Measles **What the record shows.** In February to June 1875, measles brought back from Sydney on HMS Dido by Ratu Seru Cakobau's party [VERIFY] spread through a Fiji with no prior exposure. Estimates of the dead range from one fifth to one quarter of the population, 30,000 to 50,000 people (JMVH, Fiji Times, secondary accounts that disagree). Fijian police accompanying the chief lost 6% against about 20% in the general population, a hint that care and food mattered. In England 1871 to 1880, measles killed 91,948, 92% of them under five (Registrar General decennial supplement).

In Guinea-Bissau, Peter Aaby's group found that children infected at home from a sibling (secondary cases) died far more often than index cases infected outside, and that crowding mattered more than malnutrition. A case fatality of 21% is reported for Bissau in a secondary account (Aaby et al 1984, read only via later summaries [VERIFY]).

What modern science infers. Portnoy et al (2019) pooled 124 studies from low- and middle-income countries and found a mean case fatality of 2.2% for 1990 to 2015, 1.5% in community studies and 2.9% in hospital studies. Wolfson et al (2009) found a range from 0 to 40.1% and an outbreak median of 5.2%. These modern figures already include partial vaccination, vitamin A and antibiotics.

Measles vaccine is 85% effective given before the first birthday, about 95% at one year or later and 98% after two doses (Sudfeld, Navar and Halsey 2010). Two doses of vitamin A in children with measles cut measles mortality by 62% (95% CI 19% to 82%), while single-dose trials showed no clear benefit. Routine vitamin A supplementation did not significantly reduce measles deaths in the 2022 Cochrane review (RR 0.88, 95% CI 0.69 to 1.11) (Imdad et al 2022).

4.5 Tuberculosis **What the record shows.** In England 1871 to 1880, phthisis caused 36.8% of all deaths at ages 15 to 44. Adding scrofula and abdominal TB (tabes mesenterica), tuberculosis caused about 12% of all deaths, and more if the "hydrocephalus" of children was largely tuberculous meningitis [VERIFY]. Consumption was 15.6% of all deaths in Massachusetts in 1880 (Lynde 1882).

What modern science infers. Tiemersma et al (2011) reviewed the pre-chemotherapy literature: untreated smear-positive pulmonary TB in HIV-negative adults killed 70% within ten years (range 53% to 86%), smear-negative culture-positive disease about 20%, and illness lasted about three years from onset to cure or death. In Malawi, 20% of 658 HIV-positive TB patients died during TB treatment when antiretroviral drugs were not provided, 62% of them in the first two months (Malawi cohort, core.ac.uk record, read in summary [VERIFY]).

TB is the killer the cheap interventions in this report barely touch. Nutrition, ventilation and separating the coughing patient from children slow it. Nothing at the hearth cures it.

4.6 Sepsis: maternal, neonatal, wound **Maternal.** At the First Obstetric Clinic of the Vienna General Hospital, mortality was 18.3% of women delivered in April 1847. Ignaz Semmelweis introduced hand-washing in chlorinated lime in mid-May. Mortality was 2.2% in June and 1.2% in July, and 45 of 3,556 women (1.2%) died in 1848 (Semmelweis, secondary accounts that disagree in detail). In England 1871 to 1880, puerperal fever was 44% of registered maternal deaths. Maternal mortality in English parishes was about 5.0 per 1,000 live births in 1800 to 1850 (Chamberlain 2006). Leonard Colebrook began treating puerperal fever with prontosil at Queen Charlotte's Hospital, London, in January 1936, and the British maternal death rate fell abruptly in the late 1930s (Chamberlain 2006, Loudon 1992 catalogue description). I could not read Loudon's figures on the sepsis share before and after.

Neonatal. In Gadchiroli, India, Abhay and Rani Bang trained village health workers to visit newborns, keep them warm, support breastfeeding and treat suspected sepsis with oral co-trimoxazole and injected gentamicin. Neonatal sepsis case fatality fell from 16.6% (163 cases) to 2.8% (71 cases), and net neonatal mortality fell 62.2% compared with control villages over 1995 to 1998 (Bang et al 1999). Possible serious bacterial infection affects about 7.6% of newborns in poor regions with a pooled case fatality of 9.8%, a figure that mixes treated and untreated infants (Seale et al 2014).

Chlorhexidine applied to the umbilical cord in community settings cut omphalitis by half (RR 0.48) and neonatal mortality by 19% (RR 0.81, 95% CI 0.71 to 0.92) (Sinha et al 2015). Untreated neonatal tetanus kills close to 100%, and two or more doses of tetanus toxoid to the mother cut neonatal tetanus deaths by 94% (95% CI 80% to 98%) (Blencowe et al 2010, abstract). Jones et al (2003) rated neonatal sepsis the most preventable cause of all, at 94%, and neonatal tetanus at 81%.

Wound. Joseph Lister reported in 1870 that 16 of 35 amputation patients (45.7%) died at Glasgow Royal Infirmary in 1864 to 1866, against 6 of 40 (15%) in 1867 to 1870 under carbolic antisepsis (Lister 1870, via Royal College of Surgeons library blog and an Oxford teaching resource). Lister himself conceded the numbers were small, and a later reassessment questions his case selection.

4.7 The cross-cutting protector: breastfeeding Sankar et al (2015) pooled studies of breastfeeding and death. Compared with exclusively breastfed infants under six months, predominantly breastfed infants had 1.5 times the risk of death, partially breastfed 4.8 times and non-breastfed 14.4 times. Not breastfeeding at 6 to 11 months and 12 to 23 months doubled the risk (RR 1.8 and 2.0). These are observational data, but consistent, and they match Lynde's 1882 observation on cholera infantum. Jones et al (2003) rated breastfeeding the single largest preventive intervention, preventing 13% of all child deaths.

5. The ranked map by climate and age

5.1 How the bands differ **Tropical humid band** (West and Central Africa, lowland South and Southeast Asia, Amazon basin). Under five: malaria, pneumonia, diarrhoea, neonatal sepsis and asphyxia, then measles once vaccination lapses. Reproductive age: maternal haemorrhage and sepsis, malaria in pregnancy, and in eastern and southern Africa HIV and TB. Over 60: pneumonia and TB. Partial immunity in exposed adults concentrates malaria deaths in children and pregnant women.

Arid band (Sahel, North Africa, Middle East, dry South Asian plains). Under five: neonatal causes, pneumonia, diarrhoea, and historically measles where malnutrition is common. Malaria is seasonal in the Sahel and absent in true desert. Diarrhoea incidence in African children rises most at 30 to 37.5 degrees C, and water and sanitation infrastructure blunts that effect (World Development 2022 study of 596,522 children [VERIFY]). Reproductive age: maternal causes, TB. Over 60: pneumonia, TB.

Temperate band (Europe, North America, temperate Asia, the 1870 English model). Under five: respiratory infection in winter, diarrhoea in summer, then whooping cough, scarlet fever, measles and the tuberculous diseases of

childhood. Reproductive age: tuberculosis above all, typhoid, maternal sepsis. Over 60: pneumonia and the slow causes of old age. Malaria once reached marshy temperate places such as the Italian lowlands (Section 4.3).

5.2 The one-page table This is the table the book asked for, in the order a lay healer should learn to act. The "untreated case fatality" column gives the best figure found, with its weakness named in Section 4. Evidence grades follow the book's scheme and are explained in the next section.

Order	Killer	Age band that dies	Climate where it leads	Untreated case fatality	Intervention that prevents most	Grade
1	Dehydrating diarrhoea, including cholera	Under 2, the old, the malnourished	All, worst tropical and arid, summer in temperate	Cholera up to 50%, 20-30% in 1971 camps without enough fluid	Oral rehydration by mouth (treatment), clean water plus soap (prevention)	A / A
2	Newborn sepsis and cord infection	First 28 days	All	16.6% before treatment in Gadchiroli, tetanus near 100%	Clean birth, clean cord (chlorhexi-dine where held), warmth, early exclusive breastfeeding, antibiotics for sick newborns	A / B
3	Pneumonia	Under 5, over 60	All, winter in temperate, worst arid nights	Child 13.5% (partly treated controls), adult 11% under 30 to 69% over 60	Count breathing, oral amoxicillin, soap, smoke-free sleeping	A
4	Malaria	6 months to 5 years, pregnant women, non-immune adults	Tropical humid, seasonal Sahel	Severe disease near 100%, 15-20% treated	Treated bed nets, prompt antimalarial (salvaged ACT, quinine or cinchona)	A / B

Order	Killer	Age band that dies	Climate where it leads	Untreated case fatality	Intervention that prevents most	Grade
5	Measles (from year 2 or 3 on)	6 months to 5 years, all ages if virgin soil	All, worst crowded and malnourished	1.5-2.9% modern, 5.2% outbreaks, 20%+ crowded or virgin soil	Vaccination while stock lasts, isolation, two doses of vitamin A, feeding	A
6	Maternal sepsis	Women in the six weeks after birth	All	18.3% of deliveries at worst in Vienna 1847	Washed hands, clean birth, no internal examinations without clean hands	B
7	Tuberculosis	15 to 44, and children in TB households	All, worst crowded and HIV-affected	Smear-positive 70% in ten years	Separate the cougher, ventilate, feed, salvaged TB drugs only as full courses	B
8	Wound sepsis	Working adults, children	All	Amputation 45.7% pre-antiseptic Glasgow	Clean, open, irrigated wounds, boiled dressings, early drainage	B

5.3 A village of 300 and a district of 3,000 These figures are my own inference [VERIFY]. Assume a crude birth rate of 35 per 1,000 and a crude death rate of 25 to 30 per 1,000, typical of the 1870 regime. A village of 300 then sees about 10 births and 7 to 9 deaths a year, three or four of them under five, and a district about 100 births and 75 to 90 deaths.

With pneumonia incidence of 0.28 episodes per child-year (Theodoratou et al 2010) and roughly 45 children under five in the village, there are about 13 episodes a year. At 13.5% untreated case fatality that is close to two deaths a year. At 0.8% with amoxicillin it is one death every eight or nine years. With possible serious bacterial infection in 7.6% of newborns, the district has about 8 septic babies a year and loses about 1.3 of them untreated against 0.2 treated. At 5 maternal deaths per 1,000 births, the village loses a mother about once in 20 years and the district about once in two years. Nets would save about 0.25 child lives a year in the village and 2.5 in the district.

A healer in a village of 300 therefore meets one or two maternal deaths in a working life. Only the district, or the written record, shows the pattern.

6. Is the post-Fall village 1850 again?

No. It differs in seven ways that pull in both directions.

Vaccinated adults. Almost everyone born before the Fall carries vaccine immunity to measles, polio, diphtheria, tetanus and often pertussis. For some years this shields children by herd effect. But babies of vaccinated mothers lose maternal measles antibody at a median of 0.97 months, against 3.78 months for babies of naturally immune mothers (Leuridan et al 2010), so the first post-Fall infants are open to measles almost from birth.

The unvaccinated cohort. Measles spreads unless 92% to 95% of people are immune (PATH explainer). At 10 births a year, by year 3 about 25 to 30 unprotected children make up 8% to 10% of a village, enough for an introduced case to ignite an outbreak, and by year 10 there may be 80, over a quarter of the village [VERIFY]. A village of 300 cannot sustain measles alone, so it will arrive as a sudden epidemic from outside, as in Fiji. Outbreaks after years of good coverage follow this pattern (BMJ Global Health 2020 summary [VERIFY]).

HIV. Before effective treatment, median survival after infection was 10.9 years for people infected at 25 to 34 and 4.0 years for those infected at 65 or older (CASCADE 2000). Interrupting therapy in the SMART trial raised the risk of opportunistic disease or death 2.6-fold (SMART Study Group 2006). Where HIV is common, loss of antiretrovirals brings a wave of adult TB, pneumonia, diarrhoea and wasting in years 1 to 5 that 1850 never saw.

Drug resistance. Mass azithromycin in Niger, Malawi and Tanzania cut child deaths by 13.5% (95% CI 6.7% to 19.8%), most in Niger (18.1%), but macrolide resistance determinants were 7.5 times higher in treated communities at 48 months, with beta-lactam resistance also rising (Keenan et al 2018). A district that spends antibiotics freely will degrade them.

Salvaged drugs. The US Shelf Life Extension Program found 88% of 3,005 lots of 122 well-stored drugs could be extended, by 66 months on average (Lyon et al 2006, secondary). This holds for controlled storage only, and tetracyclines and some other antibiotics should not be used after expiry (secondary sources).

Knowledge. The village has germ theory, oral rehydration and the breathing count, which alone move several killers far below their 1850 levels.

Nutrition and crowding. If food fails, every case fatality above rises. Aaby's work suggests crowding raises measles deaths more than hunger does.

6.1 Year 1, year 3, year 10 (inference from the evidence above [VERIFY]) **Year 1.** Diarrhoea, cholera and typhoid lead as water systems fail. Adults dependent on medicines (insulin, antiretrovirals, TB drugs, dialysis) die in a pulse. Malaria rises as ACT stocks run out.

Year 3. Child diarrhoea and pneumonia dominate, with a steady toll of newborn sepsis and maternal death. Malaria climbs as nets wear out (net lifespan of about three years is commonly cited [VERIFY]). TB rises with crowding, hunger and HIV. A first measles outbreak becomes possible.

Year 10. Measles, whooping cough and diphtheria return in the post-Fall cohort, with large swings between years as with smallpox in eighteenth-century Sweden. TB is a leading adult killer. As post-Fall girls become mothers in years 15 to 20, neonatal tetanus will return because they carry no toxoid immunity [VERIFY]. The child share of deaths rises towards the English 40%.

7. Village memory, the tables and the models

Village memory will name "fever", "chest", "the runs", "fits", "wasting" and "childbed fever". Registrars misfiled too, and the models may count malnutrition twice and in data-poor countries rest on verbal autopsy (Byass et al 2013). Where all three voices agree, the finding is robust. The young child dies of diarrhoea, chest infection and, in the tropics, malaria. The young adult dies of tuberculosis. The mother dies of bleeding and fever. The old die of pneumonia. The pre-1900 record misleads in four ways: it has no HIV and no resistance, it includes smallpox, it hides diarrhoea under other names, and its infants had mothers with natural measles immunity. It also shows outcomes without the knowledge the village will have.

Deaths not preventable at any rung the book describes: most very preterm babies [VERIFY threshold], severe birth asphyxia, obstructed labour without surgery, major haemorrhage without transfusion, advanced HIV, drug-resistant TB, cerebral malaria once coma sets in without injectable drugs, and severe pneumonia needing oxygen. Jones et al (2003) found no level-1 intervention for birth asphyxia and rated only 39% of asphyxia deaths preventable even with the full package.

Evidence grades

Grades apply to the effect on death unless stated.

Remedy or practice	What tradition says	What the record shows	What modern science infers	Grade
Oral rehydration (sugar-salt, cereal-based, WHO salts)	Fluids, rice water, soups. Some traditions withhold fluid (harmful)	Bongaon 1971: 3.6% case fatality in cholera, 1% in demonstration unit	69% fewer diarrhoea deaths (low-quality studies), 0.2% treatment failure. Rice-based ORS cut cholera stool output by 67 ml/kg in children (Fontaine et al 2000)	A
Zinc in diarrhoea	Not traditional	None	Shorter illness over 6 months, uncertain effect on death, no benefit under 6 months	A for illness, D for death
Handwashing with soap	Ritual washing in many faiths	Semmelweis 1847	30% less diarrhoea (Wolf 2022), 50% less child pneumonia (Luby 2005)	A
Safe water and sanitation	Boiling, clay pots, latrines	Sanitary reform 1850 to 1914 (Szreter 1988)	Filter 50%, solar 37%, chlorine 34%, sanitation 24% less diarrhoea	A
Insecticide-treated nets	Untreated nets, smoke	None pre-1980s	17% less child mortality, 5.6 lives per 1,000 children per year	A
Vitamin A supplementation	Liver, red palm oil, greens in many cultures	None	12% less all-cause mortality (RR 0.88), contested by DEVTA (RR 0.96, not significant)	A, contested
Vitamin A, two doses in measles	Not traditional	None	62% fewer measles deaths	A

Remedy or practice	What tradition says	What the record shows	What modern science infers	Grade
Exclusive breastfeeding to 6 months	Universal, but pre-lacteal feeds and colostrum discard are common	Cholera infantum in the "artificially nourished", 1880s	14.4-fold risk of death if not breastfed under 6 months	B
Clean birth, washed hands, clean blade and tie	Widespread in midwifery	Semmelweis 1847, puerperal fever 44% of English maternal deaths 1871-80	Component of 55% preventable neonatal deaths (Jones 2003)	B
Chlorhexidine cord care	Ash, dung or oils on cords in some cultures (harmful)	None	19% fewer neonatal deaths in community trials, half the omphalitis	A
Tetanus toxoid to mothers	None	None	94% fewer neonatal tetanus deaths	A (moderate quality)
Oral amoxicillin for child pneumonia by lay workers	Herbal chest remedies, poultices	Sulphapyridine trials 1938 to 1943	35% less pneumonia mortality, 21% less all-cause	A
Home-based newborn care with sepsis treatment	Confinement and warming customs	Gadchiroli 1995-98, 62% fall in neonatal mortality	Replicated in part in other South Asian trials [VERIFY]	A/B
Measles vaccination	None	None	85% to 98% effective by age and doses	A
Quinine or cinchona bark for malaria	Andean and Jesuit tradition	Italy 1901 to 1911, deaths fell from 14,048 to 5,435 a year	Effective but narrow margin, resistance exists [VERIFY]	B
Artemisia annua tea or leaf	Chinese fever tradition	None reliable	Content variable, often too low, resistance risk, WHO advises against	X as sole treatment
Withholding food or fluid in diarrhoea, purging	Common folk practice	Associated with wasting deaths	Harmful	X
Separation of the TB patient, ventilation, food	Sanatorium tradition	Mixed	Plausible, not trial-proven for mortality	C
Antiseptic wound care	Wine, honey, vinegar, tar across cultures	Lister 1867-70, 45.7% to 15% (small, selected)	Plausible, consistent	B

Means ledger

Each row gives what can be done and the best estimate of what it changes.

Diarrhoea

Rung	What can be done	What it changes
Hands and knowledge	Keep breastfeeding, keep feeding, give any safe fluid, recognise dehydration (sunken eyes, slow skin pinch, lethargy)	Prevents many deaths from wrong practice. Unquantified
Hearth	Sugar-salt solution or salted rice water, boiled water, soap and ash handwashing	Up to 69% fewer diarrhoea deaths (ORS), 30% to 50% less diarrhoea (water, soap)
Garden and still	Rice or other cereal-based solution, soap making, filters of sand and charcoal, solar bottles, latrines	Cereal ORS reduces stool output in cholera. Filters 50% less diarrhoea
Village dispensary	Packaged WHO salts if salvaged, zinc tablets, a microscope for amoebae and Giardia, antibiotics for bloody diarrhoea and cholera	Zinc 23% (proxy). Antibiotics for dysentery estimated 3% of all child deaths prevented (Jones 2003)
District infirmary	Nasogastric rehydration, intravenous fluid made from distilled water and salt if sterile production exists	Severe cholera survivable at below 1%
Pre-Fall hospital	Intravenous fluids, electrolytes, intensive care	Case fatality below 1%

Pneumonia

Rung	What can be done	What it changes
Hands and knowledge	Count breaths for a full minute, look for chest indrawing, keep feeding and breastfeeding, sit up, keep warm	Recognition only. Without antibiotics, about 13.5% of children still die
Hearth	Soap, smoke-free sleeping space, warm but ventilated room	Soap halves child pneumonia (one trial). Smoke effect not quantified here
Garden and still	Steam, honey for cough over age 1 [VERIFY]	Comfort, not survival
Village dispensary	Salvaged oral amoxicillin or co-trimoxazole, a timer, a trained lay worker	35% less pneumonia mortality, case fatality towards 0.8%
District infirmary	Injected penicillin or gentamicin, oxygen concentrator if power exists	Very severe pneumonia 6.5% case fatality with antibiotics
Pre-Fall hospital	Oxygen, ventilation, culture-guided antibiotics, vaccines (pneumococcal, Hib)	Further reduction, especially in the old

Malaria

Rung	What can be done	What it changes
Hands and knowledge	Sleep away from standing water, cover skin at dusk, recognise fever with convulsions or drowsiness	Small, unquantified
Hearth	Nets (salvaged), drain puddles, smoke	Untreated nets less than treated. Treated nets 17% all-cause child mortality
Garden and still	Cinchona plantation where the climate permits (decades to mature [VERIFY]), bark extraction [VERIFY method]	Partial quinine supply, uncertain dosing
Village dispensary	Salvaged ACTs, rapid tests, microscope with Giemsa-type stain	Uncomplicated malaria nearly always survivable if treated early
District infirmary	Injected quinine or artesunate, blood transfusion	Severe malaria from near 100% to 15% to 20%
Pre-Fall hospital	Intravenous artesunate, intensive care	Fewer deaths than with quinine in trials [VERIFY]

Measles

Rung	What can be done	What it changes
Hands and knowledge	Isolate the sick child from infants, keep feeding, clean eyes, watch for chest and ear complications	Aaby's secondary-case effect suggests isolation lowers dose and deaths
Hearth	Food, fluids, vitamin A-rich foods (liver, egg yolk, orange vegetables, red palm oil from Elaeis guineensis fruit)	Plausible, unquantified
Garden and still	Grow vitamin A-rich crops	Plausible, unquantified
Village dispensary	Salvaged vitamin A capsules, antibiotics for pneumonia after measles	Two doses of vitamin A 62% fewer deaths
District infirmary	Measles vaccine only if a cold chain can be kept (salvaged, refrigerated, used promptly)	85% to 98% protection
Pre-Fall hospital	Vaccination programme, oxygen, intensive care	Near elimination

Tuberculosis

Rung	What can be done	What it changes
Hands and knowledge	Recognise cough of more than two weeks with weight loss and night sweats, separate sleeping, cover coughs	Slows spread, unquantified

Rung	What can be done	What it changes
Hearth	Ventilated sleeping rooms, sun, adequate food	Plausible
Garden and still	Food security	Plausible
Village dispensary	Microscope with acid-fast stain (Ziehl-Neelsen) if reagents salvaged	Diagnosis only
District infirmary	Salvaged first-line TB drugs, given only as full six-month courses	Cure in most drug-sensitive cases
Pre-Fall hospital	Molecular testing, second-line drugs, antiretrovirals	Cure of most cases including resistant

Sepsis (maternal, neonatal, wound)

Rung	What can be done	What it changes
Hands and knowledge	Wash hands before touching a birthing woman or newborn, cut the cord with a boiled blade, tie with boiled thread, dry and warm the baby skin to skin, breastfeed within the hour	Large but unquantified fraction of the 94% (Jones 2003)
Hearth	Boiled cloths, soap, clean birth kit, wound washing with boiled water	As above
Garden and still	Alcohol, honey and soap for wounds, chlorhexidine only if salvaged	Chlorhexidine 19% fewer neonatal deaths
Village dispensary	Oral and injected antibiotics for sick newborns and feverish mothers, trained birth attendant	Neonatal sepsis 16.6% to 2.8%
District infirmary	Surgery for retained placenta and abscess drainage, uterotonic drugs if salvaged, sterile room	Maternal sepsis from Vienna-level towards modern
Pre-Fall hospital	Blood culture, broad antibiotics, caesarean section, intensive care	Maternal sepsis rare

Harm test

Oral rehydration solution. Too much salt causes hypernatraemia, with irritability, convulsions and death, most dangerous in infants. Too much sugar worsens diarrhoea. Dissolve in boiled, cooled water. A little too dilute is safe. Signs of harm: increasing irritability, swelling of eyelids (too much fluid or salt), a child who will not drink. Action: stop, make a fresh batch with careful measures, give breast milk and plain water alternately. Teach with the same spoon every time.

Zinc. Vomiting. No benefit under six months. Long courses at high dose could cause copper deficiency [VERIFY].

Antibiotics (amoxicillin, co-trimoxazole, gentamicin). Penicillin allergy and anaphylaxis. Gentamicin damages kidneys and hearing if overdosed or given too long, especially in the dehydrated. Co-trimoxazole can cause severe skin reactions and is unsafe in the first weeks of life except under protocol [VERIFY]. Expired tetracyclines may

be dangerous. Over-use breeds resistance (Keenan et al 2018). Never give antibiotics for watery diarrhoea except suspected cholera.

Vitamin A. Megadoses cause bulging fontanelle, vomiting and headache in infants. Do not give treatment doses if a dose was given within the last month. In pregnancy, high doses are teratogenic, so give food sources, not capsules [VERIFY].

Quinine and cinchona. Cinchonism (ringing ears, deafness, nausea, blurred vision), low blood sugar, heart rhythm disturbance. Bark preparations vary several-fold in alkaloid content, so dose is unknowable without assay. Never give with other quinoline drugs.

Artemisia tea. Underdosing that leaves parasites alive, delays effective treatment, and may select resistance. Misidentification with other Artemisia species (for example A. absinthium, wormwood, whose thujone is neurotoxic) is possible [VERIFY].

Chlorhexidine. Delays cord separation by 1.75 days. The 4% solution is for the cord only. Never put it in eyes or ears. Ash, dung and oils on the cord, used in some traditions, carry tetanus.

Measles vaccine. Must stay cold and be used within hours of mixing [VERIFY]. Do not give to the severely immunosuppressed.

Withholding food or breast milk in illness. Kills by wasting. The commonest harmful tradition in this report.

Red flags

These signs mean death or disability is likely without what the village cannot give. For each, what to do anyway.

- **Diarrhoea:** a child too weak to drink, unconscious, or with no urine for 12 hours despite fluids. Give fluid by spoon every minute or by nasogastric tube if trained. Keep warm. Keep giving sips even when hope seems gone.
- **Pneumonia:** chest indrawing, grunting, blue lips, inability to drink, convulsions or a breathing rate above 70 a minute in an infant [VERIFY]. Give antibiotics if held, sit the child up, breastfeed little and often. Without oxygen some will die whatever is done.
- **Malaria:** fever with convulsions, coma, deep breathing, dark urine or severe pallor. Give the strongest antimalarial held, by injection if trained. Treat fever with tepid sponging. Coma without injectable drugs is usually fatal.
- **Measles:** pneumonia, dehydration, clouding of the cornea (blindness follows), or convulsions after the rash. Give vitamin A, antibiotics for chest infection, fluids, eye cleaning.
- **Newborn:** not feeding, cold or hot to touch, fast breathing, convulsions, yellow on the first day, red skin spreading from the cord, stiff jaw (tetanus). Keep skin to skin, feed expressed milk by cup, give antibiotics if held. Tetanus in a newborn is near-certainly fatal without intensive care. Record it: it means birth hygiene has failed.
- **Mother after birth:** fever above 38 degrees C, foul discharge, abdominal pain, fast pulse in the first six weeks. Give antibiotics if held and fluids. Heavy bleeding not controlled by rubbing the uterus and breastfeeding is beyond the village.
- **Tuberculosis:** coughing blood, rapid weight loss, breathlessness at rest. Without drugs, give food, rest, separation from children, and honest prognosis. Many die over months to years.
- **Wound:** spreading redness, red streaks, foul smell, crackling under the skin, jaw stiffness. Open and drain, wash with boiled water, antibiotics if held. Gas gangrene and tetanus kill without surgery and intensive care.

Honest comfort: when death is coming, keep the patient warm, clean, without thirst and as free of pain as the village can manage, with the family near. Say what is happening in plain words. Record the death, its signs and what was tried, because the record is how the next child is saved.

The case against

Against the hospital romance. Thomas McKeown, as summarised by his critic Simon Szreter (1988), argued that the nineteenth-century fall in mortality came mostly from better nutrition and living standards before effective medicine existed. Szreter replied that McKeown's categories cannot carry that weight and that public health intervention after the 1860s (water, sewers, housing, preventive services) drove the decline. Neither credits the hospital [VERIFY]. This supports the book's emphasis on water, soap, food and birth hygiene over drugs.

Against the single-intervention champions. The 63% "preventable" figure of Jones et al (2003) assumes full coverage of 23 interventions delivered by working health systems. Lives Saved Tool figures for ORS (93%) and pneumonia management (70%) exceed the pooled measured effects (69% and 35%). The vitamin A case divides experts. The DEVTA trial in one million children in Uttar Pradesh found a non-significant 4% reduction (Awasthi et al 2013), while Sommer, West and Martorell criticised its execution. A careful reader should take the lower estimate for every intervention.

Against the modelled tables. Peter Byass and colleagues (2013) questioned how much of GBD rests on modelling rather than data in the poorest countries, where most deaths go uncertified.

Against the herbal romance. WHO advises against Artemisia plant material in any form for malaria. Cinchona bark works but its dose is unknowable without assay. Traditional cord dressings and fluid restriction kill. No plant in this report replaces amoxicillin, rehydration or a vaccine.

Against the historical mirror. The 1870 table cannot be used as a forecast without the adjustments in Section 6.

10-line summary

1. Two in five deaths in an 1870s-style population are of children under five (England 1871-80: 40.2%).
2. Diarrhoea, pneumonia and newborn sepsis are the leading child killers in every climate, joined by malaria in the tropics.
3. Tuberculosis caused 36.8% of deaths at ages 15 to 44 in England 1871-80, and untreated smear-positive TB kills 70% in ten years.
4. Pneumonia kills the old: 69% of pre-antibiotic patients over 60 died in one large series.
5. Oral rehydration, clean water and soap are hearth-level, Grade A, and between them address most diarrhoea deaths.
6. Breastfeeding is the largest single preventive act for infants: non-breastfed infants under six months die at 14 times the rate.
7. Oral amoxicillin in lay hands cut child pneumonia deaths by about a third in pooled studies and case fatality to below 1% in Gadchiroli.
8. Clean birth, clean cord, warmth and lay treatment of newborn sepsis cut neonatal deaths by 62% in Gadchiroli.
9. Measles will return as an epidemic killer within a few years as unvaccinated children accumulate past the 5% to 8% susceptible threshold.
10. HIV, drug resistance and drug-dependent adults make the first post-Fall years worse than 1850, while knowledge makes later years better.

Open questions

- The true untreated case fatality of childhood pneumonia in a modern malnourished population, since every control group was partly treated.
- Whether vitamin A supplementation still saves lives where deficiency is moderate (DEVTA against the earlier trials).
- How much of the 1871-80 "other causes" and "convulsions" was diarrhoea, sepsis and TB.

- How quickly measles will return in a district of 3,000 with intermittent contact with towns, and what case fatality it will bring in post-Fall nutrition.
- Whether cereal-based ORS beats sugar-salt outside cholera.
- How long salvaged antibiotics retain potency in uncontrolled storage.
- Preston's (1976) cause structure model and Farr's 1839 tables, which I could not read.

Sources to read in full

1. Jones et al (2003), Lancet, for the intervention-by-cause tables.
2. Registrar General 1871-80 via Vision of Britain, for cause by age before antibiotics.
3. Liu et al (2016), Lancet, causes of child death 2000-15.
4. Theodoratou et al (2010), for honest pooled pneumonia effects.
5. Bang et al (1999), Lancet, the template for a lay newborn service.
6. Tiemersma et al (2011), PLoS ONE, untreated TB.
7. Wolf et al (2022), Lancet, water, sanitation and handwashing.
8. Loudon (1992), Death in Childbirth.
9. Szreter (1988), on what drove the Victorian decline.
10. Portnoy et al (2019), measles case fatality.

At the bedside after the Fall

Household

Minimum viable version. Breastfeed exclusively for six months and continue to two years. Boil or filter drinking water, store it covered, pour do not dip. Wash hands with soap or ash before food and after the latrine. Know the sugar-salt recipe by heart and start it at the first loose stool. Count a sick child's breaths. Keep newborns skin to skin and dry. Keep the coughing adult in a separate, ventilated sleeping place.

What it needs. A one-litre measure, a teaspoon kept for the purpose, salt, sugar, soap or ash, a covered water pot, a clock or a counted rhythm for one minute.

First failure to expect. Salt over-measured in the rehydration drink, or fluids stopped because "the diarrhoea got worse".

Village of 300

Minimum viable version. One trained lay healer and one trained birth attendant. Clean birth kits (boiled blade, boiled thread, clean cloth, soap). A protected well or spring and a latrine programme. A breathing-count and dehydration chart on the dispensary wall. A small salvaged stock of amoxicillin, rehydration salts, zinc, vitamin A, antimalarials where needed, kept dry and cool and logged.

What it needs. Salvaged drugs and a ledger of lots and expiry dates. A register of births and deaths with cause in plain words. Nets in malarial zones. Seeds of vitamin A-rich crops: carrot (Daucus carota, root), orange-fleshed sweet potato (Ipomoea batatas, tuber), squash (Cucurbita species, fruit) and dark leafy greens.

First failure to expect. The antibiotic stock is spent on coughs and colds within months, leaving nothing for the child with chest indrawing.

District of 3,000

Minimum viable version. A nurse or the most experienced healer, a ten-bed infirmary with a clean birth room, a microscope with acid-fast and malaria stains, and a drug store controlled centrally. A measles plan: vaccination while

any refrigerated vaccine remains, then rapid isolation and vitamin A when the first case appears. A TB register. A monthly gathering of village death registers.

What it needs. Refrigeration (solar if possible), sterile water production, salvaged injectable antibiotics and antimalarials, staining reagents, training days for village healers, and the cause-of-death register.

First failure to expect. Measles arrives through a market or a traveller in a cohort nobody has counted, and kills a cluster of small children in a few weeks.

Protocols

Doses below are taken from WHO guidance as reported in at least two sources unless marked. A lay healer should still check against any salvaged product label.

Protocol 1. Dehydrating diarrhoea in a child

1. Check: number of loose stools, blood or not, drinking eagerly or unable to drink, sunken eyes, skin pinch on the belly slow to return, lethargy.
2. Make the rehydration drink. Boil water and let it cool. Into exactly 1 litre, stir 6 level teaspoons of sugar and half a level teaspoon of salt until dissolved (rehydrate.org, Alberta Health Services). Do not boil after mixing. Tolerance: a little more water is safe, more salt is not. Taste: no saltier than tears [VERIFY]. WHO packaged salts per litre contain 2.6 g sodium chloride, 13.5 g glucose, 1.5 g potassium chloride and 2.9 g trisodium citrate (WHO 2002).
3. Alternative: rice water made by boiling rice (Oryza sativa, grain) in plenty of water with the same half teaspoon of salt per litre [VERIFY on salt quantity in cereal solutions].
4. Give after every loose stool. Under 2 years: about 50 to 100 ml (a quarter to half a cup). Age 2 and over: half to one 250 ml cup [VERIFY: WHO bands vary by source].
5. If the child vomits, wait 10 minutes and give again slowly, a spoonful every one to two minutes [VERIFY].
6. Keep breastfeeding throughout. Restart food as soon as the child will eat.
7. Zinc if held: 10 mg daily under 6 months, 20 mg daily from 6 months, for 10 to 14 days (WHO/UNICEF 2004 as cited in PMC1370961 [VERIFY second source]). The Cochrane review finds no benefit under 6 months.
8. Red flags: unable to drink, unconscious, blood in stool, no urine for 12 hours. Go to the dispensary.
9. Record the episode, the fluid given, and the outcome.

Protocol 2. Cough or difficult breathing in a child

1. Calm the child. Lift the shirt. Count breaths for a full 60 seconds.
2. Fast breathing is 60 or more under 2 months, 50 or more at 2 to 11 months, 40 or more at 12 months to 5 years (WHO IMCI 2014 chart and 2019 young infant update).
3. Look for chest indrawing (lower chest sucks in on breathing in), grunting, blue lips, inability to drink, convulsions.
4. Fast breathing or indrawing in a child aged 2 to 59 months who can drink: oral amoxicillin at least 40 mg/kg per dose, twice daily, for 5 days. A 3-day course is acceptable for fast breathing alone in low-HIV settings (WHO 2014 policy brief and WHO 2024 guideline).
5. Any danger sign, or any sick infant under 2 months: the first dose of antibiotic at once, then to the dispensary or infirmary for injected treatment.
6. Keep breastfeeding, clear the nose, sit the child upright, keep warm without smoke.
7. Check again at 48 hours. If breathing is not slower, change antibiotic if held and refer.
8. Record.

Protocol 3. Clean birth and the first week

1. Birth attendant washes hands with soap for at least the time to sing a short song, nails short.
2. Clean surface and a clean cloth beneath the mother. Boil the blade and two cord ties for 10 minutes [VERIFY on boiling time].
3. Deliver the baby onto the mother's belly. Dry at once with a warm cloth, discard the wet cloth, cover with a dry one, skin to skin.
4. Tie the cord in two places, cut between with the boiled blade. Apply nothing to the cord except chlorhexidine 4% [VERIFY concentration] if held. Keep the stump dry and uncovered.
5. Put the baby to the breast within the first hour. Give colostrum. No other food or water for six months.
6. Visit days 1, 3 and 7 at least. Look for the newborn red flags. Count breaths: 60 or more is fast.
7. If the baby is not feeding, too hot or too cold, breathing fast, convulsing or has spreading redness at the cord, give antibiotics if held and the dispensary is reachable.
8. Watch the mother for fever, foul discharge and bleeding for six weeks.

Protocol 4. Measles

1. Isolate the sick child from infants and pregnant women. The mother stays with the child.
2. Vitamin A: 50,000 IU under 6 months, 100,000 IU at 6 to 11 months, 200,000 IU at 12 months and over, on two consecutive days, with a third dose 2 to 4 weeks later if there are eye signs. Skip if a dose was given in the last month (Cochrane review of vitamin A in measles and Royal Children's Hospital Melbourne guidance).
3. Feed, breastfeed, give fluids. Clean the eyes with boiled cooled water.
4. Count breaths daily. Treat pneumonia as in Protocol 2.
5. Record the case and tell the district at once.

Protocol 5. Fever in a malarial zone

1. Any fever in a child under 5 in a malarial area is malaria until proved otherwise.
2. Test if tests are held. Treat with the salvaged first-line antimalarial at the label dose.
3. Danger signs (convulsion, drowsiness, deep breathing, unable to drink): first dose at once and move to the infirmary.
4. Keep children and pregnant women under nets from dusk to dawn. Mend nets weekly.

Protocol 6. Chronic cough in an adult

1. Cough for more than two weeks, with weight loss, fever or night sweats, suggests TB.
2. Separate sleeping space, open window, cover coughs, sputum into a covered pot to be burned.
3. Feed well. Examine the household's children.
4. Treat only with a complete six-month course of first-line drugs at the district. Never give a partial course.

Numbers to carry

1. One litre of boiled water, six level teaspoons of sugar, half a level teaspoon of salt.
2. Count breaths for a full minute: 60 under 2 months, 50 up to 1 year, 40 up to 5 years.
3. Amoxicillin 40 mg/kg per dose, twice a day, 5 days.
4. Breastfeed only, nothing else, for 6 months. Not breastfed means 14 times the risk of death.
5. Two in five of the dead in a pre-antibiotic village are under five.
6. Untreated smear-positive TB kills 70% within ten years.
7. Severe malaria untreated kills nearly all, treated about one in six.
8. Measles spreads once more than about 5% to 8% of people are unprotected.
9. Neonatal sepsis untreated killed one in six in Gadchiroli, treated about one in thirty-five.

10. Handwashing with soap halves child pneumonia and diarrhoea in the best trial.

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