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Research Article

Providing Community based Birth and Immediate Perinatal Care to Pregnant Women in Rural Districts of Zambia: Results of a Randomised Community Interventional Study in Mpongwe and Chongwe

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Abstract

The aim of the community based randomized control interventional study was to establish the capabilities of community health workers (CHWs) and traditional birth attendants (TBAs) to provide primary, home based maternal and immediate neonatal care. A total of 3846 pregnant women were recruited and 2000 gave birth during the study and 63% of these were delivered at home by the TBAs. CHWs and TBAs had been trained to provide antenatal care, delivery and perinatal and newborn care in the pilot districts.

Both the intervention and control groups were trained but only the intervention groups were equipped for the various interventions, while the control group provided routine Ministry of Health care. During the study 27% and 29% were pregnant in Chongwe and Mpongwe respectively. Home deliveries in respective districts were 57%, Chongwe; and 29% Mpongwe. Health centre deliveries were 40% Chongwe and 62% Mpongwe. More women in the intervention sites received perinatal care than in the control sites ($p < 0.01$). The CBAs were able to identify and record the danger signs such as: retained placenta, severe vaginal bleeding, prolonged labor and increased blood pressure. They also provided delivery and perinatal care such as: skilled attendance at delivery, observing for danger signs in the mother, observing for danger signs in the newborn, resuscitation of babies with asphyxia, and essential newborn care at birth. They referred complicated cases when they identified danger signs in the pregnant woman or baby. They additionally provided Prevention of Mother to Child Transmission care and administration of NVP to mother and newborn, while counseling the family when danger signs were identified. They encouraged early breastfeeding, keeping the infant warm, with Kangaroo Method of Care and referred those with complications.

Training, equipping and supervising community based health care givers, enabled them to capably offer antenatal, delivery and perinatal care which improved the wellbeing of pregnant women and their infants, in the early postnatal period. While Zambia upgrades the cadre of community health care givers, there is still need to give care to pregnant women.

Keywords: *Birth; Perinatal Care; Pregnant Women; Zambia*

Introduction

The life of the pregnant woman and her infant rests on the care they receive during the antenatal and perinatal periods. The most dangerous time for a pregnant woman is the period of labour and delivery and the first seven days after delivery. This is the climax of the peri-

natal period when most women die. Zambia reports a decline in maternal mortality over the last decade, with efforts in rural areas utilizing community based health agents such as, Safe motherhood Action Groups, (SMAGS) and other variations supported by the community and Ministry of Health. The 2018 Zambia Demographic Health Survey pegs the maternal mortality at 213 per 100,000 live births [1,5-8].

The increase in the birth rate has not been commensurate with the increase in medical personnel in this case midwives, nurses and doctors who provide the much needed perinatal, newborn and postnatal care. This has perpetuated the rift that exists in the ratio between health care staff and the community. We therefore have human resource health crisis. Strides are being made to augment the provision of perinatal and newborn care by training of CHW and TBA.

We report the results of a randomized trial in two rural districts of Zambia Mpongwe and Chongwe regarding the provision of skilled antenatal delivery and perinatal care by trained TBAs and CHWs.

Methods

This article focuses on the continuum of care, during the pregnant woman's antenatal and perinatal care. The Neighborhood Health Committee (NHC) was the smallest functional unit in the community with whom the study worked. Each NHC provides basic health care to approximately 150 to 200 households (a population of 900 to 1200). The study worked with a total of 40 NHCs, 20 in each district centered around 5 Rural Health Centers (RHC). RHCs acted as the central supervision and distribution point for training, equipment and supplies. The figure below depicts the organization of the study at the RHCs [2-4].

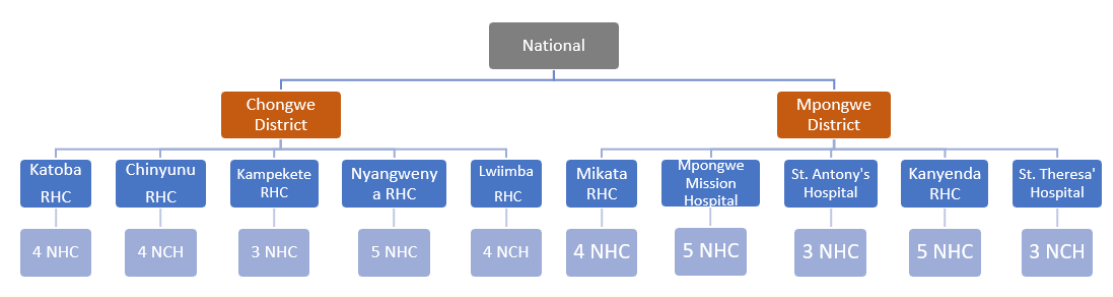


Figure 1: *Chart of organization and distribution of RHCs and NHCs in the districts.*

The RHCs and NHCs were randomly selected, the NHCs were further randomly allocated as either control or intervention sites (Annexed: Table of RHC and NHCs). Randomization was by simple technique. To prevent any clashing of intervention and control sites, any two NHCs too close together would be returned and randomly reselected. There was at least a minimum geographical distance of 10 Km between intervention and control sites to prevent crossover of participants.

The CHWs and TBAs were trained in vital ANC, perinatal and newborn care strategies and interventions. A seven day participatory training workshop followed by a month's attachment at the RHCs for practical hands on training on basic clinical skills i.e. taking temperatures, weighing babies, counting respirations and health education was undertaken.

Five-day refresher trainings were held every four months in both districts to cement the knowledge and skills imparted during the initial training with at least two supervisory visits per month by district clinical and data officers. This was also reinforced with monthly national supervisory visits during which difficulties and training materials were reviewed one- on- one or in group discussions.

Results

A total of 2000 out of the 3846 (52%) pregnant women delivered by the end of one year of the study. The flow chart depicts the numbers of women who retuned for antenatal, delivery, perinatal and postnatal care, up to 28 days of life.

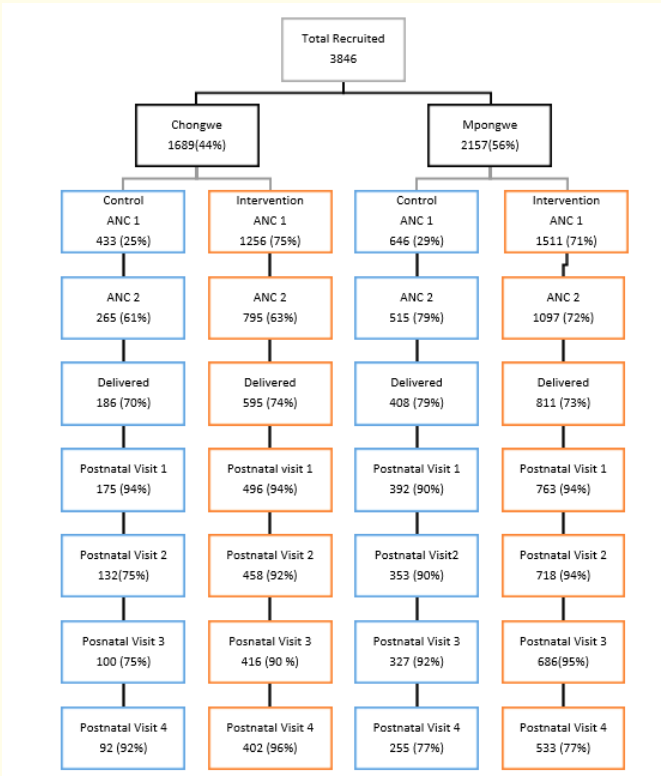


Figure 2: *Flowchart demonstrating the attendance to care by pregnant women. Red signifies intervention group, while blue signifies control group.*

Antenatal care

The intervention group seemed motivated to receive antenatal care as shown by the percentages, 71 to 75% belong to the intervention group, for the first visit against 25 to 29% from the control group. The numbers decline from first visit to second visit and even more so with subsequent visits. Effective antenatal interventions must therefore be provided in the first and second visits or effort made to get women to come back for care or visit them where they are.

Delivery profile

	Intervention (n = 2767)	Control (n = 1079)	P Value
Mean Gestation Period	8.6 Months	8.46 Months	0.461
Pre term (< 28 weeks)	8%	13.4%	0.0008
Post term (> 36 weeks)	4.8%	5.3%	0.7672
Mean Hours of Labour	7.63Hrs	6.88Hrs	0.012
Delivered at Home	63.1%	57.8%	0.031
Delivered by TBA	54%	53%	0.625
Trained TBA	50.7%	53.7%	0.406

This profile shows that 63.1% of the women delivered at home in intervention sites 57.8% in control sites. A large proportion, 49% of women who delivered were unattended by any trained attendants, and had to deliver by themselves, or were delivered by untrained attendants or other members of the community.

In general, the intervention sites had more women who attended perinatal care than in the control sites. The community based health workers were able to identify the danger signs, which included, retained placenta, severe vaginal bleeding, prolonged labour, hypertension, high fever and complications with the umbilical cord.

Danger signs and complications identified by CBAs during institutional and home deliveries

Danger sign/Complication	Home deliveries (n = 1286)		Institutional deliveries (n = 714)	
	Intervention	Control	Intervention	Control
Retained placenta	28	0	3	0
Severe Vaginal Bleeding	25	5	16	1
Prolonged Labour	18	2	20	11
Hypertension*	5	2	2	3
Other	9	5	4	3
*Hypertension = Convulsions, High BP, swollen hands feet and legs				

A higher number of complications were reported in the home deliveries compared to the deliveries at the health centers. All the women with danger signs in the intervention sites were referred to the health centres.

Perinatal care

Interventions provided by CBAs during perinatal period during home deliveries

	Intervention		Control	
	Home	Health center	Home	Health Centre
Counseled for danger signs	2	0	1	0
Nevirapine to Mother	23	15	0	0
Nevirapine to Newborn	22	15	0	0
B/feeding Counseling	1	0	4	0
Referred for complications	57	37	16	20

Intervention sites were more able to refer, provide PMTCT and NVP[1] to the mother and newborn and counsel for danger signs. They also counseled for breastfeeding.

Care given to mother at postnatal visits

Community Based agents screened postnatal mothers for danger signs: bleeding, infection and breast feeding difficulties. They offered breastfeeding counseling and continued prevention of mother to child transmission with nevirapine for mother and baby.

*This was in line with the then existing MOH/WHO PMTCT guidelines.

At each postnatal visit the CBAs screened mothers for difficulty breast feeding, vaginal bleeding (and retained placenta), convulsions, fever, abdominal pains, hypertension, severe headache, swollen hands and feet and HIV screening for those missed. The postnatal visits were offered on days 1, 3 and 7 respectively.

The table below shows the number of post natal visits with the corresponding attendance.

Number of visits each postnatal day

	Intervention	Control	Z-Value	P-Value
PNV1	1121 (79.7%)	473 (79.6%)	0.01	0.992
PNV2	1002 (71.3%)	379 (79.6%)	3.827	0.0001
PNV3	1006 (71.6%)	353 (59.4%)	5.255	0.0001
PNV Other	362 (25.8%)	139 (23.4%)	1.052	0.2928

There was a significant drop ($p < 0.01$) in postnatal attendance between the first and second postnatal visits in both the intervention and control.

Actions taken by CBAs at postnatal home visits

	PNC Visit 1		PNC Visit 2		PNC Visit 3	
	Intervention	Control	Intervention	Control	Intervention	Control
Breastfeeding Counseling	16	14	3	5	5	2
PMTCT	1	-	-	-	1	-
Referred	21	13	5	6	6	4

The CBAs in both the intervention and control sites referred mothers with postnatal complications to the next level. The majority of the women were referred on their first postnatal visit. Among the reasons for referral were: vaginal bleeding (7), postnatally diagnosed HIV mothers (4), fever (7-possible puerperal sepsis) and abdominal pains (7). A total of 55 women were referred for complications during the post natal visits.

Postnatal visits in the newborn

A total of 1282 (33%) of all pregnant women recruited, were followed up from pregnancy, delivery and through the neonatal period by the Community Based Agents. Among the participants that delivered in intervention and control groups 66.4% and 58.6% respectively, were followed through the continuum of care from the antenatal period to the end of the neonatal period.

The table below shows the breakdown in intervention and control groups and according to visits. As in the mother, the postnatal visits were made on days 1, 3 and 7 respectively.

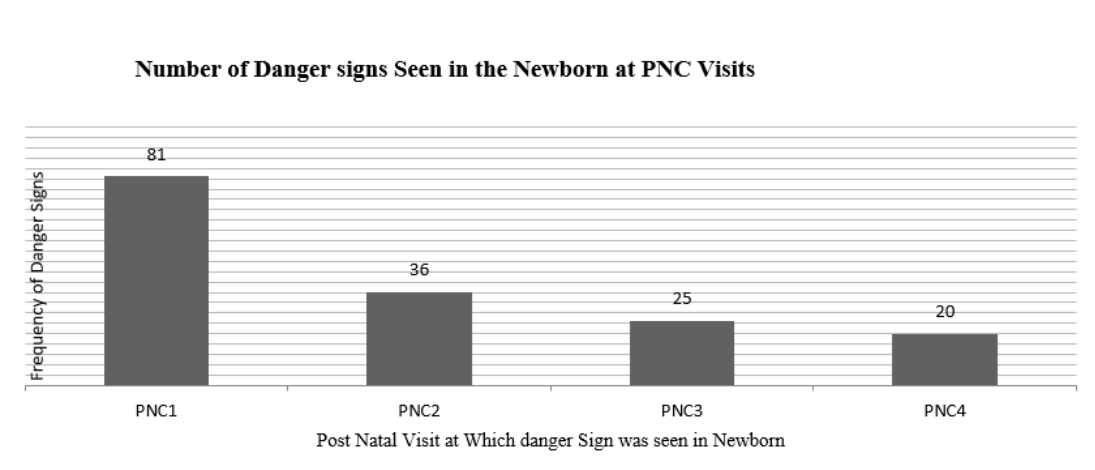
	Intervention	Control	Z-Value	P-Value
PNV1	1260 (89.6%)	567 (95.5%)	4.151	0.0001
PNV2	1176 (83.6%)	485 (81.6%)	1.019	0.3082
PNV3	1203 (85.6%)	406 (68.4%)	8.806	0.0001
PNV4	934 (66.4%)	348 (58.6%)	3.289	0.001
PNV Other	103(7.32%)	42(7.07%)	0.111	0.9116

NB: Denominator in intervention = 1406 (Number of participants that delivered in the intervention) and Control = 594 (Number of participants that delivered in the control):

- The drops in the control site are significantly higher than the intervention sites.
- There is an increase in the number of visits in PNC 3 than PNC2 in the intervention site. Then a significant drop of 22.36% between PNC3 and PNC4.

The danger signs identified at each postnatal visit included: Asphyxia (indicated by the baby's inability to cry), serious infection (indicated by fever/hypothermia, fast breathing/chest indrawing, lethargy or difficulty in breathing, combination of any two) local infection (red or pus on umbilicus, skin pustules, pus in eyes) and preterm babies (Detail will be available in a paper on neonatal infection).

Most of the danger signs were reported at the first postnatal visit with a subsequent decline between the second and the last PNC visit. Community based agents were able to identify a large number of danger signs. There were significantly more danger signs identified in the intervention group than the control group (p-value = 0.0001).



Figure

Some of the interventions provided during the neaonatal post natal visits included: active treatment of those with signs of active infection with Amoxil (33) or gentamycin (11), breastfeeding counseling (48) and referring those with signs of severe infection. A total of 79 newborns were referred to the next level.

Discussion

Zambia beyond 2020 aims to increase health care capacity by training more health workers and a higher caliber of more educated community health assistants. As this is happening, decentralization has resulted in an increase in districts, from 72 to 117. Infrastructure, health facilities, health workers and equipment remain a challenge. Because the pace of change may not reach all who need care immediately, there still remains need for the nearest community based health care giver to step in. Realistically it is better to use something you know may work, than nothing at all. The continuum of care which was provided in our study, identified the period of delivery, perinatal care and postnatal care as inadequate for the pregnant woman. Although antenatal care attendance is high, the quality of care and continued visits may not be adequate to safeguard the health of both mother and infant [5-8,12].

Training of CBAs, equipping them and supervising showed that they were able to counsel the patient and family, provide services such as identifying danger signs during antenatal, delivery, perinatal and postnatal periods of care. They also referred women appropriately.

Chelumeau., *et al*. (2002) found that these danger signs during the peripartum period if identified could prevent late still births. They concluded that these signs identified in the late antenatal period (8 months) could signal possible late still births [11].

Our intervention sites showed that more women attended perinatal care in the intervention than control sites. This was due to the encouragement they received from the motivated CBAs. The community based health workers were able to identify the danger signs, which included, retained placenta, severe vaginal bleeding, prolonged labour, hypertension, high fever and complications of the cord resulting in 55 referrals. More complications were reported in home deliveries compared to the deliveries at the health centers and all the women with danger signs in the intervention sites, were appropriately referred to the health centres.

The CBAs conducted HIV testing using oraquick saliva testing and administered NVP to both the mother and baby according to the MOH guideline.

In some cases however, treatment of pregnant women in the community is not feasible as complications tend to be complex and require emergency obstetric care that can only be provided at health centers by obstetric trained health practioners [10,12].

Though the scope of the CBA in these instances seem limited, their value lies in the information and data they provide. With over 60% pregnant women delivering at home in rural areas, CBAs can provide valuble information on what is happening on the ground and urge communities to support urgent refferals [12].

This study shows that CBAs can be used to strengthen and complement perinatal care in communities. CBAs were able to encourage women to attend ANC, have HIV testing, receive PMTCT care, undertake health education and assist with birth preparedness. Clearly, CBAs are an able pair of hands, to provide standard care within the community and thus improve women's attendance to ANC services [10,12,15,17].

The perinatal mortality rate, defined as the number of perinatal deaths per 1,000 total births is a major marker to assess the quality of health care delivery [8]. Not surprisingly, the perinatal mortality rate in developing countries may at times be ten times higher than in developed countries [9]. Inadequate health staff and facilities are only but a part of the many reasons for these gnawing statistics. The training of CHWs in various cardinal perinatal interventions for both mother and baby has the potential to save lives of the mother and the new born [10,14,17].

Conclusion

Despite the goodwill and new impetus from government and funders, geographical distance and competition for limited resources, are hurdles to overcome on the road to adequate health service provision for all Zambians. The CBAs live in the same community as the preg-

nant women and thus have the trust of the community. They are able to identify and track pregnant women and identify danger signs and make appropriate referrals. It is therefore important to adequately train, equip and supervise CBAs to provide these lifesaving interventions, helping to reduce morbidity and mortality. While primary health care and health facilities receive formal support, there is sufficient evidence to allow the health system to maximise the potential of community health care givers, especially where there are no trained health professionals. The training, equipping, supervising and providing incentives spurred and motivated community health workers to offer appropriate services. Zambia should not discard them so easily, until adequate health care services reach all the unreached.

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