TR-14 Traditional midwifery across cultures: dais, parteras, sages-femmes and the evidence on traditional birth attendants

HEALING after the FALL, research library, TR-14

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

How to read this

MA-01 holds normal birth, its time limits, its kit and the three delays. MA-02 holds bleeding, misoprostol and ergot. FO-04 holds the lay health worker, Gadchiroli and the newborn visit. TR-07 holds African healers and labour herbs. SY-04 holds the rules for restricted knowledge (THRIVING library, MA-01, MA-02, FO-04, TR-07, SY-04). Their protocols are not repeated. This report covers the woman who attends births without formal schooling: who she is in four traditions, what the trials found when she was trained, what worked better, which of her practices save lives and which kill, and what a village after the Fall should teach her, in order. Each tradition comes first on its own terms, evidence beside it (owner's ruling, 12 October 2026). MA-05 and TR-09, named as related, are not yet in the library.

1. Findings by section

1.1 One figure, many names

Almost every society has had a woman, usually older and a mother herself, whom women call when labour starts. In Hindi and Urdu she is the *dai*, in Mexico the *partera*, in Guatemala the *comadrona*, the co-mother, in French the *sage-femme*, the wise woman, and in German the *Hebamme* or *Wehmutter*. Public health from the 1970s called her the traditional birth attendant, or TBA, defined in 2004 as a traditional, independent and non-formally trained provider based in the community, outside the health system (WHO, ICM and FIGO 2004). That definition describes her by what she lacks. The traditions describe her by what she has: a calling or an inheritance, a body of practice and a place in her community.

Her reach is large. Demographic and Health Surveys in 44 countries from 1994 to 2004 found TBAs at 29% of rural births (range 2 to 79%) and 12% of urban births, and no attendant at 5% of rural births (Sibley and Sipe 2006). After the Fall she will attend most births, or no one will.

1.2 The dai of North India

On its own terms. In Jamui district, Bihar, the dais interviewed by Somani are women of the Manjhi community, a Scheduled Caste. Moohiya Devi had attended births for about 50 years, Laljitya Devi for 40, and Puja Devi was the third generation of her family in the work (Somani, IDR, about 2022). The work is inherited and tied to caste. In the purity rules that frame North Indian birth, birth blood, the cord and the placenta pollute, so cutting the cord and handling the afterbirth fell to the lowest castes, and older ethnographies name dais from leatherworker, sweeper and barber castes (Briggs 1920 and Minturn and Hitchcock 1963, seen only as citations [VERIFY]). The dais describe it otherwise. They call it *bhalai ka kaam*, work for the good of others, and Moohiya Devi rejects the idea that birth

pollutes. Their skills include massage in pregnancy and after birth, settling the baby by hand, delivering, cutting the cord and caring for mother and child in the days after (Somani, IDR).

Status and fees. Pay in Jamui was INR 500 to 2,000 for a delivery or a course of massage, often with a sari, rice or lentils (Somani, IDR). The Jefferys and Lyon in Bijnor, Uttar Pradesh, described the dai as a poorly paid menial whose knowledge was thinner than the romantic picture suggests (Jeffery, Jeffery and Lyon 1989, catalogue entry only [VERIFY]). Janet Chawla's MATRIKA project, from 1998 to 2001, recorded dais' own understanding of the body and argued that state programmes made them scapegoats for deaths rooted in poverty and absent hospitals (search summaries only [VERIFY]). This is knowledge the holders chose to publish, which SY-04 treats as publishable in the form they gave it (category 2).

The evidence beside it. India's trials did not train dais alone. In Gadchiroli, Bang trained village health workers and also the dais of the trial villages (Bang 1999, via THRIVING library, FO-04). The home practices the Shivgarh trial targeted were late breastfeeding, discarded colostrum, early bathing and substances on the cord (Kumar 2008, abstract only). Massage has no trial evidence for or against in this setting [VERIFY: none found]. For the Fall, the lesson of caste is that despised work stays poorly done. A village must pay and honour its midwife.

1.3 The partera of Mexico and the comadrona of Guatemala

On their own terms: hot and cold. In Tepoztlán, Morelos, Ester Botteri and Jacqueline Bochar Pizarro worked from January to April 2017 with the partera Angelina Martínez Miranda and others (Botteri and Bochar Pizarro 2019, full text read). The partera's body is the Mesoamerican body described by Alfredo López Austin: hot and cold, open and closed, with the navel, *tipté*, at its centre. Women are colder than men and lose heat in menstruation and above all in birth, which opens the body to cold *aires*. The partera keeps heat in, closes what birth opened and sets the organs and the baby in their places.

In labour she gives hot drinks: cinnamon (*Cinnamomum verum*, bark), ginger (*Zingiber officinale*, rhizome), rue (*Ruta graveolens*, aerial parts) with chocolate to restore heat and open the cervix, epazote (*Dysphania ambrosioides*, leaves) and zoapatle (*Montanoa tomentosa*, leaves). The *temazcal*, the steam bath, warms before and after birth. With the *rebozo*, the long shawl, she rocks the hips, and with the *sobada*, the massage, she settles a baby lying breech or across. After birth she may give zoapatle to bring the placenta or stop bleeding, árnica for tears, and star anise and rice water for milk. Eight days later comes the *cierre*, the closing: a bath of hot herbs (rue, lavender, rosemary, sage, *Tanacetum balsamita*, calendula), a sobada to put the organs back, and the rebozo tied seven times, from head to feet, to close the body against *malos aires*. The article's argument is that this knowledge connects the woman to her own power in birth.

On their own terms: the calling. Among the highland Maya of Guatemala the comadrona does not choose the work. She is called through dreams in which a saint or an ancestor midwife appears, through objects found in her path or through signs at her own birth, and illness follows if she refuses (Wikipedia, Midwifery in Maya society, secondary). Barbara Rogoff describes Tz'utujil midwives in San Pedro la Laguna taught by ancestor midwives in dreams (Rogoff 2012). Walsh's interviews with 10 Maya TBAs found three themes: sacred calling, sacred knowledge and sacred ritual (Walsh 2006, abstract only). She visits from about the third month, massages, prays, attends and receives gifts, not a fee (Wikipedia, Midwifery in Maya society).

Guatemala registered about 22,500 comadronas, who attended about 31% of births nationally and up to 60% in indigenous regions. Maternal mortality in 2013 was 113 per 100,000 live births and more than twice as high among indigenous women. Comadronas said they were reluctant to refer because women were mistreated at hospital and they themselves humiliated there (Kühlen 2017).

The evidence beside it: zoapatle. The name is Nahuatl, *cihuatl*, woman, and *patli*, medicine. Martín de la Cruz recorded it in 1552 and Sahagún about 1570 as a plant to bring on contractions, and the tradition held that it worked best after the birth, for a slack uterus and heavy bleeding (Montoya-Cabrera 1998, full text read). That reservation

was wise. At the rural hospital in Tlaxiaco, Oaxaca, eight women given *yucuyahui*, the Mixtec name, by curanderas or parteras during labour all bore babies with cardiorespiratory depression who needed resuscitation. Mean Apgar scores were 4.5 at 1 minute and 7.4 at 10 minutes, recovery took a mean of 11.9 hours (10 minutes to 36 hours), and more infusions gave lower scores (r = -0.65). Three women had also been given cane spirit or mezcal. At least 20 *Montanoa* species grow in Mexico, so the identity and strength of any bundle is uncertain (Montoya-Cabrera 1998). Zoapatle in labour is grade X. After the placenta it is grade D, untested against massage or misoprostol (MA-02).

The rest. Rue is a traditional abortifacient with phototoxic sap, and epazote oil contains toxic ascaridole [VERIFY: neither from a source read here, see PH-02 when written]. Neither has trial evidence in labour (D at best). The temazcal after birth is D, and a sweat bath is a heat stress to be avoided with fever, dehydration or heart disease (THRIVING library, TR-08). The rebozo for comfort is harmless and fits the trial evidence on movement and company (D, continuous support A in MA-01). Turning a breech baby by massage resembles external cephalic version, which in skilled hands works, but it can separate the placenta or tangle the cord, and the sobada itself has not been studied [VERIFY: none found]. The cierre is D and harmless.

1.4 The sage-femme and the European record

On its own terms. European midwifery before the eighteenth century was a women's craft learned by apprenticeship, licensed in England by the Church and in German cities by the town [VERIFY], and written down by a few midwives who could print. Jane Sharp, an English midwife of more than thirty years' practice, published *The Midwives Book, or the Whole Art of Midwifry Discovered* in 1671, in six books from anatomy to the care of mother and child. She advised a position of the woman's choosing, including a birth stool, and kneeling face down for very fat women. She defended the midwife against the male surgeon but urged midwives to learn anatomy, since "It is not hard words that perform the work" (Sharp 1671, via Wikipedia, Jane Sharp). Her name is not among almost 500 London midwives' licences of 1661 to 1669, so where she practised is unknown. I could not read the original.

Sara Read's account of English practice in the period shows two practices now called harmful in Africa and Asia. The cord was cut four fingers' breadth from the belly and the navel anointed with ash and covered with lint, and mothers did not suckle for the first days because colostrum was distrusted (Read 2014).

Justine Siegemund, born Diettrich in Rohnstock, Silesia, on 26 December 1636, turned to midwifery after midwives mistook her own prolapse for a pregnancy when she was about 20. She practised from 1659, at first without fee for poor women, became city midwife of Liegnitz (Legnica) in 1670 and court midwife to the Elector of Brandenburg in 1683, and died in Berlin on 10 November 1705. Her book of 1690, *Die Chur-Brandenburgische Hoff-Wehe-Mutter*, is a dialogue with a pupil named Christina. It teaches two-handed internal turning of a baby lying across, bringing down a foot with a ribbon or sling, and puncturing the membranes to slow bleeding when the placenta lies over the cervix. She claimed close to 6,200 births and seldom used drugs or instruments. Physicians attacked her, and the Frankfurt an der Oder faculty cleared her of malpractice (Wikipedia, Justine Siegemund, secondary).

The evidence beside it. Sharp's upright and kneeling positions fit the trials (Gupta 2017, via MA-01, section 1.10). Siegemund's internal version is the one procedure that can make vaginal birth possible where otherwise only a caesarean can. It is grade B on the historical record and a skill for a few expert hands. Ash on the cord and withholding colostrum are grade X (section 1.10). Harmful birth practice was never an African or Asian peculiarity. It is where any attendant without germ theory or counted outcomes drifts.

1.5 The African birth attendant

On its own terms. In the Upper West Region of Ghana, in Nadowli-Kaleo and Daffiama-Bussie-Issa districts, Sumankuuro and colleagues interviewed 17 TBAs and 26 health workers in Dagaare between October 2020 and June 2021 (Sumankuuro 2022, full text read). The Dagaaba attendants call their uterine medicines *mansugo*, and their logic too is hot and cold. Cold mansugo is given in pregnancy to hold a threatened pregnancy or settle a breech.

Hot mansugo is given in labour, by mouth, rubbed on the abdomen or put into the vagina, to make a slow labour fast. One TBA said labour moves very fast once the hot medicine is drunk. One source is the mistletoe on the dawadawa tree (*Parkia biglobosa*). The article names it *Viscum album*, the European species, but West African tree mistletoes are more likely *Tapinanthus*, so the plant is uncertain [VERIFY]. Fees in Ghana and Malawi were not found [VERIFY, gap].

The evidence beside it. Local health workers named rupture, preterm birth, stillbirth and asphyxia, and one TBA described a death from rupture after a previous caesarean (Sumankuuro 2022). At a Ghanaian regional hospital, over two years and 5,085 deliveries, 41 uteri ruptured (1 in 124). A herbal concoction had been given in 24 (58.5%). Four mothers (9.8%) and 34 babies (82.9%) died (Fofie and Baffoe 2010, abstract read). This is the unconfirmed series in SY-01, now traced to its source. In Durban, herb users had heavy meconium in 55.6% against 15%, and in Mchinji, Malawi, among 8,219 births, labour-hastening *mwanamphepo* carried adjusted odds of 1.28 for maternal complications and 1.22 for neonatal death or illness (Mabina 1997 and Zamawe 2018, via TR-07). Hot mansugo in labour is grade X.

What states did. Ghana barred TBAs from conducting deliveries in 2000 (Sumankuuro 2022). Malawi banned them in 2007, and President Bingu wa Mutharika lifted the ban in 2010. Maternal mortality fell from 807 to 510 per 100,000 over those years, but the reporting does not attribute this to the ban, and TBAs kept working out of sight (IRIN 2010). A ban moves births only if there is somewhere else to go. Otherwise it drives the attendant underground, where no one can train, supply or count her. After the Fall there will be nowhere else.

1.6 Restricted knowledge

Parts of birth knowledge in many peoples are held under obligation: prayers, songs, dream instruction, initiation teaching and the ritual handling of the placenta and cord. SY-04 places these in category 4, to be named as existing and held by their custodians, never described or hinted at. Three cases appear in the sources read. The comadronas themselves call their knowledge and ritual sacred (Walsh 2006). At Galiwin'ku in north-east Arnhem Land, Yolŋu women, with Elaine Ḻäwurrpa Maypilama, a senior knowledge holder, and Dorothy Yuŋgirrŋa Bukulatjpi and Evelyn Djota Bukulatjpi of the Yalu Aboriginal Corporation, train *djäkamirr*, Yolŋu caretakers of birth, with a Yolŋu knowledge curriculum that the published article does not set out (Ireland 2022). In Sierra Leone the women's society Sande or Bondo has a healing role, but I could not confirm whether its knowledge touches midwifery [VERIFY], and its teaching is initiated, so nothing more is said. The evidence does not reach the restricted content and should not try to. What can be tested is what the holders choose to share, and the outcomes.

1.7 The training trials

History. The first recorded TBA training was by a missionary midwife, Miss M.E. Wolfe, in Sudan in 1921. WHO endorsed training at Alma-Ata in 1978. Courses lasted from several days to several months, and few covered complications (Sibley and Sipe 2006, full text read).

Larkana, Pakistan. Jokhio, Winter and Cheng randomised seven *talukas* of Larkana, Sindh, three to intervention. Medical staff trained the TBAs, who got disposable kits, Lady Health Workers linked them to the health system, and obstetric teams held outreach clinics. Among 10,114 intervention women (84.3% of those eligible) and 9,443 controls (78.7%), perinatal death fell (odds ratio 0.70, 0.59 to 0.82) and maternal death fell non-significantly (0.74, 0.45 to 1.23) (Jokhio 2005, abstract only). Perinatal mortality was about 85 against 120 per 1,000. Haemorrhage after 28 weeks fell (0.6) and infection around birth fell sharply (0.2). Labour over 18 hours was somewhat commoner (1.3) and referral for emergency care rose (1.5). Trained TBAs gave antenatal care to 90.8% of intervention women, the obstetric teams saw only 16.2%, and home births stayed at 81 to 83% (Guttmacher digest 2005). The training's length is not stated in the sources I could read [VERIFY, gap].

Lufwanyama, Zambia. Gill and colleagues randomised 127 TBAs, 60 to intervention and 67 to control, and fol-

lowed 3,497 infants to November 2008 (Gill 2011, full text read). All TBAs had already been trained in clean delivery and basic newborn care, including mouth-to-mouth breathing, and used clean kits. The intervention TBAs attended two one-week workshops, in June and August 2006, on an adapted resuscitation sequence: dry the baby at once, wrap in a second dry blanket, clear mouth and nose with a soft bulb, position the airway, assess breathing, and breathe with bag and mask if needed. They also learned the signs of newborn infection, and on finding them gave one dose of oral amoxicillin and took mother and baby to the health centre. Both arms had refreshers every three to four months with one-to-one skills checks, with travel, food and lodging paid. Neonatal mortality by day 28 fell by 45% (relative risk 0.55, 0.33 to 0.90). First-day deaths were 7.8 against 19.9 per 1,000, and asphyxia deaths fell most (0.37). Stillbirths and infection deaths did not change. The authors judged resuscitation the effective part, and cited another Zambian study in which the skills were lost within six months.

First Breath, six countries. Carlo and colleagues trained birth attendants, many traditional, in Argentina, the Democratic Republic of Congo, Guatemala, India, Pakistan and Zambia. Essential newborn care training, assessed before and after in 57,643 infants, did not change 7-day neonatal death (relative risk 0.99) but cut stillbirth (0.69, 0.54 to 0.88). Resuscitation training, randomised in clusters with 62,366 infants, did not reduce early neonatal death (Carlo 2010, abstract only). Gill's team noted that First Breath's trained and control attendants used bag-mask breathing at similar rates. Training without equipment and practice changes nothing.

The reviews. The Cochrane review by Sibley, Sipe and Barry found six studies, more than 1,345 TBAs and about 57,000 births. Larkana is the only comparison of trained with untrained TBAs: perinatal death 0.70, stillbirth 0.69, neonatal death 0.71, maternal death 0.74 (0.45 to 1.22). Additional training gave perinatal death 0.79 (0.61 to 1.02), neonatal death 22.8 against 40.2 per 1,000 in Lufwanyama (0.54), and no change in stillbirth (0.99). The authors called the results promising but insufficient (Sibley 2012, summary and abstract read). The Cochrane Library lists it as republished in May 2022, but its searches end in June 2012. SY-01 cites it as "Sibley, Sipe and Barry 2022" (THRIVING library, SY-01). It is the 2012 review, with evidence fourteen years old.

Wilson and colleagues pooled strategies that included training and supporting TBAs: six cluster trials with 138,549 births and seven non-randomised studies with 72,225. In the trials perinatal death fell (relative risk 0.76, 0.64 to 0.88, one death prevented per 35 births) and neonatal death fell (0.79, one per 98). Maternal death did not fall significantly in either the trials (0.79, 0.53 to 1.05) or the other studies (0.80) (Wilson 2011, abstract only).

What it means. Training the TBA, with kits, refreshers, equipment and somewhere to send the hard cases, saved babies, about one perinatal death per 35 births. It did not measurably save mothers. Every trial bundled the training with something the Fall removes: the factory kit, amoxicillin, the bag and mask, the Lady Health Worker and the health centre. What remains is the training and the parts of it that need no supply chain: clean hands, a clean blade, dry and warm the baby, clear the airway, breathe for the baby, and start the journey early.

1.8 Women's groups and home visits: why they did more

Makwanpur, Nepal. Manandhar and colleagues randomised 12 pairs of areas of about 7,000 people. In intervention areas a local woman facilitator ran nine women's groups a month, which met to identify the problems of pregnancy and birth in their community, choose strategies and act. Of 28,931 women, 8% joined. Neonatal mortality was 26.2 against 36.9 per 1,000 (odds ratio 0.70, 0.53 to 0.94). There were two maternal deaths against eleven, a ratio of 69 against 341 per 100,000 (0.22, 0.05 to 0.90). Antenatal care, trained attendance and hygienic care rose (Manandhar 2004, abstract only).

Jharkhand and Orissa. The Ekjut trial used the same method in 36 clusters of 228,186 people, about 13 groups per cluster and 19,030 births from 2005 to 2008. Neonatal mortality fell overall (0.68) and by 45% in years two and three (0.55). In the intervention arm it fell from 55.6 to 37.1 to 36.3 per 1,000, while in the control arm it rose from 53.4 to 59.6 to 64.3. Maternal depression also fell (Tripathy 2010, abstract only).

Shivgarh, Uttar Pradesh. Kumar and colleagues randomised 39 units of 104,123 people. Community health

workers held group meetings and made two visits before and two after birth, aimed at the home practices that kill newborns. Neonatal mortality fell by more than half (relative risk 0.46, 0.35 to 0.60). Care-seeking hardly changed. What changed was birth preparation, hygiene, warmth, cord care, skin care and breastfeeding (Kumar 2008, abstract only).

Gadchiroli. Home-based newborn care cut neonatal mortality by 62%, and home visit programmes as a class gave a relative risk of 0.62 (Bang 1999, Gogia and Sachdev 2010, via FO-04).

The meta-analysis. Prost and colleagues pooled seven trials of women's groups using participatory learning and action, with 119,428 births. Maternal death fell (odds ratio 0.63, 0.32 to 0.94), neonatal death fell (0.77, 0.65 to 0.90), and stillbirth did not change significantly (0.91). Where at least 30% of pregnant women took part, maternal death was 0.45 and neonatal death 0.67, and the effect rose with coverage (Prost 2013, abstract only).

Why more than training the TBA. This is inference [VERIFY]. The groups and visits reached every pregnant woman and her family, not only those the attendant saw. They changed the household's behaviour, where most newborn deaths are decided: drying, warmth, the first feed and the cord. They shortened the first delay, because a group with a birth plan and a transport fund decides faster. And Shivgarh halved deaths while care-seeking barely changed, so the gain did not depend on the health system. This matters most for the Fall. Women's groups need a facilitator, a meeting place and a method, not a supply chain.

1.9 The reversal, and what the Fall does to it

From Alma-Ata in 1978 to about 1990, training TBAs was the main strategy for safer birth in poor countries. In 1992 WHO, UNICEF and UNFPA issued a joint statement on integrating TBAs into health services, and by 1997 the Safe Motherhood movement had moved to a skilled attendant at every birth (Sibley and Sipe 2006). The 2004 statement by WHO, ICM and FIGO says that "training of TBAs has not contributed to reduction of maternal mortality". It argues that past programmes failed because TBAs were not linked to a working health system, that TBA-only strategies led governments to delay building skilled attendance, and that the TBA's best role is to advocate for skilled care, with Malaysia as the model. It defines the skilled attendant as an accredited professional able to manage normal birth and to identify, manage or refer complications (WHO, ICM and FIGO 2004). Bergström and Goodburn's 2001 chapter making the same case could not be read, and reaches me only through Sibley and Sipe's citation.

The reversal had two roots. One was real. Mothers die mainly of haemorrhage, obstructed labour, eclampsia and sepsis, and the decisive treatments are uterotonics, operative delivery, caesarean section, transfusion, magnesium and antibiotics. A TBA can do none of the operations and few of the rest, and no trial showed TBA training cutting maternal death. The other root was professional. Midwives, obstetricians and ministries wanted births in their institutions. Chawla's point that dais were scapegoated, and the comadronas' account of humiliation at the hospital door, are the other side of that history. Both roots are true.

What the Fall does. The 2004 argument assumes a health system to refer to. After the Fall there is none, and the third delay becomes total for a rupture or an obstruction that needs a caesarean (MA-01). The skilled attendant of WHO's definition will not exist. The woman who can be trained, supplied with soap, cloth and a clean blade, taught to dry and breathe for a baby, and kept in practice is the best attendant the village will have. She becomes the skilled attendant. The evidence sets honest expectations: a trained village midwife should cut newborn deaths by a quarter to a half, and will cut maternal deaths only where she prevents sepsis and bleeding, keeps herbs and fists off the uterus, and starts the journey early to whoever in the district can do more (MA-02).

Today against after the Fall. Today the 2004 policy is right: TBAs linked to, and over time replaced by, midwives within reach of a caesarean. After the Fall the right policy is what the trials support without the hospital: a trained village midwife, a women's group in every village, newborn home visits, and one person in the district with the advanced skills of MA-01 and MA-02.

1.10 Practices that help and practices that kill

Practices that help. Each is cheap and fits most traditions.

- *Upright and chosen positions* (A). Assisted births fell (relative risk 0.75) at some cost in blood loss over 500 mL (1.48) (Gupta 2017, via MA-01). Found in Sharp, the partera's rebozo and the birth stool.
- *Skin-to-skin contact at once* (A). In 46 trials with 3,850 pairs it raised breastfeeding at one to four months (relative risk 1.24), the baby's blood sugar by about 10 mg/dL [VERIFY: units] and its temperature by about 0.3°C (Moore 2016, abstract only).
- *Waiting before cutting the cord* (A). At least a minute gave 101 g more birthweight and 1.49 g/dL more haemoglobin without more haemorrhage (McDonald 2013, via MA-01).
- *Breastfeeding in the first hour, colostrum included* (B). In 10,947 Ghanaian infants, starting after day one carried 2.4 times the risk of neonatal death, and other milk, fluids or solids before the breast about four times. The authors estimated that first-hour breastfeeding could prevent 22% of neonatal deaths (Edmond 2006, abstract only). The NEOVITA meta-analysis of 136,047 infants found 33% higher risk when breastfeeding started at 2 to 23 hours and 2.19 times at 24 hours or later (Smith 2017, abstract only). These are cohorts, so grade B.
- *Continuous company* (A, Bohren 2017, via MA-01).
- *Rubbing the belly after the placenta* (A as uterine massage, MA-02). Cherokee midwives warmed a hand over charcoal to do it (TR-08).

Practices that kill, all grade X.

- *Fundal pressure.* In nine trials, manual pressure in five trials with 3,057 women did not change spontaneous birth (relative risk 0.96, very low quality) and was linked to more cervical tears (4.90), and an inflatable belt raised severe perineal tears (15.69) (Hofmeyr 2017, abstract only). WHO 2018 recommends against it (MA-01). On a labour blocked by the pelvis it may rupture the uterus [VERIFY: inference].
- *Herbal uterotonics in labour.* Zoapatle, hot mansugo and mwanamphepo (sections 1.3 and 1.5), raw ergot (MA-02, ME-07), blue cohosh and castor oil. A uterine stimulant cannot tell a weak uterus from a baby who cannot pass, and in the second case it drives the uterus to tear.
- *Blue cohosh* (*Caulophyllum thalictroides*, root and rhizome). A newborn whose mother took it to start labour had a heart attack, heart failure and shock (Jones and Lawson 1998, search summary only). A second report linked it to perinatal stroke, though the tea also held a cocaine metabolite (Finkel and Zarlengo 2004, search summary only). About 64% of American midwives were reported to have used it (secondary [VERIFY]). Do not confuse it with black cohosh (*Actaea racemosa*), a different plant.
- *Castor oil* (*Ricinus communis*, seed oil). In three trials with 233 women, every woman who took it felt nauseous (relative risk 59.92), with no clear change in caesarean (2.04, 0.92 to 4.55), meconium or Apgar, and no mortality data (Kelly 2013). The seed itself contains ricin and must never be eaten [VERIFY: not from a source read here]. I found no death from castor oil in labour, so the brief's claim that it has killed is not confirmed here [VERIFY, gap]. It is graded X as shown ineffective.
- *Anything on the cord.* Ghee on the cord was a risk factor for neonatal tetanus in Pakistan, and any substance carried an adjusted odds ratio of 5.1 (2.7 to 9.7) in Karachi (Traverso 1991 and Raza 2004, via SY-01). Untreated neonatal tetanus kills close to 100% (IN-01), and even with hospital care but no ventilators 38% of 171 died at Jimma, Ethiopia (FO-02). Ash on the cord was English practice in the 1600s (Read 2014). Traditional cord care is a tetanus story. Two doses of tetanus toxoid in pregnancy cut neonatal tetanus deaths by about 94% (Blencowe 2010, via IN-01), and the disease will return as girls born after the Fall become mothers (IN-01).
- *An unclean cut.* An unboiled, shared or improvised blade. Grade X on the tetanus record and on the 19% lower neonatal mortality with attendant handwashing (Rhee 2008, via MA-01).
- *Discarding colostrum and prelacteal feeds.* About four times the risk of neonatal death (Edmond 2006), and practised in early modern England (Read 2014) and North India (Kumar 2008).
- *Prolonged pushing on a stalled labour.* The limits of 3 hours in a first birth and 2 in later ones, with review after

1 hour of good pushing, are in MA-01. A labour that does not move despite good contractions is obstruction until proved otherwise, and more pushing, pressure and herbs lead to rupture, fistula and a dead baby (TR-07).

1.11 The three delays and the clean kit

The three delays. Thaddeus and Maine, for the Prevention of Maternal Mortality Program run by Columbia University with teams in Ghana, Nigeria and Sierra Leone, grouped the causes of maternal death into delay in deciding to seek care, delay in reaching a facility and delay in receiving adequate care there, and argued that most obstetric deaths are preventable by prompt, adequate treatment (Thaddeus and Maine 1994, abstract only). The brief asks for the delays to be quantified. The abstract gives no share of deaths for each delay, and I found no source read that does [VERIFY, gap]. The time windows are in MA-01 and MA-02: haemorrhage kills within hours, obstruction over a day or two. After the Fall the village controls the first delay wholly and the second partly, through a birth plan, a cart and a decision made when progress first slows. The district sets the third.

The clean kit. PATH defines five essentials: soap for the attendant's hands and the mother's perineum, a plastic sheet about one metre square, clean string for the cord, usually two pieces, a clean razor blade, and pictorial instructions. Gloves are added where HIV and hepatitis are common. The kit rests on WHO's six cleans: clean hands, clean perineum, nothing unclean put into the vagina, a clean delivery surface, a clean cord-cutting instrument and clean cord care, with nothing applied to the cut or the stump, which is left uncovered to dry (PATH 2006, full text read). In Mwanza, Tanzania, among 3,262 women, babies whose mothers used a kit were 13 times less likely to have cord infection and the mothers three times less likely to have puerperal sepsis, after adjustment for place of birth, labour length, cord substances and bathing (PATH 2006, reporting Winani 2005, not read [VERIFY]). Hundley's systematic review found kit packages associated with fewer newborn deaths (three studies), less cord infection (four) and less puerperal sepsis (three), but could not separate the kit from the teaching around it (Hundley 2012, abstract summary only). MA-01's Protocol 2 gives the full household and attendant kit. Protocol 4 below shows how a village makes the PATH kit without a factory.

2. Evidence grades

Practice	Tradition says	Record shows	Grade
TBA training with kit and link to care	Safer birth	Perinatal death 0.70, maternal not shown (Jokhio 2005)	A for babies, none shown for mothers
Resuscitation, amoxicillin and referral	Saves the baby who does not breathe	Neonatal death 0.55 (Gill 2011), null in First Breath (Carlo 2010)	A, conflicting
Women's groups	Not traditional	Neonatal 0.77, maternal 0.63 (Prost 2013)	A
Newborn home visits	Not traditional	Neonatal 0.38 to 0.46 (Bang 1999, Kumar 2008)	A
Clean kit with teaching	Not traditional	Fewer deaths, sepsis, cord infection (Hundley 2012)	B, inseparable from teaching
Upright and kneeling birth	Easier birth	Assisted birth 0.75, more blood loss (MA-01)	A
Skin-to-skin	Keeps baby warm	Breastfeeding 1.24, warmer (Moore 2016)	A
Waiting before cutting the cord	Placenta first	+101 g, +1.49 g/dL (MA-01)	A

Practice	Tradition says	Record shows	Grade
Breastfeeding in the first hour	Varies	2.4 times death if after day 1 (Edmond 2006)	B
Rebozo, sobada for comfort	Opens, settles	No study	D
Sobada to turn a breech	Settles the baby	No study	D, harm risk
Cierre and temazcal	Close the body, keep heat	No study	D
Siegemund's internal version	Turns the crosswise child	Her series, about 6,200 births	B historical, expert only
Zoapatle in labour	Brings contractions	8 of 8 newborns depressed (Montoya-Cabrera 1998)	X
Zoapatle after the placenta	Stops bleeding	No trial	D
Hot mansugo, mwanamphepo	Hastens labour	Herbs in 24 of 41 ruptures (Fofie 2010), aOR 1.22 (TR-07)	X
Blue cohosh, castor oil	Starts labour	Neonatal heart failure, nausea, no benefit	X
Fundal pressure	Pushes baby out	No benefit, more tears (Hofmeyr 2017)	X
Ash, dung, ghee, oil on cord	Heals cord	Tetanus aOR 5.1 (SY-01)	X
Discarding colostrum, prelacteal feeds	Colostrum is bad	About 4 times death (Edmond 2006)	X
Banning TBAs with no alternative	State policy	Practice went unseen (IRIN 2010)	D, likely harmful

I agree with TR-07's grade A for TBA training in newborn survival, with the qualification from First Breath that resuscitation training works only with equipment, practice and refreshers (THRIVING library, TR-07).

3. Means ledger

For the whole system of a trained village midwife, women's groups and newborn visits.

Rung	What can be done	What it changes
Hands and knowledge	Chosen positions, company, no fundal pressure, no herbs in labour, dry and warm the baby, skin to skin, breastfeed in the first hour, wait before cutting the cord, nothing on the cord, mouth-to-mouth breathing, time limits, a birth plan, a women's group	Most of the Shivgarh gain, which came from household behaviour. Prevents cord-substance tetanus and cold deaths
Hearth	Soap, boiled water, boiled string, a new or boiled blade, boiled cloths, a clean sheet, a warm room, food and drink in labour	The six cleans. Less cord infection and sepsis (PATH 2006, Hundley 2012)

Rung	What can be done	What it changes
Garden and still	Alcohol for hands and blade, a soft bulb, a hanging scale, wax-sealed kit packets, a sand-glass for counting breaths	Better resuscitation, weighed babies, a timed second stage
Village dispensary (300)	A trained midwife and a second woman at every birth, a register, a salvaged bag and mask, stored misoprostol (FO-04, MA-02), toxoid while it lasts, newborn visits on days 1, 3 and 7	The Lufwanyama and Gadchiroli gains, a quarter to a half fewer newborn deaths, some bleeding deaths prevented
District infirmary (3,000)	An advanced midwife, stored uterotonics and antibiotics, manual removal of the placenta, perhaps internal version, refreshers every 3 to 4 months	Some sepsis, retained placenta and haemorrhage deaths prevented. Skills kept from fading
Hospital before the Fall	Caesarean, transfusion, magnesium, operative delivery, newborn intensive care	The maternal deaths TBA training never prevented: obstruction, rupture, eclampsia, massive bleeding

4. Harm test

Practice	How it harms	Who must never receive it	Signs it is going wrong	What to do	Cases
Herbal uterotonics in labour (zoapatle, mansugo, mwanamphepo, blue cohosh, raw ergot)	Contractions too strong or unbroken, baby starved of oxygen, uterus tears	Every woman in labour, above all after a caesarean, in a stalled labour, with a big baby or crosswise lie	No ease between contractions, slow baby's heart, green waters, sudden sharp pain then quiet, bleeding, shock	Stop the herb, left side, empty the bladder, call the most skilled hands, resuscitate the baby (MA-01, MA-02)	Tlaxiaco 1998, Ghana 2010, Durban 1997, Mchinji 2018
Misidentified plant	Wrong species or strength	Everyone	Unexpected effects	Do not give	20 Montanoa species, the uncertain mistletoe
Fundal pressure	Cervical and perineal tears, perhaps rupture	Every woman	Bleeding, pain, no descent	Stop, change position, apply MA-01 limits	Hofmeyr 2017
Substance on the cord, unclean blade	Tetanus, sepsis	Every newborn	Days 3 to 14: stops sucking, stiff jaw, spasms. Red, smelly cord	Keep warm, cup-feed expressed milk, refer, quiet dark room (IN-01). Toxoid for the next mothers	Pakistan, England 1600s

Practice	How it harms	Who must never receive it	Signs it is going wrong	What to do	Cases
Discarded colostrum, prelacteal feeds	Infection, cold, low sugar	Every newborn	Weak suck, cold, sleepy, few wet cloths	To the breast now, skin to skin, cup-feed colostrum	Ghana 2006
Pushing on a stalled labour	Rupture, fistula, dead baby, sepsis	Every woman	No descent after 1 hour of good pushing, swelling, dark urine, fever	Stop pushing, left side, fluids, call the district (MA-01)	TR-07 fistula series
Turning by sobada	Placental separation, cord problems	Women in labour, after bleeding, with a scar [VERIFY: inference]	Bleeding, pain, slowing heart	Stop at once	None found
Temazcal after birth	Heat collapse	Feverish, bleeding or faint women	Dizziness, fast pulse	Out, cool, fluids (TR-08)	None found

5. Red flags

These mean the mother or baby will probably die or be disabled without what the village cannot give. Thresholds are in MA-01 and MA-02.

- **Labour that does not progress:** active labour beyond 12 hours in a first birth or 10 in later ones, or no descent after 1 hour of good pushing (MA-01). Obstruction needs a caesarean.
- **Constant pain, or contractions that stop suddenly with shock:** possible rupture, especially after a herb or fundal pressure.
- **Bleeding that soaks a cloth in minutes**, before or after birth (MA-02).
- **Fits, severe headache or swelling** with high blood pressure (MA-01).
- **Fever and foul discharge after birth:** sepsis, which needs antibiotics.
- **A baby who does not breathe** after drying, warming and clearing the airway, or stays blue and floppy after breathing for it.
- **A newborn who stops sucking, with a stiff jaw or spasms:** tetanus, close to fatal without ventilation (IN-01).
- **A crosswise baby in labour:** without expert internal version or a caesarean, neither mother nor baby is likely to survive [VERIFY: inference, see MA-01].

What to do anyway. Send for the most skilled person in the district at the first sign. Keep the woman on her left side, warm, drinking if awake, bladder empty. Keep the baby skin to skin and fed. Do not give herbs or press on the uterus. Write down the times.

Honest comfort. Some of these women and babies will die whatever the midwife does. Every midwife in this report lived with that, and what she could give was presence, warmth, relief of thirst and fear, and the knowledge that the woman was not alone. After a death the village should review what happened with her, not to blame her, but to learn what could have been done earlier. Blame drives attendants out of sight, as Malawi's ban did.

6. The case against

Against TBA training. WHO, ICM and FIGO in 2004, and Bergström and Goodburn in 2001, argued that no trial shows TBA training cutting maternal death and that money spent on it delayed the midwives and hospitals that do. The trials bear them out on mothers: Wilson's maternal estimates of 0.79 and 0.80 are not significant, and Jokhio's 0.74 crossed 1. Sibley, Sipe and Barry, sympathetic to TBAs, judged their own evidence insufficient. Carlo's First Breath found resuscitation training in six countries did not cut early neonatal death, and Gill's team reported skills fading within six months. On this view the book should put its effort into a few highly trained district midwives rather than many village ones.

Against women's groups. Prost pooled seven trials of one method, largely from one research network, and the effect depended on coverage. The Makwanpur maternal result rests on two deaths against eleven. Effects may shrink when a stretched authority, not a research team, runs the groups [VERIFY: no scale-up evaluation read].

Against the tradition. The Ghana ruptures, the Tlaxiaco babies, cord tetanus and denied colostrum are the attendants' own practices, and the romance of natural birth ignores them.

Against the critics. Obstetric contempt ignores that the trials saved one baby per 35 to 98 births, that Shivgarh halved newborn deaths without a hospital, and that comadronas held back from referral because of how hospitals treated them (Kühlen 2017).

The balance. The reversal was right for a world with hospitals and is wrong for one without. The traditions hold some of the best practices known (upright birth, company, warmth, patience) and some of the worst (herbs in labour, dung on the cord, discarded colostrum). What protects women is a midwife who keeps the first, drops the second without being shamed, learns the few skills the trials showed save babies, and works beside a women's group that changes what households do.

7. 10-line summary

1. The traditional midwife is a called or inherited figure in most cultures, and after the Fall she will attend most births.
2. Training TBAs, with kits and links to care, cut perinatal death by about 30% in Larkana (odds ratio 0.70).
3. Adding resuscitation, amoxicillin and referral cut neonatal death by 45% in Zambia, but training without equipment and practice did nothing in First Breath.
4. No trial showed TBA training cutting maternal death.
5. Women's groups cut neonatal death by about a quarter and maternal death by about a third, more when 30% of pregnant women took part.
6. Home visits and behaviour change halved newborn deaths in Gadchiroli and Shivgarh, largely without the health system.
7. Herbal uterotonics in labour (zoapatle, mansugo, blue cohosh, ergot) are grade X, with ruptures and depressed newborns on record.
8. Anything on the cord, an unclean cut and discarded colostrum kill newborns, and Europe did all three.
9. A clean kit is soap, a sheet, two clean strings, a clean blade and a picture card, built on the six cleans.
10. After the Fall the TBA is the skilled attendant, and her training should follow what the trials showed, in order.

8. Open questions

- What does TBA training achieve with no kits, drugs or referral? No trial isolates it.
- How much of the women's-group effect survives where no care exists to refer to? Shivgarh suggests most.
- Does zoapatle or another plant uterotonic after the placenta prevent bleeding as well as massage or misoprostol? Untested.
- How long do resuscitation skills last with refreshers every 3 to 4 months?

- What share of maternal deaths falls in each of the three delays where there is no hospital? Not found.
- Is the mansugo mistletoe *Viscum* or *Tapinanthus*, and does its strength vary between batches as zoapatle's does?
- Can the six cleans alone cut maternal sepsis deaths? Larkana's infection odds ratio of 0.2 suggests so, but maternal deaths did not change significantly.

9. Sources to read in full

1. Jokhio, Winter and Cheng 2005, NEJM, for the training content.
2. Gill et al. 2011, BMJ, with its illustrated resuscitation protocol.
3. Prost et al. 2013 and Manandhar et al. 2004, Lancet, for the women's group cycle.
4. Kumar et al. 2008, Lancet, for the behaviour-change content.
5. Sibley, Sipe and Barry 2012, Cochrane CD005460, and Sibley and Sipe 2006.
6. Bergström and Goodburn 2001, in De Brouwere and Van Lerberghe (eds), *Safe Motherhood Strategies*, ITG-Press, Antwerp. Not read.
7. Sharp 1671, *The Midwives Book* (Hobby edition, Oxford University Press 1999). Not read.
8. Siegemund 1690, *The Court Midwife*, translated by Lynne Tatlock (University of Chicago Press 2005). Not read.
9. Botteri and Bochar Pizarro 2019, and Jordan 1978, *Birth in Four Cultures*.
10. Jeffery, Jeffery and Lyon 1989, *Labour Pains and Labour Power*, for the dai without romance.

At the bedside after the Fall

Household. A birth plan, a clean kit made at the hearth (Protocol 4), a woman who will stay, and the stop list of Protocol 2: nothing on the cord, no herbs to hurry labour, no pressing on the belly, the baby on the mother's chest at once and at the breast in the first hour. First failure to expect: a grandmother who insists on the herb or the ash, and a mother who cannot refuse her. The women's group, which works on the whole household, is the answer.

Village of 300. About 9 births a year at a birth rate of 30 per 1,000 [VERIFY: inference]. One trained midwife and one assistant, chosen by FO-04's Protocol A, trained by Protocol 1, paid in kind and honoured in public. A monthly women's group with every pregnant woman and her mother-in-law invited (Protocol 3). Newborn visits on days 1, 3 and 7 (FO-04 Protocol D). A births and deaths register. Needs: the midwife's kit (MA-01 Protocol 2), a salvaged bag and mask if possible, a bulb, a hanging scale, and any stored misoprostol and toxoid. First failure to expect: with so few births, the midwife loses her resuscitation skills between real cases, as the Zambian attendants did within six months. The answer is monthly practice on a doll and a district refresher every 3 to 4 months.

District of 3,000. About 90 births a year [VERIFY: inference]. One advanced midwife, ideally hospital-trained before the Fall or apprenticed to someone who was, holding the skills of MA-02 and if possible internal version and manual removal of the placenta. She trains, refreshes, keeps the drugs and is called early. Needs: a room, a cart and messengers that reach every village within hours, stored uterotonics and antibiotics, and a district register. First failure to expect: the village midwife calls too late, from pride or because the journey is hard, and the advanced midwife arrives to a ruptured uterus. The answer is a rule that an early call is never blamed.

Protocols

These build on MA-01 (normal birth and kit), MA-02 (bleeding) and FO-04 (choosing the lay healer, newborn visits, misoprostol).

Protocol 1. Training a village midwife: the curriculum in order

Format, following Lufwanyama: two blocks of 5 to 7 days about 8 weeks apart, then refreshers every 3 to 4 months with a one-to-one skills check (Gill 2011). Feed and house the trainees and cover their travel. Teach by doing, on a

cloth doll. Ask what she does before saying what to change.

Block 1.

- ☐ Day 1, morning. Each trainee describes a normal birth in her own words. Record nothing restricted (section 1.6).
- ☐ Day 1, afternoon. The six cleans (section 1.11). Wash hands with soap for 40 to 60 seconds, the WHO time (THRIVING library, HY-01), nails short. Boil string and any reused blade for at least 20 minutes (THRIVING library, HY-10). Boiling does not reliably kill tetanus spores (THRIVING library, WO-03), so a new blade is better and nothing goes on the cord. Each trainee makes a kit (Protocol 4).
- ☐ Day 2. The stop list (Protocol 2), each item with its case: Tlaxiaco, the Ghana ruptures, the tetanus baby. Present each as something good women did because they did not know, including European midwives with ash on the cord.
- ☐ Day 3. Normal labour by MA-01 Protocol 1. Chosen positions, company, food and drink. By heart: 12 hours of active labour in a first birth, 10 in later ones, and 1 hour of good pushing without descent means call help (MA-01).
- ☐ Day 4. The first minute, in Gill's order. Dry at once with a warm cloth. Wrap in a second dry cloth or put skin to skin. Clear mouth then nose with a bulb or clean cloth, no deeper than 10 cm (MA-01). Head slightly back. Look for breathing. If none, breathe for the baby with bag and mask or mouth over mouth and nose (MA-01). Practise on the doll until each trainee does it in order in under 1 minute [VERIFY: target, inference].
- ☐ Day 5. After the baby. Wait at least 1 minute, or until the cord stops pulsing, then two ties and cut between (MA-01). Nothing on the cord. Skin to skin. To the breast within the hour, colostrum first. The placenta and bleeding by MA-02 Protocol 1, misoprostol by FO-04 Protocol E if stock exists.
- ☐ Day 6. Red flags (section 5) and the birth plan. Each trainee makes a plan with a real family: who decides, who carries, which cart, which route, how long.

Block 2, about 8 weeks later.

- ☐ Review each birth attended since Block 1, without blame.
- ☐ Repeat the first minute on the doll until perfect.
- ☐ Newborn visits on days 1, 3 and 7 (FO-04 Protocol D). Count breaths for a full minute, 60 or more is fast.
- ☐ Signs of newborn infection. Refer with the baby. Newborn antibiotic doses belong to the antibiotic reports and are not given here.
- ☐ The women's group (Protocol 3). Each trainee co-leads one meeting.
- ☐ The register: every birth, every death, and the hour of every call to the district.

Refreshers, every 3 to 4 months, 1 to 2 days.

- ☐ Each midwife performs the first minute on the doll, watched one to one. Retrain any missed step.
- ☐ Review every death and near miss in the register.
- ☐ Restock kits.

Tolerance: a midwife with no birth and no doll practice for 3 months retrains before her next birth (Gill 2011, skills lost within 6 months).

Protocol 2. Keep and stop

Use at every birth and every women's group. Say it without contempt.

Keep.

- ☐ The woman chooses her position, upright or kneeling if she wishes.
- ☐ Women she trusts stay with her.

- ☐ Warmth, the rebozo for comfort, prayer and song as she and her family wish.
- ☐ Waiting for the cord to stop pulsing before tying.
- ☐ Rubbing the belly after the placenta is out (MA-02).
- ☐ The closing rituals after birth, so long as they keep no sick woman or baby from help.

Stop.

- ☐ No herb, root, oil or drink to start or hurry labour. No zoapatle, mansugo, mwanamphepo, blue cohosh, castor oil, rue or ergot before the placenta is out.
- ☐ No pressing, leaning or kneeling on the belly.
- ☐ No pushing beyond the MA-01 limits on a labour that does not move.
- ☐ Nothing on the cord: no ash, dung, mud, ghee, oil, powder or spit.
- ☐ No unboiled or shared blade.
- ☐ No discarding colostrum. No water, sugar water, honey, ghee or animal milk before the breast.
- ☐ No bath for the baby before 6 hours, better 24 (WHO 2018, via MA-01). Dry and wrap instead.
- ☐ No hand inside the vagina unless washed and necessary, and never to stretch the cervix (MA-01).

Protocol 3. The women's group cycle

Based on the participatory method of Makwanpur, Ekjut and Prost 2013. The exact sequence of meetings in those trials was not read [VERIFY].

- ☐ One facilitator per village, a local woman, trained with the midwife in Block 2.
- ☐ Meet monthly at a fixed time and place. Invite every pregnant woman, every woman with a baby under one, and their mothers-in-law.
- ☐ Aim to reach at least 3 in 10 pregnant women, the coverage at which the effect was largest (Prost 2013).
- ☐ Months 1 to 3: the group names the problems of birth in its own village, through stories of births and deaths. Use picture cards for those who cannot read.
- ☐ Months 4 to 6: the group chooses its strategies, such as birth plans, a transport fund, a stretcher, clean kits, and telling households about colostrum and the cord.
- ☐ Months 7 to 12: the group carries them out and reports at each meeting.
- ☐ At a year: count what happened from the register and begin again.
- ☐ Do not lecture. The facilitator asks and the group decides. Bring in the Protocol 2 list when the group raises a topic, as information, not orders.

Protocol 4. The clean kit at the hearth

From PATH 2006 and MA-01 Protocol 2. One per expected birth, made in the eighth month.

- ☐ 1 piece of soap, enough for two hand washes and the perineum.
- ☐ 1 sheet about 1 m by 1 m: oiled or waxed cloth, salvaged plastic, or a boiled and sun-dried cloth if nothing waterproof exists.
- ☐ 2 cotton strings about 15 cm long [VERIFY: length, as MA-01], boiled at least 20 minutes (HY-10), dried and wrapped.
- ☐ 1 new razor blade, or a small knife kept only for births and boiled at least 20 minutes just before use (HY-10). New is better, because boiling does not reliably kill tetanus spores (WO-03).
- ☐ 1 picture card of the six cleans and the stop list.
- ☐ Gloves or clean bags if available.
- ☐ Wrap all in boiled, dried cloth, sealed with wax or stitching. Keep dry and off the floor.
- ☐ Check at the ninth month. Re-boil any wet or opened kit.

Numbers to carry

1. **0.70.** Perinatal death with trained TBAs, kits and links to care in Larkana (Jokhio 2005).
2. **45%.** Fewer newborn deaths when TBAs learned resuscitation and referral in Zambia, with refreshers every 3 to 4 months (Gill 2011).
3. **6 months.** How long resuscitation skills last without practice (Gill 2011).
4. **30%.** The share of pregnant women a women's group must reach to cut newborn deaths by a third and maternal deaths by half (Prost 2013).
5. **1 hour.** Breastfeed within it. Starting after day one carries 2.4 times the risk of death, and other feeds first about 4 times (Edmond 2006).
6. **Nothing.** What goes on the cord. Any substance carried 5 times the odds of tetanus (SY-01), and untreated newborn tetanus kills almost all (IN-01).
7. **24 of 41.** Ruptured uteri in a Ghanaian hospital in which an herbal concoction had been given (Fofie and Baffoe 2010).
8. **1 minute.** The least wait before tying the cord (MA-01).
9. **12, 10 and 1.** Hours of active labour in a first and a later birth, and of pushing without descent, before calling the district (MA-01).
10. **Five things.** Soap, a sheet, two strings, a clean blade and a picture card (PATH 2006).

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