

Sundari, T.K. : Can health education improve pregnancy outcome? : Report of a grassroots action-education campaign. The Journal of Family Welfare. March 1993. 39(1). P. 1-12.

Can health education improve pregnancy outcome? : Report of a grassroots action-education campaign

Ms. T.K. Sundari

Introduction

Pregnancy outcome in any given community-the probability of a pregnancy terminating in a full-term, healthy live birth-is a powerful indicator of the health status of its women, and of the quality of health care available to them during pregnancy and birth. There is a two-way relationship between women's health and pregnancy outcome. That poor maternal health results in high rates of foetal and early infant death is well known. It is often not just the cause, but also the consequence of repeated miscarriages, stillbirths as well as early infant deaths. Incomplete miscarriages when not treated are a source of serious reproductive tract infection. Fetal death in uterus, if not detected in time and followed up with prompt hospitalisation, can endanger the mother's life. Repeated attempts at pregnancy to compensate for these losses can result in great physical and emotional damage. And yet, for poor women, especially in developing countries, this is a common phenomenon.

The probability of negative pregnancy outcome: miscarriage, stillbirth, or death in early infancy-in a community is also likely to adversely influence decision related to fertility control. One school of thought firmly believes that high fetal and perinatal mortality causes a tendency for reproductive compensation; women with an intrinsically higher risk of negative pregnancy outcome have more pregnancies in order to ensure that they have at least the number of children they desire. [1-3] This may compel women to reject contraception, resulting in larger family sizes than they desire. The effect of negative pregnancy outcome on contraceptive practice is especially likely with respect to avoidance of birth spacing. Experiences with miscarriages, stillbirths and early neo-natal deaths (not only one's own, but of the community one belongs) reinforces a sense of uncertainty regarding matters related to fertility: the feeling that while it may be easy not to have children through contraception, it may not be possible to have a birth as and when one desires. In other words, it increases the risk associated with birth spacing, in societies where economic insecurity and social norms make a certain minimum family size imperatives.

Improvement of pregnancy outcome is thus an important area of action for those concerned with the improvement of women’s health. It is for this reason that the Rural Women’s Social Education Centre, a grassroots women’s organisation in South India concerned with the promotions of women’s and community health, undertook an intensive health action-education campaign. This paper reports the outcome of this campaign, and discusses the implications of the findings, some of which are unusual in the light of current literature on the subject.

Levels and causes of negative pregnancy outcome

Levels

By negative pregnancy outcome we mean all pregnancy outcomes other than a live birth and a voluntarily terminated pregnancy. It includes spontaneous abortions (miscarriages), stillbirths and early neonatal mortality. Miscarriage is defined as the premature expulsion from the uterus of the product of conception before 28 weeks of pregnancy, while stillbirth is a foetal death after 28 weeks. Early neonatal mortality refers to death of the infant within the first seven days after birth. We have chosen to include early neonatal mortality as a negative pregnancy outcome because often stillbirths and infant deaths immediately following birth have a common etiology, and are related to maternal rather than to environmental factors. It is usual to combine stillbirths and early neonatal deaths as one category, namely perinatal mortality.

Collecting population-based data on pregnancy outcome is beset with enormous difficulties. Retrospective studies tend to result in gross under-reporting due to memory lapses. Further, the data in this instance is often based on pregnancy histories of women over a period of twenty to thirty years, during which conditions influencing pregnancy outcome may have changed a great deal. Again, respondents may not differentiate between miscarriages and stillbirths accurately, and induced abortions get reported as miscarriages. It is, therefore, not surprising that community studies from different parts of India report widely varying rates of pregnancy wastage (miscarriages and stillbirths), ranging from 17.8 to 156 per 1000 pregnancies (Table 1).

Table 1 : Rates of negative pregnancy outcome: Various studies

State/Country	Rates of negative pregnancy outcome		
A. Foetal mortality (Pregnancy wastage)	Miscarriages	Stillbirths (per 1000 pregnancies)	Total

Punjab (1965)	107	35	142
Punjab (1988)	108	48	156
Rajasthan (1978)	-	-	139
Tamil Nadu (1976)	20	16	36
Tamil Nadu (1978)	4.5	13.4	17.9
Bangladesh (1985)	113	40	153
B. Perinatal mortality	Stillbirths	Early neonatal deaths (per 1000 total births)	Total
Maharashtra (1984)	8.4	21.4	49.8
Bangladesh (1990)	37	38	75
Kenya (1979)	-	-	46.7
India (1988)	13.5	-	-
Tamil Nadu (1988)	15.6	-	-

The levels of pregnancy wastage among women from poorer communities is steeper. In their study of 2537 rural and 2021 urban women from a low socioeconomic group subsisting on a calorie intake of less than 1850 kcals, Gopalan and Naidu [1] observed a pregnancy wastage rate of 30 percent. Pregnancy wastage rates in India are high when compared to a number of developing countries. According to a study discussing WFS results from eight developing countries, the pregnancy wastage rates ranged from 71 per 1000 pregnancies in South Korea to 126 per 1000 in Costa Rica. [4] Bangladesh has rates comparable to India: 153 pregnancies lost per 1000, according to a study by Pebley et al, [5] with a miscarriage rate of 113, and a stillbirth rate of 40 per 1000 pregnancies. [5]

The perinatal mortality rate in India as reported by a community study in Maharashtra [6] (49.8 per 1000 births) compares favourably with community studies in other developing countries. A study from Kenya [7] reports 46.7 perinatal deaths per 1000 births, while another from Matlab, Bangladesh, [8] reports a perinatal mortality rate of 75.

Causes

A number of causes of fetal death and early neonatal mortality have been identified. Early spontaneous abortions occurring within the first fifteen weeks are predominantly associated with defective germ plasma or chromosomal abnormalities.

Later abortions may be the result of an in-competent cervix, which is unable to remain closed until just before the onset of labour. Weakening of the cervix due to poor health and nutrition, or repeated pregnancies, can lead to this condition; the cervix dilates under the increasing weight of the baby, causing an abortion. Another cause of late abortions is infection of the foetus caused by an ascending infection of the mother's genital tract (reproductive tract infections), or transmitted through blood circulated through the placenta. Abortions can sometimes be caused by severe infection resulting in fever, which stimulates uterine contractions, and also tends to reduce uterine oxygen supply. Hypertensive disorders of pregnancy are another cause, which predisposes to late abortion.

Stillbirths and early neonatal deaths are often associated with premature births and low birth weights for other reasons. Hypertensive disorders of pregnancy, folic acid deficiency, and trauma (injury) can result in premature detachment of a portion of the placenta and severe hemorrhage, with a very high risk of both foetal and maternal death. Other causes of stillbirth and early neonatal death include foetal hypoxia (low oxygen supply) or foetal anoxia (no oxygen supply) which occur due to placental insufficiency for various reasons. One major cause is poor nutrition and especially anaemia in the mother. The Bangladesh study discussed above [8] finds the mother's weight gain during pregnancy to be related significantly to foetal mortality. Even when preconception weight and weight gain were held constant, season of conception was strongly associated with foetal death. The authors see this as reflecting the seasonality of women's work or of diseases.[5]

According to yet another study from West Bengal, women who suffered from anaemia (Hb 12gms/dl) had a pregnancy wastage rate of 48.5 per 1000 as against 24.1 for women without anaemia [9]. Foetal hypoxia or anoxia may sometimes be the result of prolonged or difficult labour often associated with hemorrhage, (including those due to foetal malposition or a contracted pelvic bone). Parasitic and viral infections in the mother including common problems such as amoebiasis, malaria, hepatitis, and reproductive and urinary tract infections may also be responsible for causing stillbirths and early neonatal deaths either by causing premature labour, or through infection of the foetus. [10], [11]

In studying pregnancy outcome, demographic characteristics of the mother and infant have received considerable attention. The general conclusions have been that a negative pregnancy outcome is more likely in teenage pregnancies and pregnancies at older ages (above 35 years); during first pregnancy and in higher orders of pregnancy (varying from 5+ to 8+ in different studies); and in pregnancies terminated within 24 months of the termination of a previous

pregnancy. [12-15] There is, however, more consistent evidence of negative outcome associated with pregnancies at older ages and higher order pregnancies, than for teenage and first order pregnancies. [4] Another biological factor that increases the risk of negative pregnancy outcome, is a past history of foetal and early neonatal mortality.

Relatively few studies look into socioeconomic correlates. Some studies looking at data related to pregnancy wastage show that miscarriage rates are relatively independent of socioeconomic status. [8], [12] Yet others find higher miscarriage rates for women from higher socioeconomic groups and assume this to reflect no more than better reporting by women from these sections. [4], [15]. On the other hand, there seems to be agreement that perinatal mortality has a negative gradient by social class. [14], [16], [17] Bobadilla [18] in a comprehensive review of literature on perinatal mortality, observes that health problems such as stillbirths and early neonatal deaths are multicausal, having only a weak association with single risk factors such as age, parity and birth interval. This is to be expected, because such factors often interact with each other and with biological variables such as maternal weight and weight gain during pregnancy. Higher parity at a lower age implies shorter birth intervals. Teenage pregnancies are risky more because the incomplete physical development of the mother makes obstructed labour imminent. Later pregnancies and higher order pregnancies may be associated with poor maternal health and nutrition. And again, the extent of risk associated with any of these is closely related to the quality of health care during pregnancy and delivery, determined by the socioeconomic status of the mother. A prospective study that considers demographic, biological and socioeconomic factors simultaneously would therefore be necessary for a better understanding of the nature of relationships.

The health action-education campaign

The Campaign Phase

As mentioned above, the health action-education campaign to improve pregnancy outcome was undertaken by Rural Women's Social Education Centre (RUWSEC), a rural women/s organisation involved in health promotion and education in Tamil Nadu, South India. The campaign was launched in February 1990, among a rural population consisting predominantly of poor agricultural wage labourers with little or no land. Forty-seven rural hamlets were included in this campaign, covering a total population of 23562 residing in 4386 households.

The campaign consisted of identifying pregnant women in the population, carrying out health education activities and providing basic health care and advice to these women, and encouraging hospital delivery in case of high-risk

pregnancies. Use of simple delivery kits in case of home delivery to ensure adherence to asepsis was also promoted.

The community health workers of RUWSEC who reside in the vicinity of the hamlets included in the campaign, made repeated household visits over a three-month period between February and April 1990, to identify pregnant women. Two hundred eighty four women whose pregnancies ranged between the third and seventh month of gestation were included in the campaign. Baseline data was collected during the first visit. This consisted of detailed pregnancy histories of the women including details about the current pregnancy, and information about the socioeconomic background of the women and their families.

A series of activities followed this initial visit. Pamphlets on risk factors and danger signals in pregnancy were distributed to pregnant women, along with a manual for assembling simple delivery kits, and a booklet on birth control methods. Keeping in mind that many of the women are illiterate, these pamphlets were read out and explained to them. The idea behind distributing written material was to leave behind with the households a constant reminder, and to reach out to the male members who are most often the only literate members of the household. Women were encouraged and reminded to take their tetanus toxoid immunisation, and RUWSEC's workers liasoned with the Auxiliary Nurse Midwives of the Government Primary Health Centres to ensure that antenatal clinics were held in these hamlets. A series of workshops (each bringing together a duster of hamlets) explaining the process of pregnancy and childbirth, and appropriate self-care during this period, was organised jointly for the pregnant women, traditional birth attendants and women leaders in the community in an effort to go beyond informing, and to influence popular opinion. Women leaders were requested to speak to decision-makers in the households of pregnant women who belonged to the 'high risk' categories to ensure institutional delivery.

Based on information collected in the baseline enquiry, house visits were made within a week following the expected date of delivery of the pregnant women. A second enquiry was carried out at this time, regarding the nature and outcome of delivery and place of delivery. Detailed information was sought on complications during pregnancy, delivery or immediately following it. During this visit, the mothers were also advised on self*care and care of baby in the early days and those with health problems were encouraged to seek medical help. Babies who had been delivered at home were asked to be taken to the Primary Health Centre for BCG vaccination.

The second house visit after delivery was made after a monthly following delivery. This visit was meant to capture neonatal deaths if any, and serious

health problems that the mother or infant may have suffered during this period. The visit was also used to give information to the mother on immunisation, and on supplementary feeding after the first three months. We present below results of our education campaign as reflected in appropriate health seeking behaviour on the part of the pregnant women, and further, on reduced incidence of negative pregnancy outcome. We also attempted to explore factors associated with negative pregnancy outcome in the present instance, so that these may be taken into consideration explicitly in any future campaign.

Baseline findings

Population characteristics

Two hundred eighty four pregnant women were identified over a three-month period in a population of 23564, which gives an extremely high crude birth rate of 36.2 per 1000 population. Seventy three percent of the pregnant women belonged to the scheduled castes, far in excess of the proportion of scheduled caste persons in the total population, which was 60 percent. The population covered by the campaign was overwhelmingly poor and illiterate: 64 percent of the women were from landless households, and those landed had marginal holdings of less than one acre; 79 percent were illiterate, and 60 percent worked as wage labourers in a agriculture.

Thirteen percent of the pregnant women were adolescents between 15 and 19 years of age, 12 percent were above 30 years old, while the vast majority were between 20 and 29 years old. A third of the women were pregnant for the first time, and only 13 percent of the pregnancies were of order five and above. In other words, only a small proportion of the pregnant women belonged to the 'high risk' age and parity groups.

Pregnancy outcome in the past

Of the 284 women, 90 were pregnant for the first time. One hundred ninety four women had had 469 past pregnancies. Thirty of these had ended in miscarriages, 17 in stillbirths and 19 in early neonatal deaths. The pregnancy wastage rate thus was 100.2 per 1000 pregnancies. The stillbirth rate was 38.7 per 1000 total births, and the early neonatal mortality rate stood at 43.3 per 1000 total births, giving a very high perinatal mortality rate of 82 per 1000 births. Pregnancy wastage rates in the present population were lower than those found by the various community studies discussed above, which may be a result of under-reporting that is likely to occur in retrospective reporting. However, the stillbirth rate is very high, and so also the early neonatal death rate.

Place of delivery during past pregnancies

Seventy eight percent of all past deliveries had taken place at home under the supervision of a traditional birth attendant, and only 22 percent of the deliveries were institutional. Sixty five percent of the women (who had at least one delivery in the past) had never had an institutional delivery.

Impact of the health action-education campaign

Changes in health-seeking behaviour

One of the most striking results achieved by the health-education campaign is the steep increase in the proportion of hospital deliveries. One hundred twenty-five of the 275 deliveries or 45.5 percent were institutional deliveries, as compared to only 22 percent prior to the campaign. Even more encouraging is the finding that a very high proportion of women who developed complications during pregnancy or delivery were taken to a health facility, and that this was a conscious choice. One or more complications such as prolonged or obstructed labour, breach and premature labour, heavy loss of blood during labour or postpartum, and hypertensive disorders of pregnancy were encountered by a significant proportion women. And many more women with a problem had institutional deliveries than those without a problem (Table 2).

Table 2 : Percent distribution of women by place of delivery and complications during current pregnancy or delivery, Chingleput, 1990

Complications	Place of delivery		Total
	Home	Health facility	
Prolonged labour	41	59	100
Yes	60	40	100
No			
Breach	0	100	100
Yes	55.5	44.5	100
No			
Complicated labour *	24	76	100
Yes	61	39	100
No			

Excessive bleeding	40	60	100
Yes	60	40	100
No			
Hyp. disorders of pregnancy	34	66	100
Yes	57	43	100
No			

Source: Field survey.

* includes those with premature labour and delivery, no labour pains after rupture of membrane, or sudden cessation of labour pains.

The campaign can claim success, in as far as influencing health-seeking behaviour is concerned. To what extent did this make an impact on pregnancy outcome?

Outcome of the current pregnancy

Of the 284 pregnancies followed up by the campaign, 7 ended in miscarriage, one was an induced abortion, and there was one maternal death. The number of miscarriages is low since only pregnancies over three months of gestation were considered (all of them are thus second trimester miscarriages). The maternal death was due to jaundice in the third trimester of pregnancy, to a young woman whose health had been poor throughout.

Two hundred seventy five births were carried to term. Of these, seven were stillbirths and only 268 were live births. Pregnancy wastage thus works out to 59.8 per 1000 pregnancies, and the stillbirth rate to 25.45 per 1000 total births. There were eight early neonatal deaths (29.1/1000), making the number of perinatal deaths 15 out of 275 total births, or 54.6 per /1000 total births.

It may not be appropriate to compare pregnancy wastage rates in the present instance with past rates or those reported by other studies because all first trimester miscarriages were excluded. However, when we compare rates of second trimester pregnancies with those reported by the Khanna Study in Punjab [19] and Bangladesh study [5] we still find the rates to be below: 24.6 per 1000 pregnancies as against 35 and 30 respectively for the former two. We find that both the stillbirth rate and early neonatal death rate were nearly halved, a

significant decline from earlier rates obtained in the baseline survey. Nevertheless, as compared to the perinatal mortality rates from other studies (Table 1) these are still high.

Fewer second trimester miscarriages may be attributed to better self-care, prevention of infections, and treatment of anaemia through regular house visits by RUWSEC's health workers. It may not be inappropriate to conclude that the high rate of institutional deliveries have had an important role to play in the decline of stillbirth and early neonatal mortality rates. Negative pregnancy outcome was strongly associated with prolonged and complicated labour as well as hemorrhage. Four stillbirths were associated with prolonged labour, one stillbirth with hypertensive disorders, one with breach, and two (including the one with hypertensive disorder of pregnancy) with premature delivery. Six of the seven early neonatal deaths were associated with prolonged labour resulting in excessive blood loss during delivery or after. The rate of stillbirths and early neonatal deaths would have been much higher had these women delivered at home, and there may have been a risk of loss of maternal life as well.

There is however, one disconcerting finding in this respect. While an overwhelming majority of women who developed pregnancy related complications went to hospital for delivery, and only a relatively, small proportion of them experienced a negative pregnancy outcome, six of the seven stillbirths took place in hospital and only one at home. Five of the nine early neonatal deaths occurred in hospital as well. What is more, while the proportion of women developing postpartum sepsis was only 1.3 percent among women who delivered at home, it was 12.8 percent for those who delivered in hospital. Similarly, while 12.7 percent of those who had a home delivery developed an infection with fever within the first month, the corresponding figures for those who had hospital deliveries was 23.2 percent. This could either mean that women who delivered in hospital were high-risk women, or that they picked up cross infections in the health facility.

What does this imply? It seems that provision of quality antenatal care, continuous monitoring during pregnancy and institutional delivery in case of complications does not guarantee prevention of loss of life. A likely reason is that the women's health was poor to begin with, and interventions during pregnancy can only have a limited impact.

Factors associated with negative pregnancy outcome

The highest proportion of negative pregnancy outcomes was to women who were pregnant for the first time. Twelve percent of all first pregnancies ended in miscarriage, stillbirth or an early neonatal death. The proportion of negative

pregnancy out-come was comparatively lower for all other parities, including those of order five and above. This finding is somewhat modified if we consider foetal and neonatal deaths separately. Women of parity two and three had a slightly higher rate of neonatal deaths than primiparae women (Table 3). However, this does not alter the finding that negative pregnancy outcome is associated more with lower order pregnancies contrary to the findings reported by other studies which find a J-shaped relationship between parity and negative pregnancy outcome: high for primiparae, low for parities two to four or five, and increasing steeply thereafter.

Table 3 : Rates of negative pregnancy outcome by characteristics of women, Chingleput, 1990

Characteristics	Pregnancies	Miscarriages	Stillbirths	Early neonatal deaths	Total per 1000 pregnancies
Parity	90	3	5	3	122
1	67	1	1	3	60
2	52	0	1	2	58
3	75	3	0	1	53*
4+					
Age	37	0	0	0	0
15-19	128	6	6	4	117*
20-24	86	0	1	4	58
25-29	18	0	0	1	56
30-34	15	2.0	0	133	
35+					
Caste	209	5	1	6	57
Scheduled	75	2	6	3	146
Other					
Land ownership	105	3	3	4	95
Own land	179	6	4	5	84
Landless					
Education	100	3	3	3	90
Literate	184	4	4	6	76
Illiterate					

Occupation	209	5	2	5	57
Remunerated workers	75	2	5	4	147
Unremunerated workers					

Source: Field survey.

* If the maternal death was included as a negative pregnancy outcome, the rates would be 67/1000 for parity 4+ and 125/1000 for the age group 20-24.

Once again, contrary to the findings of other studies, current pregnancy outcome was not related to outcome of past pregnancies. This is mainly because negative pregnancy outcome, in our case, was over-whelmingly associated with first pregnancies (and therefore there were no previous pregnancies to compare with). However, seven of the nine early neonatal deaths were to women who, although they did not have a negative pregnancy outcome in the past, had a history of difficult and complicated deliveries.

When we consider pregnancy outcome by age, we find that women between 20 and 24 years of age and women of 35 years and above suffered the highest proportions of negative outcome: 11.7 percent and 13.3 percent respectively. The only maternal death was to a woman of 24. Thirty-eight teenagers, six of whom were pregnant for the second and third time, did not suffer any losses (Table 3). Even when we considered age and parity simultaneously, we found that women in the 20-24 age group fared worse than teenage mothers for all parities (Table 4): the 24 year-old woman who died in pregnancy had a history of three n-dscarnages, had only one living child, and had been pregnant for the fifth time.

Socioeconomic characteristics did not make a difference to miscarriage rates (Table 3). As for stillbirths and early neonatal mortality, while literacy status and landowning status of the household had little effect, caste status and labour force participation of the women influenced perinatal mortality differentially. Women from the socially marginalised scheduled castes had lower rates of perinatal losses, and wage workers had lower rates than women who did not participate in the labour force. This contradictory finding may be related to the fact that nearly half the women from backward caste groups were first time pregnant (as against a quarter of the women from the scheduled castes) and the strong association between backward caste status and non-participation in the labour force. In other words, the observed differential by caste and occupational status might, in fact, be disproportionately constituted sample of backward caste

women who did not, due to their caste status, participate in the workforce. An alternative explanation would be that women, who are not income earners, although belonging to a higher caste, have poorer health status because their limited access to resource inhibits access to good food and health care. Probably both explanations are valid, especially in the light of evidence discussed below.

The fact that none of the first-time pregnancy teenagers suffered any losses while those in the 20-24 age group did, is rather puzzling. This was true irrespective of socioeconomic status. Whether or not the woman concerned was literate, participated in the labour force, belonged to the scheduled caste, or came from a landless or a landed family, did not alter the higher proportion of negative pregnancy outcome for women between 20 and 24, an age group considered to be the "safest" for childbearing as compared to younger or older ages.

Further probing suggested one possible line of reasoning. Teenage pregnancies had occurred to women who had been married for only a few months, and who subsequently returned to their maternal home for care during pregnancy and delivery. They were better cared for, and their health status was relatively better (controlling for other factors).

Women in their early twenties and pregnant for the first time had been in their marital homes for at least a couple of years. In this phase of their lives as daughters-in-law of the family, they are most powerless, having borne no progeny, especially sons, yet. They have little autonomy, and limited possibility for self-care and good nutrition.

An earlier study on health-seeking behaviour of women covering 26 of the 47 hamlets included in the present campaign found that women in this age group did not receive any health care when ill, not even from traditional healers or home remedies. This was despite the fact that about a third of them had been suffering from various reproductive healths problems such as infections of the reproductive and urinary tract. The main reason these women gave for not seeking medical help was that they did not want to complain about being unwell, lest it should be misunderstood by their in-laws, who may send them back to their parental home. Or, that they felt embarrassed to discuss their health problems with members of their marital families; and, did not have the autonomy to seek medical help on their own [20]. This was not the case with women in there thirties who typically had three or four young children, and whose illness disrupted the household routine considerably. They promptly sought medical help, especially if they were also wage earners.

We believe that women in their early twenties, for reasons mentioned above, begin their pregnancies undernourished, or are suffering from one or more

reproductive health problems, which have remained untreated. They are at high risk of a negative pregnancy outcome, especially in their first pregnancies. In other words, while antenatal care and institutional deliveries can save some lives, not much can be done by such interventions to prevent negative pregnancy outcome in women whose health status is poor to begin with. Even more importantly, women's health status is dependent crucially on their ability to take care of themselves; and this is related more to their power status within their families than to other attributes such as education or economic and social status.

Conclusions

The health education campaign carried out by RUWSEC, with a view to improving pregnancy outcome, may be deemed as successful in so far as it made an impact on women's health seeking behaviour.

The proportion of institutional deliveries doubled, from 22 percent to 45.5 percent. The rate of stillbirths and early neonatal deaths declined steeply from 38.7 and 43.3 per 1000 total births respectively, to 25.5 and 29.1 per 1000 total births. However, despite antenatal care, constant monitoring, immunisation and treatment for anaemia followed by delivery in a health facility a number of stillbirths and early neonatal deaths could not be prevented. Stillbirths and early neonatal mortality rates continued to be high when compared to rates quoted by other studies from India.

Women pregnant for the first time, and early twenties suffered higher pregnancy outcome than other age and parity groups, irrespective of their socioeconomic status. We believe this to be a result of their poor health status, related to their power status within their marital homes.

What we have learned from this campaign is that unless women's general health status is improved, and special attention paid to their reproductive health problems, we can achieve only limited success in preventing negative pregnancy outcome. More importantly, we know now that there can be no quick-fix solutions to women's health problems. As long as women are powerless to actively participate in self-care, their health status cannot be improved. Investing in the female child, and empowering women to take care of themselves and assert their right to better nutrition and health care, both long-term processes, are inevitable steps that are necessary for improving women's health.

References

1. Gopalan, C. and Naidu, Nadamuni: "Nutrition and fertility," *The Lancet*, 2: 1077-78 (1972).

2. Bakketeig, L. S. and Hoffman, H.: "Perinatal mortality based on birth order with cohorts based on sibship size," *British Medical Journal*, 2: 693-98 (1979).
3. Resseguie L. J.: "Influence of age, birth order and reproductive compensation on stillbirth ratios," *Journal of Biosocial Sciences*, 5:443-56 (1973).
4. Casterline, J. B.: "Maternal age, gravidity, and pregnancy spacing effects on fetal mortality," *Social Biology*, 136:186-93 (1989).
5. Pebley, A. R. et al.: "Intrauterine mortality and maternal nutritional status in rural Bangladesh," *Population Studies*, 39:425-31 (1985).
6. Shah U., Pratinidhi, A. K. and Bhatlawande, P. V.: "Perinatal mortality in rural India: A strategy for reduction through primary care," *Journal of Epidemiology and Community Health*, 38:134-40 (1984).
7. Voorhoeve A. M. et al.: "Agents affecting health of mother and child in a rural area of Kenya," *Tropical and Geographical Medicine*, 31:607-11 (1979).
8. Faveau et al.: "Perinatal mortality in Matiab, Bangladesh : A community-based study," *International Journal of Epidemiology*, 19:606-15 (1990).
9. Premananda, Bharati and Basu, A.: "Fertility, mortality and maternal anaemic status in a village population of West Bengal, India," *Annals of Human Biology*, 17:331-42 (1990).
10. MacLeod, Caroline L. (ed.): *Parasitic Infections in Pregnancy and the Newborn*, Oxford University Press, London, 1988.
11. Krbowless, S.: "Spontaneous abortion and the pathology of early pregnancy". In Jean W. Keeling (ed), *Fetal and Neonatal Pathology*, Springer, Veriag, 1987.
12. Bhatia, J. C. and Neumann, A. K.; "Social correlates of foetal mortality in rural Ghana," *Journal of Family Welfare*, 28: 46-51 (1982).
13. Kaur, Surjit *Wastage of Children*, Sterling Publishers, New Delhi, 1978.
14. Golding, Jean.: "Epidemiology of foetal and neonatal death" in Jean W. Keeling (ed), *Fetal and Neonatal Pathology*, Springer, Verlag, 1987.
15. Gunasekaran, S. and Kurup R. S.: "Ghandigram" in A. R. Omran and C.C. Standley (ed), *Family Formation Patterns and Health. An international*

collaborative study in India, Iran, Lebanon, Philippines and Turkey, World Health Organisation, Geneva, 1976.

16. Casterline, J. B. : "Collecting data on pregnancy loss: A review of evidence from World Fertility Survey," *Studies in Family planning*, 20:81-92 (1989).

17. United Nations: *Levels and Trends of Mortality since 1950*. A joint study by the United Nations and the World Health Organisation, Department of International Economic and Social Affairs, UN, New York, pp 60-62, 1982.

18. Bobadilla, J. L.: "The effects of family formation patterns and perinatal health". Technical Background Paper prepared for the International Conference on Better Health for Women and Children through Family Planning, Nairobi, Kenya, October 1987. Population Council, New York, pp. 13, 1987.

19. Potter R. G., Wyon J.B., New M. and Gordon J.E.: "Foetal wastage in 11 Punjab villages," *Human Biology*, 37: 262-70(1965).

20. Sundari, T.K.: "Social inequality and access to health: Study of a scheduled caste population in rural Tamil Nadu". Paper presented at the Workshop on Health and Development in India, National Council of Applied Economic Research and Harvard University Centre for Population and Development, New Delhi, January 2-4 (1992).

21. Sidhu, S. and Sidhu L. S.: "Pregnancy wastage in Scheduled Caste women of Punjab," *Annals of Human Biology*, 15:167-76 (1988).

22. Jindal, A.: "A study of genetic markers and reproductive performance among Dawoodi Bohras of Udaipur, Rajasthan". Unpublished Ph.D. Thesis, Punjab University, Patiala, 1978.

23. Registrar General of India: *Sample Registration System 1988*, Ministry of Home Affairs, Government of India, New Delhi, 1989.