

WEB TABLE I Characteristics of Included Controlled Trials

	Study	Type of study	Intervention		Subjects	Result	Remarks
			Experimental	Control			
Studies with home visitation by community health workers with / without community mobilisation							
1	Jokhio 2005, Pakistan [8]	Cluster randomized trial	<p>TBAs training (3 days) with the use of picture cards containing advice on antepartum, intrapartum, and postpartum care</p> <ul style="list-style-type: none"> -how to conduct a clean delivery -use of the disposable delivery kit -when to refer women for emergency obstetrical care -care of the newborn. <p>TBAs asked to visit each woman at least three times during the pregnancy (at 3,6,9 months) to check for dangerous signs such as bleeding or eclampsia, and to encourage women with such signs to seek emergency obstetrical care.</p> <p>Lady Health Workers were trained to support the traditional attendants and record the data.</p>	<p>TBAs were not trained and did not receive delivery kits. Routine care was delivered by LHWs.</p>	<p>19,557 pregnant women 19,525 deliveries</p>	<p>Neonatal Mortality RR 0.71(0.62-0.83) Perinatal mortality RR 0.70(0.59-0.82) Still births RR 0.69(0.57-0.83)</p>	<p>Because of the difficulties in recruiting full-time female medical staff in primary care centers, obstetrical consultation was also provided by two teams of obstetricians from the public-sector tertiary care center in an adjoining city. These teams offered outreach clinics in two centers (one taluka hospital and one large, rural health center) in each of the three intervention talukas. The teams rotated their visits among the centers, holding eight outreach sessions in each center during the six-month intervention period.</p>

2	Baqui 2009, Bangladesh [9]	Cluster randomized trial	<p>In the <i>home-care arm</i>, female community health workers</p> <ul style="list-style-type: none"> -identified pregnant women -made two antenatal home visits to promote birth and newborn-care preparedness -made postnatal home visits to assess newborns on the first, third, and seventh days of birth -referred or treated sick neonates. <p>In the <i>community-care arm</i>,</p> <ul style="list-style-type: none"> -birth and newborn-care preparedness and careseeking from qualified providers were promoted solely through group sessions held by female and male community mobilisers. 	<p>Comparison arm received the usual health services provided by the government, non-government organizations and private providers. Refresher training for government workers was provided.</p>	58,588 pregnancies 46,444 live births	<p>Home-care arm Neonatal mortality RR 0.66(0.47-0.93) Community-care arm Neonatal mortality RR 0.95(0.69-1.31) Improvement in (at least one) antenatal check up from a trained provider, Iron and folate supplements intake, initiation of early and exclusive breast feeding, delayed bathing, cord care</p>	<p>Each community health worker was responsible for a population of about 4000, which was similar to the primary health-care worker to population ratio in the Bangladesh government health system, thus facilitating sustainability and scalability of the home-care service delivery approach. Too much population (18000) assigned to each Projahnmo community mobiliser.</p>
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3	Bhutta 2008, Pakistan [10]	quasi randomized trial	<p>LHWs in the interventional arm were given additional (6 days) training in</p> <ol style="list-style-type: none"> 1. Promotion of adequate maternal nutrition and rest 2. Early breastfeeding (within the first hour) and colostrum administration (avoidance of prelacteal feeds) 3. Thermoregulation 4. Home care of low-birth-weight infants 5. Treatment of neonatal pneumonia with oral trimethoprim-sulphamethoxazole 6. Recognizing sick newborns and danger signs requiring 7. Training in group counselling and communication strategies <p>LHWs made 7 home visits; twice during pregnancy, within 24 hours of birth, and on days 3, 7, 14 and 28 after delivery</p> <p>They were linked with Dais (who were given training for newborn resuscitation and immediate newborn care).</p> <p>Two community mobilizers assisted LHWs in identifying community volunteers, who helped set up community health committees for maternal and newborn care in their villages in close liaison with LHWs. These committees supported LHWs in conducting 3-monthly group education sessions in the intervention villages and helped to establish an emergency transport fund for mothers</p>	<p>LHWs received usual training in</p> <ol style="list-style-type: none"> 1. Promotion of antenatal care 2. Iron and folate use in pregnancy 3. Immediate newborn care 4. Cord care (cleaning and avoiding the use of traditional materials, such as ash and lead powder) 5. Promotion of exclusive breastfeeding 	2,789 pregnancies 5,542 live births	<p>Neonatal Mortality RR 0.72(0.56-0.91) Stillbirths RR 0.66(0.53-0.83) Improvement in institutional deliveries, initiation of early and exclusive breastfeeding, delayed bathing, cord care</p>	Number of LHWs per inhabitant was higher in intervention villages.
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4	Kumar 2008, India [11]	Cluster randomized trial	Preventive package of interventions for essential newborn care -birth preparedness -clean delivery and cord care -thermal care [including KMC] -breastfeeding promotion -danger sign recognition) -with or without use of a liquid crystal hypothermia indicator (ThermoSpot). Community health workers delivered the packages via -collective meetings and folk song group meetings -home visits during pregnancy (2) for birth preparedness and -2 visits in first week post-delivery for routine newborn care	Control arm received the usual services of governmental and NGOs in the area.	3,688 live births	Neonatal Mortality RR 0.51(0.36-0.73) Stillbirths RR 0.85(0.56-1.29) Improvements in birth preparedness, hygienic delivery, thermal care (including skin-to-skin care), umbilical cord care, skin care, and breastfeeding. There was little change in care-seeking.	The intervention that included the use of the thermoSpot did not seem to have an advantage over the package of essential newborn care. Significant community mobilization and behavior change communication
5	Bhutta 2010, Pakistan [26]	Cluster randomized trial	LHWs received additional training on -recognition of high risk pregnancies and referral -management of birth asphyxia, serious bacterial infections, LBW infants. TBAs received additional training on promotion of LHW attendance at births.	Trained LHWs in community mobilization by building support groups, promoting use of clean delivery kits, recognition of neonatal illness and referral for care; TBAs linked with LHWs and trained on promotion and use of clean delivery kits.	5,717 pregnancies 24,085 total births	Neonatal Mortality RR 0.85(0.76-0.96) Stillbirths RR 0.79(0.68-0.92) Perinatal Mortality RR 0.83(0.74-0.93) 24% increase in receiving at least one ANC observed 22% increase in birth attendance by skilled attendant	

6	Darmstadt 2010, Bangladesh [12]	Cluster randomized trial	<p>CHWs made 2 home visits scheduled at 12. 16 weeks and 32. 34 weeks to:</p> <ul style="list-style-type: none"> -Promote antenatal care (Making three antenatal care visits from a health centre or a satellite clinic, Receiving two doses of tetanus toxoid vaccine, iron-folic acid (IFA) supplementation, Eating extra food, --Care seeking for maternal danger signs -Promote birth planning -Distribute: clean delivery kit at the second antenatal visit for use by birth attendant -Promote newborn-care preparedness -Feeding colostrum to the newborn; initiating breastfeeding immediately after birth; practicing exclusive breastfeeding up to six months; and feeding the newborn frequently in the proper position day and night -Delaying bathing of the newborn for 72 hours -Umbilical area care -Monitoring the baby for signs of infection; and seeking care immediately from CHW or health facility if the newborn has any of the danger signs <p>Four home visits on postnatal days 0, 2, 5, and 8 to:</p> <ul style="list-style-type: none"> -Reinforce newborn care messages provided through prenatal visits -Provide counseling for routine breastfeeding and for breastfeeding difficulties -Surveillance of newborn illness: Identify sick neonates based on a clinical algorithm. -referral-level evaluation or, if referral fails, continue monitoring according to the clinical algorithm. 	Routine care	9,857 live births	Neonatal Mortality RR 0.87(0.68-1.12)	
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7	Baqui 2008, India [13]	quasi randomized trial	<p>Trained Village health workers (VHWs) to provide -health education to expectant and new mothers</p> <p>-support breast-feeding and -maintenance of body temperature in newborns</p> <p>-recognize danger signs in mothers and babies.</p> <p>-management of asphyxia, sepsis/pneumonia and low birth weight baby.</p> <p>The VHWs also coordinated closely with TBAs.</p>	Received standard government health and Integrated Child Development Services.	13,826 live births	No impact of intervention observed in differences of mortality	Improvement observed in institutional deliveries or conducted by skilled birth attendant, initiation of early breast feeding
8	Bang 2005, India [14-22]	Not randomised	<p>CHWs were trained to provide</p> <p>-Health education to mothers and grandmothers</p> <p>-Surveillance to identify pregnant women</p> <p>-Home visits during pregnancy (2) for birth preparedness</p> <p>-Home visits after birth (8 -11 visits in 28 days) for routine newborn care</p> <p>-Extra care for low birth infants</p> <p>-Care at birth, including newborn resuscitation</p> <p>-Treatment of sepsis (including injectable antibiotics)</p>	Received standard government health and Integrated Child Development Services.	5,921 live births	24% reduction in NMR (CI: 5- 38%)	
9	Kafatos 1991, Greece [28]	Cluster Randomised	<p>home visits on nutrition, general hygiene, breast feeding, and newborn care. Visits were scheduled every 2 weeks in the 1st 2 months of pregnancy and every month until the infant was 12 months old</p>	500 pregnant women		<p>The perinatal mortality was 31% for interventions vs. 41% for controls.</p> <p>5 neonatal deaths occurred among controls and interventions.</p> <p>significantly higher number of fetal deaths (28 weeks) for interventions.</p> <p>No discernible impact on breast feeding practices except for demand feeding</p>	

Studies with participatory learning and action cycle							
10	Azad 2010, Bangladesh [23]	Cluster randomized trial	Implemented a participatory learning and action cycle in which they identify and prioritize problems, then formulate strategies and lastly implement and monitor and finally evaluate the process; intervention group was again divided into two according to the whether TBAs trained for asphyxia with bag and mask or not.	Control group was not provided with participatory learning groups. Control and intervention clusters all received health services strengthening and basic training of traditional birth attendants.	36113 births	Neonatal Mortality RR 0.93 (0.80-1.09)	No improvements observed in service delivery and newborn care outcomes
11	Tripathy 2010, India [24]	Cluster randomized trial	Implemented a participatory learning and action cycle, through developing women's groups where they identify and prioritize maternal and newborn health problems in their community, collectively select relevant strategies to address those problems, implement the strategies, and evaluate the results. Every group met monthly for a total of 20 meetings. Facilitators coordinated an average of 13 meetings every month. 1 group for 468 population.	Health committees in control clusters were formed to give community a voice in the design and management of local health services.	19030 births	Neonatal Mortality RR 0.68(0.59-0.78) Stillbirths RR 1.05(0.86-1.28) Perinatal Mortality RR 0.79(0.69-0.91)	

12	Manandhar 2004, Nepal [25]	Cluster randomized trial	Female facilitator convened nine women's group meetings every month. The facilitator supported groups and through an action-learning cycle in which they identified local perinatal problems and formulated strategies to address them.	Routine care + improvements in equipment and training provided at all levels of the healthcare System.	28931 women of childbearing age 6714 pregnancies 6125 live births	Neonatal Mortality RR 0.70(0.53-0.94) Women in intervention clusters were more likely to have antenatal care, institutional delivery, trained birth attendance, and hygienic care than were controls.	
Other Studies							
13	Greenwood 1990, Gambia [27]	Not randomised	Government of Gambia implemented OHC service and trained TBAs regarding -clean deliveries at home -referrals for delivery and -promotion of antenatal and post care among mothers.	Non-PHC areas had routine delivery service outlets like health facilities and hospitals.	1,963 pregnancies 1,843 live births	33% reduction in neonatal deaths No impact on stillbirths	Increase in institutional deliveries by 56%

WEB TABLE II Community Health Worker Characteristics and Intervention

		Jokhi 2005 [8]	Baqui 2009 [9]	Bhutta 2008 [10]	Bhutta 2010 [26]	Darmst adt 2010 [12]	Baq ui 2008 [13]	Bang 2005 [14- 22]	Kumar 2008 [11]	Manandhar 2004 [25]	Tripathy 2010 [24]	Azad 2010 [23]	Greenwo od 1995
Community Health Worker Characteris tics	Level of education	10 years						5-10 years	12 years				Illiterate
	Remuneration	Unpai d		Transpor t cost	Transpor t cost				\$30-40/mo				
	Community health worker: population ratio	1:100 0- 5000	1 for 4000	1 for 1000	7.2-7.5 for 10000		1 for 4000			1 group for 756	1 group for 468	1 group for 1414	
	Type of training: theoretical/prac tical	Both	Both	Theoreti cal	Theoreti cal			Both	Both				
	Duration of training	3 days	6 weeks	6 days LHW, 3 days Dai	6 days LHW, 3 days TBA	36 days	6 days	36 days	7 days		7 days	5 sessions	6 weeks

	Refresher training	2-3 times (1 day)			Monthly	fortnightly		Y				Informal every 15 days	
	Supervision			Regional Programme	Programme supervisor			Doctors		Y		District co-ordinator	Nurse
	Provision of equipment and drugs			Y	Y			Y	Y				
Community Mobilization	Community advocacy groups		Y (for pregnant females)		Parents	Pregnant females		Y	Y	Pregnant females	Y	Y	
	Counseling			Y	Y			Y		Y	Y	Y	
Duration of intervention		14 mo	30 mo	24 mo	24 mo	24 mo	24 mo	84 mo	16 mo	24 mo	36 mo	36 mo	36 mo
Antenatal Interventions	Birth and newborn care Preparedness	Y	Y	Y	Y	Y	Y	Y	Y				Y

	Referrals of high-risk pregnancies	Y	Y	Y									Y
	Provision of antenatal care	Y		Y									
	Iron/folate supplementation		Y	Y	Y								
	Nutritional counseling			Y	Y		Y	Y					
Natal Interventions	Clean delivery practices	Y	Y	Y	Y			Y					Y
	Present at birth	Y		Y	Y			Y					Y
	Skilled attendants	Y	Y	Y	Y	Y		Y					Y
	CHW/ TBA training	TBA	TBA	TBA	TBA	TBA		Both		TBA	TBA	TBA	TBA

Postnatal Care	Postnatal visits	Y	Y	Y	Y	Y	Y	Y	Y				
	Promotion of breastfeeding		Y	Y	Y	Y		Y	Y				
	Neonatal case management		Y	Y	Y	Y		Y					
	Newborn resuscitation				Y			Y					
	Prevention & Mgt of Hypothermia		Y	Y	Y			Y	Y				
	Referral to sick newborn			Y	Y	Y	Y		Y				
Cost	Cost per neonatal death averted		2995\$					\$5.3		\$4,397			

	Population	13000 00	48000 0	138600	318226		4500 0	8114 7	104123	170000	228186	503163	
	Control group NMR	53	48	52.18	51.3	24.8	45.8	57.7	54.2	36.9	53.6	36.5	

WEB TABLE III Training and Supervision of Community Health Workers

Study	Training of the health worker	Supervision of the health worker
Kumar 2008 [11]	<p>CHWs (<i>Saksham Sahayak</i>)</p> <ul style="list-style-type: none"> -combination of classroom-based and apprenticeship-based field training -over 7 days -on knowledge, attitudes, and practices related to essential newborn care within the community behavior change management, and trust-building. <p>After training, suitable candidates closely mentored and supervised by a regional programme supervisor (n=4) responsible for 6.7 <i>Saksham Sahayaks</i>, for an additional week before final selection was made.</p>	<ul style="list-style-type: none"> -Regional program supervisors had daily meetings with their team to discuss the work plan, progress, challenges, and lessons learned. -Monthly programme meetings took place, in which all four regional teams came together to discuss experiences. -Performance assessment of <i>Saksham Sahayaks</i> by feedback from community members, spot checks by their supervisors during home visits and community meetings to assess their level of community engagement, and monitoring by the supervisors of whether targets for home visits and community meetings were being met.
Bang 2005 [14-22]	<p>VHWs</p> <ul style="list-style-type: none"> -36 days of classroom training -over a period of 12 months -including practicum periods in the community. <p>The training for asphyxia was given in a 3-day workshop, followed by review, practice and assessment in the next workshop 2 months later. Skills kept up by drills practiced on dummy dolls every 2 months.</p>	<p>Supervision by a physician (twice in a month), support, supplies, records, performance-linked remuneration and continued training to VHWs.</p>
Baqi 2009 [9]	<p>CHWs</p> <ul style="list-style-type: none"> -6 weeks of hands-on supervised training -in a tertiary-care hospital and in households. -Training included skills development for behavior-change communication, provision of essential newborn care, clinical assessment of neonates, and management of sick neonates with an algorithm adapted from the integrated management of childhood illness. -Refresher training sessions for management of maternal and newborn complications were provided for government health workers in all three study arms. 	
Darmstadt 2010 [12]	<p>CHWs</p> <ul style="list-style-type: none"> -trained for 36 days on -pregnancy surveillance, counseling and negotiation skills, essential newborn care, neonatal illness surveillance and management of illness based on a clinical algorithm adapted from Integrated Management of Childhood Illness. <p>After initial training and evaluation, routine monitoring and refresher training were provided each fortnight.</p> <p>TBAs</p> <ul style="list-style-type: none"> -two-day orientation session on the aims and activities of the project, essential newborn care practices, and indications for referral of newborns and mothers. 	
Jokhio 2005 [8]	<p>TBAs</p> <ul style="list-style-type: none"> -trained by a team of obstetricians and female paramedics -3 days -involved the use of picture cards containing advice on antepartum, intrapartum, and postpartum care -how to conduct a clean delivery -use of the disposable delivery kit 	

	-when to refer women for emergency obstetrical care -care of the newborn. Lady Health Workers were trained to support TBAs	
Baqi 2008 [13]	Anganwadi workers, auxiliary nurse-midwives, and change agents -6 days of training on the care of mothers and newborn babies	
Bhutta 2008 [10]	Standard LHW training takes 18 months, including 3 months of lectures) In the intervention group Addition of an extra day every 3 months (6 extra days). Additional curriculum (for intervention village clusters) 1. Promotion of adequate maternal nutrition and rest 2. Early breastfeeding (within the first hour) and colostrum administration (avoidance of prelacteal feeds) 3. Thermoregulation 4. Home care of low-birth-weight infants 5. Treatment of neonatal pneumonia with oral trimethoprim-sulphamethoxazole 6. Recognizing sick newborns and danger signs requiring 7. Training in group counseling and communication strategies TBAs -3-day voluntary training programme in basic newborn care	Standard curriculum (all village clusters) 1. Promotion of antenatal care 2. Iron and folate use in pregnancy 3. Immediate newborn care 4. Cord care (cleaning and avoiding the use of traditional materials, such as ash and lead powder) 5. Promotion of exclusive breastfeeding
Manandhar 2004 [25]	<i>Facilitators</i> -brief training in perinatal health issues. -Supervision, and a manual based on the Warmi project methodology, was integral to facilitator training and support.	One supervisor provided support for every three facilitators by attending group meetings and making regular community visits.
Bhutta 2010 [26]	Standard LHW training takes 18 months, including 3 months of lectures and monthly refresher training of 1 day In the intervention group addition of 6 extra days -to identify all pregnant women in their area, -provide basic antenatal care (including rest and nutrition counseling, screening for common illnesses, iron folate and tetanus toxoid administration) -work with traditional birth attendants (Dais) to identify births. LHWs were trained in mouth-to-mouth resuscitation Clean delivery kits were provided to LHWs in both intervention and control clusters TBAs -3-day voluntary training programme in basic newborn care	
Tripathy 2010 [24]	<i>Facilitators</i> - 7 day residential training course -to review the cycle contents -practice participatory communication techniques	<i>Facilitators</i> were given support through fortnightly meetings with district coordinators.
Azad 2010 [23]	<i>Facilitators</i> - 5 training sessions for -participatory modes of communication -maternal and neonatal health issues.	Locally recruited supervisors supported facilitators in preparing for meetings and liaising with community leaders.

WEB TABLE IV Risk of Bias in Included Studies

Studies	Adequate sequence generation	Adequate allocation concealment	Blinding	Incomplete outcome data	Selective reporting
Azad 2010	Y	Y	N	N	N
Bang 2005	N	N	N	U	N
Baqi 2009	Y	Y	N	Y	N
Baqi 2008	N	N	U	U	U
Bhutta 2008	N	Y	Y	U	N
Bhutta 2010	Y	Y	Y	N	N
Greenwood 1990	N	N	U	U	U
Darmstadt 2010	Y	Y	Y	N	N
Jokhio 2005	Y	Y	N	Y	N
Kafatos 1991	Y	Y	U	U	N
Kumar 2008	Y	Y	Y	N	N
Manandhar 2004	Y	Y	N	N	N
Tripathy 2010	Y	Y	N	N	N

U=unknown, Y=yes, N=no

WEB TABLE V Program Coverage for Controlled Trials

Study	Program coverage	Parameter	Effect on NMR
Baqui 2008 [13]	20.3	Postnatal visit within 3 days	1.06(0.81-1.38)
Bhutta 2010 [26]	34	Postnatal visit within 3 days	0.85(0.76-0.96)
Bhutta 2008 [10]	56	Postnatal visit within 48 hours	0.70(0.54-0.90)
Baqui 2009 [9]	62	Postnatal visit (day 1,2)	0.66(0.47-0.93)
Kumar 2010 [11]	67.9	Postnatal visit (day 1)	0.50(0.36-0.69)
Darmstadt 2010 [12]	69	Postnatal visit (day 1,2)	0.86(0.68-1.09)
Bang 2005 [14-22]	90	HBNC	0.39(0.27-0.56)

WEB TABLE VI Effect of Number of Home Visits on Neonatal Mortality Rate (NMR)

Study	Antenatal home visits	Postnatal home visits	Total visits	Effect on NMR
Baqui 2008 [9]	1	Within 28 days	2	1.06(0.81-1.38)
Kumar 2008 [11]	2	Day 1,3	4	0.50(0.36-0.69)
Baqui 2009 [13]	2	Day 1,3,7	5	0.66(0.47-0.93)
Darmstadt 2010 [12]	2	Day 1,3,6,9	6	0.86(0.68-1.09)
Bhutta 2008 [10]	2	Day 1,3,7,14,28	7	0.70(0.54-0.90)
Bhutta 2010 [26]	2	Day 1,3,7,14,28	7	0.85(0.76-0.96)
Bang 2005 [14-22]	2	Day 1, 8-10 during neonatal period	13	0.39(0.27-0.56)