



Research on Iron & Micronutrient Supplementation in Zambia

October 31, 1998

Conducted by PSI for LINKAGES

The following research was sponsored by the LINKAGES Project through PSI, and was conducted in June-July, 1998 through a joint effort with the Society for Family Health (SFH) Zambia and the National Food and Nutrition Commission (NFNC) of Zambia

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LIST OF ABBREVIATIONS

ANC	Ante-natal Care
DHS	Demographic Health Survey
IEC	Information, Education and Communication
MoH	Ministry of Health
NFNC	National Food and Nutrition Commission
OCs	Oral Contraceptives
PSI	Population Services International
SFH	Society for Family Health
WRA	Women of reproductive age

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I EXECUTIVE SUMMARY

There exists an excellent foundation for a widespread anaemia control program in Zambia. The vast majority of women receive ante natal care and some counseling on iron, folate and, less consistently, multivitamin supplementation. Knowledge regarding anaemia and, iron and multivitamin supplements is almost universal amongst women and these supplements are provided free of cost from public health centers. Unfortunately, consistent use of these supplements is rare for a variety of reasons.

The principal inhibiting factor from the consumers point of view are negative perceptions related to iron supplements, such as fear of babies with large heads and the consequent difficulties during delivery. No negative perceptions were found related to multivitamins. Side effects were also widely reported, with little or no counseling being provided to women. An additional factor related to side effects is the varied regimen being prescribed to women which may be leading to higher than necessary dosing. Generally, women's assessment of their risk of iron deficiency was low as were perceived benefits of iron supplementation. These factors indicate the need for implementing a comprehensive IEC strategy, which would go beyond improving knowledge to motivational messages, dispel negative perceptions and rumors, and improve the counseling knowledge and skills of health care workers.

From a supply side perspective there are a number of issues which require review. The most important are related to adequate availability of supplements and lack of uniformity in the available supplements and their regimen. Some pregnant women reported that they were not given any supplements because they did not need them, indicating that a policy of universal provision of iron supplements is not being followed. Pregnant women reported a much lower compliance level when given an insufficient number of supplements to last them till their next visit. In addition, stock-outs were reported by both pregnant women and health workers, and the findings indicate some leakage of public sector products into the private sector. Finally, there was general confusion, both amongst women and health workers regarding the type of supplements available and the recommended regimen. Currently, iron and folate are provided separately, and most people are receiving iron pills which need to be taken thrice daily. This would require a woman to take four pills daily. This indicates the need for a review of the supplements which are provided by the public sector and the desired regimen to determine if these could be unified to a one-a-day iron/folate tablet, as well as the logistics of making these available with fewer stock-outs.

While efforts to improve provision of iron supplements for pregnant women through the public sector would pay quick and rich dividends, it is unlikely that this would, on its own, be sufficient. Women need to improve their iron stores before pregnancy. In order to achieve this, and also to address other micronutrient deficiencies, the research indicates that a social marketing intervention for the promotion of multivitamins to women of reproductive age would support the program for iron supplementation of pregnant women.

Most women would consider purchasing supplements, particularly multivitamins. Multivitamins are perceived to improve appetite. This positioning, which would need to be refined, is still positive as it does not stigmatize pill taking. Current access is limited to pharmacies, which are few and far between, and an intervention to make multivitamins more accessible and affordable, while promoting their need, would greatly benefit the nutritional status of women in Zambia.

In summary, the efforts made to date in Zambia provide an excellent opportunity for taking this initiative further. With relatively little additional investment, and in some cases even cost savings, Zambia could

have one of the best micronutrient supplementation programmes in the developing world

II BACKGROUND

An assessment trip to Zambia by LINKAGES (including PSI) in 1997 found that the supply of iron/folate in health centers and pharmacies is quite high. Furthermore, about 90% of pregnant women attend pre-natal care. Seventy-one percent of these women have four or more prenatal visits during their pregnancy according to the 1996 DHS. Supply of iron/folate pills in public health facilities was considered adequate. Nonetheless, discussions with health center personnel and pharmacists revealed low levels of iron/folate use by women. Of those who receive pills, compliance is often believed to be a problem.

A comprehensive iron/folate distribution and IEC program is a priority of the MOH. The goal of this research was to determine whether a new product is necessary, if current products need to be better promoted, or a different approach would provide better results.

No recent nationwide data is available on the prevalence of anemia in pregnant women or other target groups. A study done in the early 1970s showed a "high" prevalence (of 40 to 60%). A more recent survey in Ndola province (1996) revealed a 34% rate of anemia (OMNI, 1996). Worm infestation and malaria are widespread and would, in addition to inadequate availability of iron in the local diet, be contributing to the suspected widespread prevalence of iron deficiency. The NFNC has completed the data collection for a national anemia prevalence survey, findings from which are scheduled to be available later this year.

LINKAGES, through its partner organization PSI and its affiliate in Zambia, the Society for Family Health (SFH), is keen to find opportunities to contribute to the MOH's efforts to improve the iron/micronutrient status of Zambian women. As there are many unanswered questions, LINKAGES put together a research protocol with their partner organization, PSI. Working in collaboration with the NFNC, this research attempted to investigate relevant issues which would supplement the data recently collected by NFNC, and which would lead to the identification of appropriate project strategies/activities. This research is specifically focused on the behavioral aspects of supplementation and the potential for social marketing and IEC interventions.

III RESEARCH OBJECTIVES AND METHODS

The objectives of this research were as follows

- To identify reasons for iron/micronutrient supplement usage and non-usage amongst Zambian women
- To identify compliance behavior amongst Zambian women who have used iron/micronutrient supplements and the reasons for the same
- To identify possible steps/strategies to improve compliance of the iron/micronutrient supplement regimen amongst Zambian women
- To identify possible steps/strategies to improve the iron/micronutrient status of Zambian women

Rapid appraisal/research techniques were used for this study for a number of reasons. First, a quantitative survey has recently been completed by the NFNC which will provide much of the prevalence, use and other quantitative data. The purpose of this research was to understand behavior dynamics and as a result the methods employed are qualitative in nature. A number of different techniques were used to meet different study objectives and also to allow for triangulation of results.

Interviewers, moderators and transcribers were trained during a two days session in Lusaka between June 18-19, 1998. Pre-testing of the discussion guidelines and other instruments was done as part of the training exercise. The research was conducted between June 20-30 in both the urban (Lusaka and Ndola) and rural (Petauke and Kazungula districts) sites. **Appendix one** contains the research protocol which was used for each of the activities described below.

1 Focus groups A total of 6 focus groups were held, 3 in Lusaka and 3 in a large village in Kazungula district (Southern Province). The following recruitment criteria were designated:

- a) Two focus groups of lower-income¹ women, aged 20-30, who report having complied with the regimen for iron supplements during their last pregnancy²
- b) Two focus groups of lower-income women, aged 20-30, who report having been irregular users of iron supplements during their last pregnancy
- c) Two focus groups of lower-income women, aged 20-30, who report being non-users of iron supplements during their last pregnancy

¹Lower-income in rural areas will be proxied with the woman's education level being no more than grade three. In urban areas, no more than grade five.

²Last pregnancy refers to a pregnancy within the last two years.

The research team faced problems recruiting women for the third criteria (c) and hence the definition for the term “non-users” was modified to include women who either did not use iron supplements or tried them for a short while and stopped using iron supplements during their last pregnancy. All six groups were held in the locations planned.

2 In-depth interviews

a) Mothers

16 in-depth interviews were held with mothers to determine factors which influence clinic attendance and iron/folate supplement intake related to clinic attendance and counseling. These interviews took place in the following locations:

4 Lusaka urban	4 Kazungula rural
4 Ndola urban	4 Petauke rural

In each site, recruiters were asked to identify 2 mothers who had visited public health facilities at least three times during their last pregnancy, and 2 mothers who report having visited a health facility less than three times during their last pregnancy. Although the 1996 DHS indicated that between 5-15 % of pregnant women attended antenatal care less than three times, it proved difficult for recruiters to find women who had visited public health facilities less than three times. As a result, the recruitment criteria for number of visits was dropped and a random selection of women was chosen. These women were found later to have a range of between 3-9 visits each. These interviews explored issues related to iron supplement intake, perceptions regarding its use and effectiveness, regimen followed and how this is determined, side effects and compliance, and access to/distance from health facilities. A total of 16 interviews were conducted at various sites, as planned.

b) Pharmacists

8 in-depth interviews were planned and held at pharmacies/drug stores to determine their existing level of knowledge, attitudes, perceptions, and beliefs regarding iron/folate, interest/willingness to stock and promote iron/folate, standard industry margins/discounts, their perceptions of consumer interest/limitations to using product, estimated volumes, currently stocked iron formulations, other products stocked which address fatigue, etc. Two interviews were held with pharmacists from each of the following locations:

2 Lusaka urban	2 Kazungula rural
2 Ndola urban	2 Petauke rural

c) General Store Shopkeepers

8 in-depth interviews were planned to determine shopkeepers level of interest in stocking general sale medicines (such as iron supplements and multivitamins) and their KAP regarding iron supplements. Two interviews were to be held with shopkeepers from each of the following locations

2 Lusaka urban	2 Kazungula rural
2 Ndola urban	2 Petauke rural

The actual number of in-depth Interviews conducted were 4, with general shopkeepers in the two rural sites, Kazungula and Petauke districts. The original study design intended that four urban shops would also be interviewed, but the urban interviewer visited only pharmacies and not general sales shops. The rural shops visited were not necessarily in the same villages where the other research components took place, but were the closest shops to these areas.

3 *Mystery client interviews*

Eight mystery client interviews were scheduled, however, only seven could be completed: three rural and four urban (the fourth rural interview couldn't take place due to the timing of the study and the limited number of days that antenatal clinics are offered in the rural area chosen).

Mystery client interviews were held with antenatal care health workers in hospitals and health centers to determine their level of counseling and experience with iron/folate. Interviewers posed as women who were 2-3 months into their first pregnancy.

2 Lusaka urban	2 Kazungula rural
2 Ndola urban	1 Petauke rural

4 *Meetings* The assessment team met with officials from the following agencies to discuss issues related to iron supplementation: National Food and Nutrition Commission (NFNC), UNICEF, Pharmaceutical Society of Zambia, a pharmaceutical distribution firm, and Medical Stores of Zambia.

5 *Literature Review* Review of NFNC study and comment on its implications for a potential iron/folate social marketing project.

IV SUMMARY AND ANALYSIS OF FINDINGS

A Focus Groups with Mothers

For some discussion topics, there seemed to be no variation in knowledge, awareness, or perceptions among the different groups (three levels of adherence, or urban/rural) Findings from those topics are summarized without differentiating the groups, however, for those topics of discussion where there seemed to be differences, those differences are summarized by the type of group The following sections summarize the discussions from all six focus groups

1 Daily preventive health behaviors

Women in all the groups mentioned that eating well (nutritious and clean food), keeping clean surroundings, bathing and keeping the body clean, and attending the clinic when one is sick are all behaviors that maintain good health Attending antenatal care was added to this list of healthy behaviors for pregnant women

“For one to be healthy, a lot of things are done such as eating well and ensuring that the food is clean If it is left-over food, it must be warmed before taking it And the body has to be kept clean by bathing ”

“ cleaning houses and the surroundings to avoid disease”

“ going to the clinic when you are sick”

“A pregnant woman has to eat good food, such as oranges, milk, bananas, vegetables, liver, meat, nshima- a variety of foods ”

“We go to the clinic for check-ups so that we know the position of the baby and how to look after ourselves during pregnancy”

It is interesting to note that in addition to the above, that the rural groups of “adherers” and “irregular users” both mentioned that they did home gardening and stressed the importance of using the income for buying things which promote better health (soap, beans, small fish, etc) and vegetables for maintaining general health This concrete action distinguished them from the “non-users” groups The urban group of irregular users highlighted the importance of learning and education as a means to promote healthy behavior

Analysis and Recommendations

The common list of daily preventive health behavior consists largely of practices which are considered “normal” Any effort to promote a multivitamin for all women of reproductive age (WRA) would need to position the product as an essential part of daily preventive health behavior, such as bathing or eating healthy foods While there is unlikely to be much perceived cost for say cleanliness, the fact that multivitamins require to be purchased may be a hurdle This could potentially be addressed by explaining the inherent cost of other preventive health behaviors (purchase of soap, more expensive foods, etc) and/or the value/benefit of using multivitamins

While this particular research did not explore any special health behavior during pregnancies (other than ante-natal care visits), it is possible that there are special care behaviors adopted during pregnancy which could provide a similar possibility for positioning the promotion of iron/folic supplements

2 Experience with anemia in pregnancy

Almost all women had experienced symptoms of anemia during pregnancy- sleepiness, laziness, and weakness - and almost all of them mentioned too little blood as one of the causes for these symptoms. Other common causes attributed to these symptoms were overwork, not having enough food, loss of appetite due to nausea, and “the pregnancy itself since you are sharing blood with the baby”. Illnesses such as malaria and worms were also mentioned as causes in the “adherers” and “irregular users” groups. The term “anemia” was generally not used (only mentioned by one woman) to describe this weakness or lack of blood associated with pregnancy. Nevertheless, prompted recognition of the term (“What do you know about anemia?”) was surprisingly high amongst women who were “adherers” and “irregular” users. Most of these women had heard the term and defined anemia as “lack of blood”. One group went on to say that “anemia” is *not only* suffered during pregnancy, but by men, women, and children who are not pregnant.

“Anemia is a consequence of not eating enough food. Also, it’s due to not eating enough food rich in iron.”

“It could also be because of eating too much soil. This develops into worms in the stomach which may be sucking blood.”

“(Laziness and weakness) is a normal situation in pregnancy.”

(Moderator) ‘You said during pregnancy you feel weak, lazy and dizzy. What do you call this condition?’

“There is no special name for it. We just say ‘I’m feeling bad’.”

(Moderator) ‘Have you heard of anemia?’

Seven said ‘yes’ and four said ‘no’. Those who said ‘yes’ defined anemia as “lack of blood in the body.”

When asked about common treatments for “anemia” or little blood in the body, there were a variety of responses including drinking lots of liquids, eating a good diet, or taking pills from the clinic. One traditional treatment for anemia which consistently appeared in this research as well as the research done by NFNC earlier in the year is the practice of drinking the water or tea from boiled avocado leaves (*kotapela*). All groups expressed some awareness of “red pills” or “ferrous” being for blood.

“We drink a lot of fresh milk since we have a lot of cattle here. Black tea will give you a lot of blood as well. We also drink avocado leaves (*kotapela*).”

(Moderator) ‘How do you treat lack of blood disease?’ “Drinking avocado leaves and drink fresh milk.”

“To address the problem, eating a lot of vegetables may help. Taking juice- any type of drink, not fruit juice in particular. It could be Fanta, Coke, or Jolly Juice.”

“To address the problem of anemia a woman must take the pills for blood, eat food rich in iron such as liver, vegetables, milk, groundnuts, oranges, and juice.”

“Pills given at the clinic can also be used to cure anemia.”

Analysis and Recommendations

Knowledge regarding too “little blood”, iron pills, and even anaemia is extremely high. Although, as would be expected, the depth of knowledge of “non-users” is substantially lower than those of “adherers” and “irregular users”. This is likely to be leading to a much lower personal risk assessment.

by “non-users” Equally important is the perception that weakness and laziness is associated with a number of causes - most of which are not perceived to be related to iron e.g. overwork and insufficient food Thus, it may be that “non users” feel that iron supplements are unlikely to overcome their problems In addition, given that iron pills are perceived as only one of several possible solutions (most notably avocado leaves), “non users” may be substituting the use of iron pills for more traditional therapies

It is, therefore, recommended that an IEC campaign to better educate people about the risks of iron deficiency is required, along with clear messages that iron is the most important cause of weakness, and that iron supplements are the simplest and best solution to overcoming this problem Similar considerations would need to be kept in mind in case a multivitamin is marketed Given that there is considerable information already available, such a campaign would need to focus on a few important facts and concentrate on providing strong emotive appeal personalizing the risks of iron/micronutrient deficiency

It would also be important to target traditional medical practitioners in the IEC campaign, both as a means of disseminating information (and perhaps the product) but equally (and perhaps more importantly) to avoid a backlash were they oppose and spread misinformation regarding iron and/or multivitamin supplements

3 Awareness of iron and folate supplements

All groups are aware to some degree of the pills that women take during pregnancy The three main types of pills which were mentioned, in order of most often cited, were ferrous sulfate (“red or dark pills”), folic acid (“yellow pills”), and multivitamins (pinkish) Knowledge of what the iron pills were for was high amongst all groups, with the principal reason given being “for blood” In general, the **adherers** and **irregular users** seemed more willing to talk about what they thought the pills were for even if their information was incorrect The **adherers** groups came up with a variety of comments

(Moderator) ‘What do you call the red tablets?’ “Ferrous ”

(Moderator) ‘What do you call the yellow tablets?’ “We call them folic acid ”

(Moderator) ‘What are the red tablets for?’ “ for giving blood for improving the strength of the pregnant woman to make the child grow healthy in the womb so that when he/she is born she does not suffer from diseases to prevent the mother from losing too much blood when giving birth”

(Moderator) ‘What about the yellow ones?’ “The same as the red ones but also to reduce blood pressure ”

“Red pills are for blood and the yellow pills are for appetite ”

(Note taker’s summary) “Iron pills can be taken when someone is sick, not necessarily during pregnancy If a child is sickly, for instance, he/she loses blood (Hb goes down) hence iron pills can be given Anybody, regardless of age or sex, can take iron pills as long as he/she has little blood ”

Similarly the irregular users explained

(Moderator) ‘What kind of pills do you take during pregnancy?’ “Some red and yellow pills

Ferrous and folic acid”

(Moderator) “Are there times during pregnancy when you feel you need iron pills?” “When you feel weak,” “When you are told by clinic staff that you have no blood,” and “When you have malaria ”

(Iron pills are given) “ to give strength,” “ to increase blood,” and “ to make the baby grow big and healthy ”

“A woman may take iron pills when she is sick, when she is feeling weak and dizzy ”

In contrast the non-users groups stated

“Yellow pills are called folic acid, but the red ones we don’t know We hear the red ones are for blood but we don’t know about the yellow ones ”

(Note taker’s summary) “All of them said they have never felt like getting (iron pills) They said maybe they need them but they are not sure

However, later in the discussion with the same group there were several relevant comments regarding the red pills

“To increase the blood of the mother and the child ”

“To make the mother and child grow healthy ”

“To make the child grow big ”

“The tablets are not for pregnant women only Those who are suffering from malaria and all those who don’t have blood are supposed to take them ”

Awareness of iron supplements and what they are for was greater than awareness of folic acid and its purpose Some women expressed that iron pills are not just for pregnant women, but can also be for anyone who is sick Folic acid pills were generally described as being for the “same purpose as the red ones”

By and large, all groups of women, rural and urban associate health clinics or hospitals as the place to get iron supplements Urban women were somewhat more likely to mention chemists or “buying” as a possible source, but only if the supplements were out of stock at the clinics

Rural

“We would go to the clinic of course The clinic is the only place which stocks them because the hospital is far in Livingstone”

“We always go to the clinic, but sometimes we ask from friends who have some ”

Urban (Note taker’s summaries)

“All of them get the iron pills from the clinic but if they are out of stock, they are given prescriptions Otherwise, they do not buy ”

“Sometimes pills are gotten from the chemists Mostly they get them from the clinic Only one said that she bought ‘vitamin’ pills from the chemist and that was for improving appetite ”

“All of the women agreed that they would go to the clinic if they thought they needed iron pills They do not go and buy the pills because they have to go the clinic for proper check-ups for them

to know what their problem really is ”

Analysis and Recommendations

Awareness of iron supplements, in one form or another, is extremely high. While the levels of knowledge regarding iron supplements were higher amongst users compared to non-users, it is interesting to note that despite reasonably high awareness amongst the non-users, this was either being “denied” or not being perceived as being reliable information on which they would act. Thus, there is clearly a need to emphasize messages relating to “motivation to action” in any campaign undertaken on iron supplements. It would also be worth investigating credible sources of information for the target audience, and using spokespersons or testimonials in such a campaign. Finally, given that there is considerable information on this issue already available with women, the IEC campaign should consider “modeling behavior” in their communications.

With regard to the current perception that iron supplements are found at clinics - this reflects the reality on the ground. Iron supplements are not yet available at retail stores and are occasionally purchased at chemists. Any social marketing initiative to add to the current distribution system will, therefore, need to highlight availability and stress the reliability of new outlets, as well as the ability to self-prescribe. Such an initiative will also need to be sensitive to how this will effect the current supply chain, by emphasizing that this will lead to incremental sales rather than cannibalizing into the existing public and private sector efforts.

4 Awareness of Multivitamins

Women in all groups were aware of multivitamins and most, even in the iron non-users groups, had taken multivitamins in the past. Some women said they had bought the multivitamins, but most said they had received them from the health center. The tablets were described as small and dark red/brownish or pinkish in color, and could be taken by any person (men, women, children or the elderly- not just pregnant women) to improve appetite. Women in all groups agreed that multivitamins are for those who are sick or who have lost appetite. One group mentioned the “preventive” benefits of taking multivitamins. The women generally seemed to have a positive opinion of multivitamins and did not think that they have any negative consequences.

“They are very good because they increase your appetite ”

“Multivitamins can be taken by anyone, that is children or elders when they are sick and have no appetite ”

“Multivitamins are good, especially for children ”

(Moderator) *Who takes multivitamins?* “Anybody. Men, women or children because they bring appetite ”

“Vitamins are good because they enable those that have no appetite to eat”

“There are no negative effects of taking a multivitamin, but if you mix them with the red and yellow tablets then you feel like vomiting ”

“They are also used for improving the skin texture and prevent colds ”

“They are very good to prevent *lusini* (lack of appetite)”

(Moderator's note) "As mentioned earlier there was a mix-up on which pills are "for blood" and which ones are "vitamins" After probing further it was actually realized that what they buy sometimes are the vitamin tablets for appetite But even vitamins it's rare that they are bought They usually get them from the clinic "

Another note-taker commented that "There was a mix-up on the pills for vitamins and the pills for blood Some said that the yellow ones are vitamins for appetite and that the red ones are for blood Earlier on (in the discussion), it was mentioned that black pills are also given to pregnant women at the clinic but nobody seemed to have received or taken them, hence the use for them is not known As for the other women, red pills are for appetite and the yellow ones are for blood "

Analysis and Recommendations

The existing knowledge and generally positive image of multivitamins is a surprising, but extremely welcome finding Meetings held later with the Medical Stores confirmed that there is a large supply of multivitamins currently being provided to health centers The lack of confusion and myths related to multivitamins provides an excellent opportunity for an intervention to address anaemia (as an add on to the iron supplementation program during pregnancy) and other micronutrient deficiencies prior to pregnancy by promoting multivitamins to all women of reproductive age Since iron status at the beginning of pregnancy is the key determinant of iron status at delivery, such an initiative would perfectly complement public sector efforts The perception that multivitamins are supplied largely by clinics remains to be changed, but on the whole multivitamins seem to be more linked to commercial sale/purchase than iron supplements

5 Barriers to taking supplements

The barriers to taking iron supplements which were revealed in this research were consistent with the findings of NFNC's qualitative study earlier this year The main side effects which were mentioned were vomiting, nausea, dizziness, stomach pains, and black stools Apart from the side effects, women also feared miscarriages or delivery complications if the baby grew too big, and often cited this reason as more important than the side effects Other barriers mentioned were that the number of pills that have to be taken are too many, and the "bad smell" of the pills themselves As expected, these barriers seemed to play a stronger role in the decisions of the **non-users** and **irregular users** group than in the decisions of the **adherers** group

Non-users

"Some of us when we tasted the pills we started vomiting"

"(supplements) given at the clinic but they don't tell us how to avoid side effects Even when you go back they just say "continue taking"

"Pills cause women to have miscarriages"

(Note taker's comment) Their parents stopped them by giving them the reason that pills spoil the growing baby which may lead to miscarriages or still-born births Others could not take the medicines because their parents stopped them by giving them the reason that pills lead to miscarriages and stillbirths "It is not that (the women) have had such experiences but they just hear such stories

Irregular users

“Vomiting whenever you take the pills ”

“The child grows very big, which may pose a problem when giving birth”

“The tablets are too many It becomes boring taking two or four tablets each day for as long as you are pregnant ”

“The smell is bad, especially the red ones ”

(Moderator) “Did you do anything to lessen the side effects?” “Some of us just stopped taking ”

“(went) to the health center and was advised to continue taking the pills because she did not have enough blood ”

(Note taker’s comments)

“Most important of all is that iron supplements make the growing baby in the stomach big, especially the head such that it becomes difficult for a mother to deliver ”

“Some women had to discontinue taking the pills because they were eating too much and that was a problem due to the insufficient food supply in their homes ”

“Women did not stop taking the pills because of the effects such as nausea and vomiting, but because of the ‘general view’ that iron pills makes the baby grow ‘big’ ”

Adherers

“There are no side effects, the tablets are just OK ”

(Note taker) “The majority said that they did not experience any problems after taking the pills Two of them said the pills made them feel lazy and hungry ”

Another barrier to taking supplements regularly may have been availability of tablets at every visit This issue is discussed later in the **Supplementation Regime** section of this focus group summary, and also in the mystery client interviews Among both rural and urban groups, women claimed that distance to the clinic was *not* a barrier to getting the supplements, even in rural areas

“The distance is not a problem, as all of us live near the clinic At most we take two hours to walk”

“It is only 3 kilometers away, which is not that far”

Analysis and Recommendations

There are a number of physical side effects and beliefs/myths which hinder proper compliance Part of the problem related to side effects may well be due to the supplement and regimen being used which need to be reviewed and possibly modified Increased/improved counseling at the time that pills are dispensed at the clinic would also avoid some of the discontinuation The interpersonal communications component of any IEC campaign on iron supplements should include a component on preparing women for potential side effects and how best to deal with these Given that occasional/partial use of iron supplements is widespread in Zambia, the need to model behavior which encourages continued usage and its benefits is critical to the success of this initiative Equally, if not more important, is the need to

dispel rumors and myths related to continued use of iron supplements. It is most likely that a strategy which directly addresses these fears, which would fit in well with the use of credible personalities in a campaign, is likely to be more successful than indirect means.

Finally, the response on convenience of clinics seems to be a cultural issue, where an hour or two's walk is not considered to be an inconvenience. This depends somewhat on the context - it is "not far" for a clinic but what is considered "far" for a shop, is likely to be a smaller distance. This issue needs to be further explored in any future research. For context, it is interesting to note that the distance of the clinics is an issue when they run out of pills before the next scheduled visit, and this is dealt with in greater detail in the supplementation regime section. The findings of later sections also reveals that adherence is directly related to the availability of supplements and a regular supply of the required number of pills is often not available at health centers.

6 Enablers for taking supplements

Among **irregular users** and **adherers**, enablers for taking the pills included the beliefs that taking the pills made them feel stronger and healthier, during pregnancy and after delivery.

Moderator Why did you want to take the iron pills during pregnancy? "To increase blood and reduce weakness," "To prevent weakness after delivery," and "To reduce high blood pressure." "We lose a lot of blood when giving birth, hence we need supplements."

However, among **irregular users**, the enabling factor of perceived benefits was qualified by other concerns to taking supplements (as discussed above) and further demonstrated in additional comments.

(Note taker's summary) "One woman claimed that the pills helped her because her blood level increased. But she only took five pills and gave away the rest for fear of having a 'big' baby." *(Moderator)* Did you want to take them? "Yes, we did, but for fear of the already explained reasons we took them very irregularly. Also the prescription is too much" (the pills are too many to take).

(Moderator) Did you do anything to lessen the side effects? "we tried to take with something else other than water. Also we changed the time of taking to sleeping time so that whenever those effects come you are already sleeping."

(Moderator) Do you think that the pills helped you? "If you have no blood, there is great change (after taking the pills) because you become healthy and strong." "Also when you don't finish the course, you become ill frequently."

Analysis and Recommendations

Given that a large majority of women in Zambia have at least a few iron pills during pregnancy, the principal enabling factor is their promotion through health centers.

The regular use of iron pills seems to be self-propagating. The more regularly it is used, the more likely that benefits are perceived and the pills continued. The strength of the positive beliefs of the adherers indicates that if others are motivated to continue with the regimen for longer periods of time then they are more likely to overcome their other concerns. Having said that, concerns such as fear of a large baby

also need to be addressed directly. Finally, the comment on decreased well-being after finishing the course, provides added weight to the case for promoting a multivitamin for more sustained use.

7 *Supplementation regimen*

When the supplementation regime that is recommended varies from woman to woman, as does the number of pills that each woman is given at antenatal care visits, the issue of compliance becomes difficult to define. It seems that the recommendations from health workers vary greatly.

Adherers

“Given 50 pills once and finished them 1 x 3 per day”

“1 x 2 times per day until they finish for the red ones. Even the yellow ones, it is the same 1 tablet x 2 per day”

“I was given 36 pills”

(Moderator) “Do you follow the health workers instructions?” “Yes, but sometimes it is not possible but you always aim at finishing the tablets” “We try to find the best time of the day to take e.g. when going to sleep or when having breakfast or during lunch” “The pills smell so one takes them when going to sleep”

(Note takers comments) “The pills were not given throughout pregnancy but whatever quantities they were given they finished. Majority were asked by clinic workers if they had finished the pills, checked their Hb but not given some more”

Irregular Users

“1 x 3 per day for both folic acid and ferrous”

“1 x 2 per day for both folic acid and ferrous”

“1 x 1 per day for both folic acid and ferrous”

“Instructions are sometimes followed and sometimes not”

“Followed at first but later modified to suit your feelings”

“Sometimes you start taking the pills after breakfast or when going to bed”

(Note takers comments) “Some were given 12, others 8 pills, 9, 10, 20” The majority said they were told to take 3 times a day, others took 2 times a day - different answers were given

Non-users

“Some of us were given 18 for both folic and ferrous sulfate, but were told to go back in case they finish”

“Told to take 1 tablet 2 times a day - the tablets were supposed to last until the next visit”

“We keep quiet and pretend that we are taking the tablets”

“We don’t know”

Analysis and Recommendations

It is obvious that there is considerable confusion regarding the supplementation regimen, both in terms of the instructions received and how they were followed. It should be kept in mind, however, that the two

major types of iron supplements distributed to public health facilities include a 200 mg and a 50 mg formulation. Nevertheless, one would expect the respondents of one particular group, going to the same clinic, to come back with the same dosage instructions. The confusion surrounding dosage is further corroborated through the mystery client interviews and there would seem to be an urgent need to review and unify the procurement and prescribed regimen of iron pills available through the public health system in Zambia. Further information on the exact formulations and protocols for iron, folate and multivitamins needs to be collected from the concerned authorities.

The adherers have their own definition of “adherence” which mostly relates to finishing the pills rather than taking them as prescribed up to the end of their pregnancy. Clearly, most of them did not take iron supplements throughout their pregnancy even though they regarded themselves as adherers - and they did not take them throughout largely because they were either not asked to, or were not given more pills at the health centers. It is interesting to note that adherers claimed to have received a much larger number of pills (at one visit) than the irregular users. Receiving only an average of 10 pills, as reported by irregular users, would require them to visit the clinic more frequently - and is likely to be resisted if it is only for the purpose of getting pills (as opposed to a general check-up on the pregnancy). There are at least two possible solutions - to make the pills available more conveniently and to try to ensure that health workers give sufficient pills to last until the next scheduled visit.

Earlier recommendations related to IEC for motivating and modeling behavior to ensure correct compliance is relevant to this section as well.

8 Purchasing behaviors/willingness to buy

Women discussed their willingness to buy a multivitamin or an iron supplement instead of getting them free from the clinic. In general, it seemed that women would only buy a multivitamin or iron if they perceived that it was to “cure a disease”, but they would not be as willing to buy if they thought the pills were just for prevention. Most agreed that they would not be willing to buy something if it was available for free at the clinic, but some reasons were given for having bought multivitamins in the past or being willing to buy them in the future. In general, **irregular users** and **adherers** seemed more willing to buy than those women who **non users**, and **urban** women seemed more open to the concept of buying supplements than **rural** women.

Non-users

“Since we don’t take them, we do not even bother to find out whether they are available elsewhere apart from the clinic.”

“(I wouldn’t buy) unless it was for saving a life. If the nurse prescribes, we would buy, but they should be for curing a disease.”

“If the medicines/pills were prescribed, maybe we can buy (*note taker commented that this was said with reluctance*). It is easy to buy Panado and Cafemol because we are very familiar with their uses.”

Irregular users

“If they are cheap and prescribed by a clinic staff, yes. Otherwise since they are available in

clinics, there is no need to buy them ” (**Rural group**)

(Note taker) “Multivitamins are sometimes bought if they are not in stock at the clinic rather than waiting (to see if) there’s another consignment at the clinic It is not good to queue-up just for vitamins at the clinic, hence they would rather buy from the chemist instead of wasting time at the clinic Besides, they have to use schemes (pay fees at the clinic) ” (**Urban group**)

(Note taker) “The majority do not buy such pills but it’s easier for them to buy medicines like Panado (pain killers) Those that bought vitamins before bought for children or the sick so that they could have appetite ” (**Urban users group**)

“Pills for blood (iron) should not be sold (instead of given for free) because they are for curing a disease and it can create a lot of problems when one is sick and has no money (one should be able to receive them for free) Unlike contraceptives, which are for prevention ” (**Urban group**)

Adherers

“No (I don’t pay) because the clinic stocks them If you run out in the middle of the month, you still go back to the clinic The pills are readily available in the clinic ” (**Rural group**)

“We would buy as long as they are not available in the clinics ” (**Rural group**)

“Money in villages is difficult to get so we may not manage So in sickness we may buy, but it is difficult to buy when you are feeling normal ” (**Rural group**)

(Note taker) “They can buy if the pills (iron) were not in stock at the clinic on the condition that they are given prescriptions, and also multivitamins for appetite can be bought The question of selling was not welcomed The majority said that they take them for free from the clinic They do not have money but if the clinic runs out they can buy because the pills help them ” (**Urban group**)

“Anyway (regardless of the price) we can buy them, because when one is sick, there’s no way out- they help us ” (**Urban group**)

Analysis and Recommendations

Even though the concept of buying tablets *instead of* getting them for free didn’t seem to be popular there is a mixed response regarding the willingness to purchase It is apparent that all women will not purchase, but with an appropriate strategy it is likely that increasing numbers of women could use private sector pills as a complementary or even primary source of both iron/folate and multivitamin supplements A few groups compared buying iron supplements to buying oral contraceptives A comparably priced iron and/or multivitamin supplement, between Kwacha 500-1,000 (that is positioned as a follow-on to OCs, once a woman ‘decides’ to become pregnant), may have a considerable market for a number of reasons (better product, more attractively packaged, more conveniently available and aggressively marketed)

Another important finding is that women believe that supplements require prescriptions and perceived them to be a ‘cure’ for a health problem It would, therefore, be important to either (or both) ensure that a socially marketed multivitamin has the support of health providers and/or is positioned as a “familiar” (self prescribed) product, like Panado, which people can and do purchase on the basis of their own perceived need

The frequent comments on stocks being unavailable at the clinics is indicative of many focus group members having faced this situation and the need to improve the logistics of iron supplies and/or

supplementing current efforts with widespread availability through the commercial sector. This issue is discussed in more detail in the section on mystery client interviews.

9 Opinions of current product characteristics

In general, the current iron, folate and multivitamin supplements are acceptable to women in terms of packaging, size and color. Current product characteristics didn't seem to be explored in depth in any of the focus groups, most women seemed to respond without strong opinions to this line of questioning ("Color is okay, taste is okay, packaging is okay, size is okay")

Discussions about the taste and smell of the tablets confirmed that coated tablets are more acceptable than uncoated. Women frequently complained that the smell of the iron pills was bad, but one woman described the taste as "sweet" (presumably coated). The general consensus seems to be that the current product (iron supplement) that is distributed through the health center is more or less acceptable.

"They are parceled in any rough paper and it doesn't matter. What we are interested in is the tablets."

"They both (red pills and yellow pills) have a bad smell but the red ones are worse. The color is OK and the size is OK as well."

"The smell is not nice, but the size is OK and the packaging is OK. Instructions are written on the packs. Sometimes the pills are in plastics and sometimes in paper packs."

Analysis and Recommendations

The line of questioning did not try to compare the product characteristics/quality to pharmaceutical products which are purchased. Currently available supplements may be the only way that they know that public health products are made available, and future research should try to compare product characteristics of those supplements available through the public sector with commercial products.

10 Media access/sources of information

Consistently, across all groups, radio is the most commonly accessed form of media, and programs in local languages are the most popular. Mealtimes and after the evening meal are popular times to listen to radio, and news and drama programs seem to be the most popular. Printed materials and newspapers are not read by women in general, and watching television is not common. Women consistently report that health workers are considered the most reliable source of information on health and nutrition.

Rural

"We rarely read printed materials here. Newspapers take long to reach here."

"The old newspapers are sometimes found but not often. Mostly only English versions such as the Daily Mail and Times of Zambia."

"Most of us listen to radio. Those who don't have (a radio) listen to their friends' radios. News in Chitonga (the local language) is very popular. Also programmes that come after supper are

very popular ”

“There are few radios in the village but most of us do listen to them from friends Chitonga programmes are very popular, and news is also very popular ”

“The best time to listen to the radio is in the evenings ”

“Printed materials are not easily available apart from old newspapers which are also very rare ”

Urban (Note taker’s summaries)

“The majority listen to the radio either in their homes or from neighbors some listen to the radio every day, anytime they are free They showed no interest in reading by giving the excuse that they are busy and as a result they do not have time to sit down and read However some information on health issues is heard from the radio and also there are materials at the clinic on STDs but (the women) do not read them Having asked the women about the programmes they like listening to, it can be concluded that health issues information do not really attract much attention They like listening to drama programmes as well as stories from the home service station (Radio One) and music ”

“ they usually listen to the radio during meal times (‘morning, lunchtime, and in the evening’)

The popular programmes that they listen to are drama stories and just music from the home service (Radio One) All the women in the group do not read any material ”

Analysis and Recommendations

It seems that even urban women do not depend on television or newspapers as a main source of information Although these media are more likely to be present than in rural areas, the interest and availability (in these lower-income groups) seemed no greater This would suggest a communications strategy which focuses on radio and interpersonal communication for reaching this target group It should, however, be kept in mind that secondary audiences e.g. influencers, such as pharmacists (see section on interviews with pharmacists), health providers, and others would be accessible through television and the press

B In-depth Interviews with Mothers

Sixteen in-depth interviews were conducted (four at each site) with women to determine factors which influence clinic attendance and iron/folate supplement intake related to clinic attendance and counseling. Most women reported that they had attended ANC 5-7 times. The fewest times visited by any mother was 3, and the most was 9 times. Of those who visited “fewer” times (3-5 visits), no differences were observed in comparison to those who visited “more” times (6-9 visits), in terms of reasons for attending antenatal care and iron/folate intake related to clinic attendance and counseling received.

The question guides for these interviews (see Appendix one- Instruments) were designed to cover topics which would cross-check the information that was collected in the focus groups with women and the mystery-client interviews.

1 Access to health centers

All urban mothers reported that they lived within a 20 minute walk of the nearest health center. This distance did not seem to be a problem for any of these mothers in terms of accessing antenatal clinics. In rural areas, women lived farther from the clinic, most reported that they were about or within an hour or two’s walk from the nearest health center or outreach center. However, most of these women didn’t feel that the distance was a problem in accessing antenatal care (“not very far”, “within reach of the village”).

Analysis and Recommendations

Distance to the clinic is clearly not an issue in urban areas, although the results may have been somewhat biased by the fact that the interviewers were all public health workers and often interviewed at the site closest to their contact health centers. In rural areas, the overwhelming perception is that distance is not a problem, although this is with reference to attending ANC and not necessarily for supply/purchase of a daily supplement.

2 Antenatal care attendance

As mentioned above, most women reported that they had attended ANC 5-7 times. The fewest times visited by any mother was 3, and the most was 9 times. The number of antenatal visits made by rural women was similar to that of urban women, the greater distance to the clinic does not seem to prevent rural women from seeking antenatal care. Most women felt that antenatal care was important in that it allowed a woman to know if she and her baby were healthy, and gave her an opportunity to be treated if she had a disease or if she was feeling sick. One rural woman mentioned that the main reason they go to antenatal care was not to know about their health, but to avoid being treated poorly by health staff during delivery. “It is important to go because if you abscond (from antenatal attendance) then they treat you poorly during delivery.”

In general, women consider 2-3 months into a pregnancy to be “a good time” to begin antenatal care, although most report that they began around 5 months in their last pregnancy. This discrepancy might be explained if the women thought they were being “tested” by the interviewers for “correct answers”, if they perceived the interviewers to be health workers. Also, some women gave the explanation that they had been sick earlier in pregnancy and were not able to go to ANC any earlier, others said they did not realize that they were pregnant.

The general “procedure” that was reported for antenatal care visits included things like taking blood pressure and weight measurements, palpating of the stomach, receiving pills, being given an appointment for the next visit, blood drawn to test for anemia and STDs, receiving a tetanus vaccine, and being told how to care for oneself during pregnancy and prepare for the baby

Analysis and Recommendations

Attendance for ANC in Zambia is exceptionally high for a developing country and the concerned authorities can take pride in this achievement. The general perception is that ANC visits help ensure the birth of a healthy child and women are willing to make multiple visits to achieve this outcome. A cause for some concern, however, may be the interpersonal skills of health workers. There are additional comments in other sections which indicate that some workers may be heavy handed and authoritarian in their dealings with clients. This perception may, in part, be due to the rush of women that come for ANC, notwithstanding which it is recommended that refresher training for health workers include a client service orientation, and that the MoH may even consider events such as “Politeness Week” to promote this change in attitude.

An interesting finding was the general awareness that the first ANC visit should take place in the first trimester and how little this translated into actual behavior. The need to go beyond knowledge to motivating behavior is key to these health interventions.

3 Provision of supplements

Most women reported that they were given some combination of “red”, “yellow” and/or “brown/pink” pills (iron, folate, and multivitamins). The women seemed to be generally aware that the pills were to “increase blood” and “improve appetite”, and for “general good health”. Those who were not given any supplements during their pregnancy were aware of the supplements (color and purpose) from friends or relatives who had taken them. In some cases the women were told by the health workers that they did not need the supplements because they did not lack blood, in other cases the women were not given and “didn’t think to ask”.

Those who received the supplements reported various prescribed regimens, usually one or two pills daily until they are finished. Some women received as few as eight of each tablet per visit, and others received thirty, or reported that what they were given “was adequate” to last until the next visit. “At times I was given a month’s supply when they had enough in stock, but sometimes I was given for only five days”.

From what the mothers reported, it seems that advice is rarely given on what to expect when taking the supplements e.g. side effects and ways to cope. Many women said that they were not told what to expect (apart from having increased blood and improved appetite). Only one woman said that her health worker advised her that she may feel nausea from taking the supplements, and to avoid this she should take them with meals and at bedtime. It seems that counseling on side effects is not regularly given.

Analysis and Recommendations

The findings from this section are consistent with the focus groups. Knowledge of supplements and their purpose was almost universal amongst the responders. This is extremely encouraging and again points to the excellent work done by the health care system in promoting use of supplements. Nevertheless, it

would seem as if the current protocol being followed does not require blanket prescription of iron supplements for pregnant women and this policy needs to be reconsidered. The advantages of a uniform regimen and pill/s also need to be reviewed. The number of pills given out and the lack of continued, regular provision of supplements to expectant mothers, is indicative of frequent supply shortages. Finally, there would appear to be a need to improve counseling.

4 Perceptions related to iron supplements

Contrary to the findings of the focus groups, none of the women interviewed reported having had side effects from taking the supplements. Women consistently said that they *did* think they had needed the supplements because they had previously felt weak, tired, dizzy, or had headaches in their pregnancies. In general, the women felt that the supplements had helped them with these problems and in some cases, had also improved their appetite and helped them to gain weight. This contradiction with the focus group findings may be the result of the different dynamics of a group discussion as compared to that of a one-on-one interview. Women may have been more likely to “voice their grievances” (side effects and negative experiences with supplements) in the “safety” of a larger group of peers. Regardless, the positive perceptions about iron supplements are supported by the following:

“I felt better after taking iron pills. The headaches stopped, I also stopped vomiting and I developed a very big appetite.”

“I felt I needed blood pills because I was feeling dizzy. When I took the pills I felt better and stopped feeling dizzy.”

(Interviewer’s notes) “She felt the pills were important during her pregnancy because she used to feel weak, but after taking them she felt stronger.”

The women who *did not* think that they needed iron supplements during their pregnancy said that they had not experienced any sickness in their pregnancies, so they did not feel that they need the supplements. This perception is consistent with the findings of the focus groups, that iron pills are perceived as treatment for some ailment or sickness, but not as something that one would take for prevention.

“I didn’t feel like needing iron pills since I knew I had enough blood, and I thought they were not important unless I did not have enough blood, or if I was sickly.”

“I only felt that I needed iron pills during my pregnancy when I had malaria, but did not feel like (I needed them) when I was feeling well. Because I was not told that (I was sick) or felt ill for me to need iron pills.”

Note takers comments, “She reported not having been given any pills of any kind even during her first pregnancy. She said other women were given some pills for blood when they were found to have not enough blood.”

Analysis and Recommendations

Iron supplements had a positive image amongst responders in the in-depth interviews, and there were no reported side effects. Despite this reportedly favorable image, there were a number of women who had never taken iron supplements largely because they thought they did not need them. It is recommended that uniform supplementation for pregnant women should be considered in order to avoid this confusion.

5 Compliance

Women commonly reported that they had taken the pills as the health worker had prescribed, and that the pills were always available at the clinic. Again, this information is contrary to the findings of the focus groups, although more detailed probing did later reveal different levels of compliance

“The pills were always available whenever I visited the clinic, and I was taking them as was instructed ”

“The pills were always available except once in a while I was given one type only ”

“At times I was given a month’s supply when they had enough in stock, but sometimes I was given for only 5 days ”

“I was told to take one tablet of each at bed time and she gave me pills to last 10 days”

“The pills lasted for one week only but everytime I went to ANC I was given the same amount ”

“(They were) not all the time available, so my husband used to buy me the yellow pills ”

A few women discussed the compliance issue in more depth and explained if and why they had modified the schedule. These findings were somewhat more similar to the focus group findings on compliance issues

(Interviewer’s notes) “She tried to follow instructions but some days she would forget, so she ended up jumping some days ”

(Interviewer’s notes) “She used to skip some times and then gave the remainder to a friend who didn’t have- she didn’t complete the ones given because she was worried about the rumors- but made no efforts to find out from the clinic because usually the Health Center staff do shout at them so she just brushed off the fears ”

“I didn’t follow the schedule as directed instead I was taking one pill once a day because they made me feel very hungry every time I took them ”

Analysis and Recommendations

Although initial responses were positive in terms of following the prescribed regimen, further probing revealed similar issues/problems to the focus group findings. Availability of the pills, forgetfulness, and myths such as the fear of large baby and too much appetite were the stated impediments to better compliance. Specific recommendations for compliance issues are given in the focus group section above

5 Iron supplements and Multivitamins

The general perception of both iron supplements and multivitamins is that both can be for everyone, but are especially good for pregnant women and children. There didn’t seem to be any strong negative perceptions, although some women mentioned that they had heard that with iron some people have nausea or fear big babies. Consistent with the perceptions found in focus groups, and the counseling given in the mystery client interviews, iron is “for blood” and multivitamins are “for appetite”

In terms of purchasing behaviors, common medicines bought are usually Panado and chloroquine, or cough medicines. Urban women seemed familiar with both iron supplements and multivitamins, generally having seen both in shops. These women consistently said that they would buy iron or a

multivitamin if not available in the clinic or *if advised by a health worker*, but “not on my own”

Rural women seemed less sure of any “differences” between iron and multivitamins. These women also seemed less comfortable with the concept of buying supplements, perhaps because of the distance to “pharmacies” where most medicines are currently sold

“She is not thinking of buying them since she doesn’t even go to town to buy anything ”

(Interviewer’s notes) “Shops are in town about 60 km away. She would not ask for or buy folates, iron, or multivitamins in a shop because she is afraid she might not know how to use them well ”

(Interviewer’s notes) “She says she can buy vitamins for health but not irons and folate unless she is very sick. Both husband and wife can buy especially vitamins if they are affordable ”

“If I don’t have blood and need vitamins and am told by the clinic to buy these pills I would because I would like to stay healthy. I am the one who buys- my husband gives me money if I need to buy anything since the shop is within the village. Unless it’s going to the boma, then my husband goes ”

Analysis and Recommendations

As in the focus groups, multivitamins had a somewhat more positive perception - at least in so far as there were no negative myths associated with it. There was also a greater willingness to purchase for multivitamins, perhaps, in part, due to the more medical perception of iron/folate and the more general good health perception of multivitamins. If multivitamins were to be social marketed then this image should be reinforced.

6 Access to Media

Radio was considered a common and reliable source of information for health issues, even if that is not the primary reason one listens to the radio. Women cited examples of why radio is a good source of information.

“They say it slowly so that you can write it down if you want. When there is cholera you can know where it is all the time ”

“I like listening to Radio One, there is a lot of educative broadcasts on how to look after a sick child, or how to feed a sick child ”

Urban women were more likely to mention television as another reliable source of information. Rural women mentioned that health workers were the best source of health information because “they are the ones who are trained in issues of health ”. However, one woman stated that “the clinic could be better, but the people there- no confidence in them, they just like shouting at us ”. Women also mentioned elder family members and churches as good sources of information on health issues.

Analysis and Recommendations

Given the consistent mention of radio as a primary source of information, IEC campaigns should use this as their lead channel of communication. Health workers have been consistently mentioned as important sources of health information and would need to be targeted as the primary audience for

interpersonal communication Finally, other important target audiences to incorporate in an IEC campaign would be influencers such as elders and religious leaders

C Mystery Client Interviews

The purpose of these interviews was to collect information which could be compared to the responses received from mothers relating to the level and quality of counseling that is provided at antenatal visits regarding nutrition during pregnancy and iron/folate/multivitamin supplementation. It also provided an opportunity to experience and record first-hand information regarding the above information.

“Mystery clients” were asked to present themselves in the clinics as 2-3 months pregnant (first pregnancy), and were given a “checklist” of topics for which they were supposed to note (after completing the interview) the health workers unprompted advice. The “mystery clients” were instructed to probe for advice on topics which the health workers did not provide on his/her own by referring to the experiences of an elder sister. The checklist which they were given (see Appendix 1) was to be completed as soon as they exited the clinic, and they were asked to note whether each piece of advice had been prompted (P) or unprompted (U).

The amount of information that was recorded after these interviews was not detailed, however, it did provide insight to current practices in health centers related to iron, folate and multivitamin supplements.

Out of the seven antenatal clinics visited, four did not give any kind of supplement to the clients. Of these four, two said that they were out of stock but advised the client to buy iron and folate from the chemist (after probing). One health worker told the client that it was too early in the pregnancy to take supplements. Another (the fourth) health worker told the client (when the client probed) that she had no signs of anemia so she should take nothing. The client continued to probe and was told that “I should not listen to stories from other women. That is why she was checking me, if she saw need she would have prescribed and given iron, folate or vitamins. They only give to those who look pale.”

Of the three clinics that did give supplements, the recommended pill and regimen varied considerably. One clinic gave multivitamins (30 tablets with instructions to take 1-2/day for 5 days), folic acid (30 tablets with instructions to take 1/day), and iron tablets (60 tablets - of two different sized pills - with instructions to take 2/day) to last for one month until the next monthly visit (appointment was given for one month later). Another clinic gave 14 tablets each of iron and folate, with instructions to take 1 tablet/day of each. The client probed regarding the number of tablets she had received and was given a second package of 14. The third clinic “didn’t count (iron tablets), just scooped several and packed in a piece of paper and told me to take every day.”

All mystery clients were advised to return for another visit after one month’s time, and an appointment was given. Counseling on what iron, folate, and multivitamins are for was provided only after prompting and was consistent with findings of the focus groups i.e. for blood and general health. In cases where the interviewers probed the purpose of each supplement (only in one case the information was given unprompted) they were told that iron and folic acid are for blood, and multivitamins are for appetite.

Although the level of probing by the interviewers was not as extensive as it could have been, much of the information obtained was through probing, and was not offered without prompting. Counseling on possible side effects was never given unprompted. Three health workers were prompted, of whom two did not provide any advice while the third suggested that she stop taking them if they made her feel nauseous.

Analysis and Recommendations

There was a general impression that the health workers are rushed and do not have the time for explaining or counseling. There are reportedly long queues on the days that ANC is scheduled and this is a key finding which has important implications. With the increasing emphasis on integrated programming it will be important to ensure that additional responsibilities for health workers take into consideration existing workload.

Recommendations based on findings from the focus groups and in-depth interviews with mothers were largely supported by the findings from these interviews.

- a) The issue of ensuring a regular supply of supplements to avoid stock outs at clinics need to be addressed. This could include improving the logistics of the public health system and/or complementing availability of supplements at clinics by making them more readily available through the private sector. The latter option could be supported through the public health system in a number of ways - either through direct procurement by District Health Management Teams of private/socially marketed brands to supplement the supplies by the Medicines Board, and/or promotion of socially marketed brands by health workers.
- b) Unifying the supplement/s available and provided through the public health system, particularly in the area of making a single daily dose, single pill for both iron and folate available.
- c) Health workers require refresher training on counseling and their role as the principal providers of information on supplementation supported through a comprehensive IEC campaign.

D In-Depth Interviews with Pharmacists

In-depth interviews were conducted with eight pharmacists representing all four of the study sites (two rural and two urban)

1 Business and customer profiles

Rural-pharmacists who were interviewed had lower levels of education (2 year degrees in various fields such as pharmacy technology, dispensary assistant, etc) compared to the urban-pharmacists who were interviewed (all had Bachelors degrees in Pharmacy) Rural pharmacists reported that business fluctuated throughout the year according to the harvest (customers buy more during the harvest season) or how well nearby hospitals and clinics were stocked for drugs (pharmacies have more business when public facilities run out of drugs) Generally speaking pharmacists considered this to be a good business and no one replied that business was going badly

Rural pharmacists considered their customers to be low-income, while urban pharmacists consistently reported customers of all income levels Customers seemed to be almost equally male and female although rural pharmacies generally reported having more male than female customers Pharmacists generally reported that their pregnant customers come to buy iron, folic acid, or multivitamins, other purchases of pregnant women included surgical gloves and umbilical clamps for delivery or other drugs for themselves (pain medicine, heartburn treatment, or chloroquine)

2 Knowledge, attitudes, and perceptions re iron/folate and multivitamins

Almost all pharmacists, rural and urban, advise customers on medication Some expressed concern about counseling pregnant women on medication, and said that they would instead refer these women to a doctor

Generally pharmacists use multivitamins and iron synonymously although there is some differentiation in that they consider multivitamins to be more for increased appetite, and iron for weakness Most pharmacists reported that they would prescribe a multivitamin or iron to a customer with a “general weakness” complaint, some also said that they would recommend Panado or chloroquine if malaria was suspected Rural pharmacists seemed less likely to recommend anything to pregnant women than urban pharmacists, most of whom said they would recommend vitamins or iron supplements This could have been due to the higher education/qualifications of the urban pharmacists On the whole, pharmacists reported that sales of multivitamins and iron were about equal

3 Currently stocked products (iron formulations and other products addressing fatigue)

All pharmacies currently stock a variety of iron and multivitamin preparations, urban pharmacies tended to stock a greater variety than rural pharmacies Some of the common brands include *Pregnatal*, *Seven Seas* multivitamin with minerals, *Haemup* iron tonic, and *Pedivit* multivitamin for children All pharmacies also sell ferrous sulfate, folic acid, and multivitamins which they buy in bulk (tins of 1,000) and repackage (in 20's or 30's) for sale These generic pills are sold more, being significantly cheaper than the brand name products Some price comparisons are below

Generic ferrous sulfate, multivitamins, and folic acid tablets	K500 for 20 tabs
Combined ferrous sulfate/folic acid (<i>FeFol</i> , pre-packaged capsules)	K8,000 for 30 caps
<i>Centravit</i>	K8,000 for 30 tabs
<i>HaemUp</i> iron tonic	K9,000 for 200ml
<i>Pedivit</i> multivitamin for children	K2,000-K3,000 for 21
<i>Seven Seas</i> multivitamin with mineral	K19,000 for 60 tabs

For the most part, pharmacists reported recommending multivitamins for lack of appetite, and ferrous sulfate or other iron preparations for anemia, general weakness, for those who have been sick for a long time, and for pregnant women (along with folic acid for pregnancy)

Pharmacists were asked where they bought these products, based on their responses there seems to be a large number of pharmaceutical suppliers in Zambia, including Gamma Pharmaceuticals, Melcome, Medical Stores, Penguin Pharmaceuticals, Parrot Pharmaceuticals, FMS Pharmacy, Interchem, Lusaka Pharmacy, CAPS Zambia, Tata Zambia, Kings Pharmaceuticals, Africa Health, Western Pharmaceuticals, ChemPro Ltd, PharmaCare, Pharmanova, Kadamusana General Dealers, AF Services, and Mindusom Ltd. Urban pharmacists reported more frequent visits and/or phone calls from representatives of their suppliers (once every 1-2 weeks) versus rural pharmacists (once every 1-2 months). All pharmacists interviewed reported that some distributors offer promotional materials such as posters, calendars, brochures, stickers, and ball-point pens. If they had a preference, most pharmacists preferred posters, stickers, or brochures that gave some information about the product. Concerning trade promotions from the suppliers, most pharmacists said that suppliers did not offer trade promotions, but the few who did offered a cash discounts for large orders, or a lower price for new products.

Most rural pharmacists reported re-ordering iron and multivitamins once every 2-3 months, one of these said he ordered large quantities in bulk which he re-sold in bulk to local farmers for their workers. Urban pharmacists seem to order more frequently, from 3 times a month to once every two months. Re-order quantities reported by most rural pharmacists for bulk vitamins was 10 tins (every 2-3 months). There weren't clear answers for this question from urban pharmacists.

4 Standard industry margins

Urban pharmacists reported a 25-30% profit margin on iron and multivitamins. Some of the rural pharmacists were hesitant to disclose their profit margins ("the profit is there, that's why we are here", and "it's within the reach of our suffering", but those who did reported a similar mark-up for name brands (about 30%) and a cash margin of 200% for pills bought in bulk. For example, each tin of ferrous sulfate, folic acid, and multivitamin costs K8,000, and sells at K25,000 (K500 for 50 packs of 20 tablets). Pharmacies also incur the cost and time for re-packaging bulk vitamins into the small plastic bags which could not be quantified but would considerably lower the cash margin.

Pharmacists identified multivitamins and iron tablets to be amongst their top selling products. The list included mostly OTC products such as Panado and cough syrups, but also a few prescription drugs such as chloroquine and penicillin.

Most pharmacists indicated that they would want to stock a lower priced multivitamin or iron supplement because it would be available to all income levels, and would be faster moving (“Income is low around here. If it’s a lower price then it will be fast moving. Those are the ones we prefer”) One rural pharmacist specifically mentioned the added expense of re-packaging bulk vitamins as a reason why he would be interested in stocking a new low-cost multivitamin.

5 Perceptions of consumer interest/suggestions for product promotion

Rural pharmacists mentioned radio, neighbors, and health workers/facilities as sources of information on vitamins and iron supplements, urban pharmacists added TV advertisements and print ads to those sources mentioned above. When asked what leads consumers to prefer certain brands, no one reason stood out, but the list of reasons given included advertisements, packaging, price, product quality, availability, or recommendations from friends. Pharmacists were also asked what the best way to promote a new multivitamin product would be. Most thought that radio, TV, posters and informational brochures would be effective. Other responses were very diverse, and included educating school children to be messengers within communities, mobile advertisements (vans with PAs in markets and townships), promotion via health workers, advertisements in magazines or pharmacy journals, and specific product characteristics (convenient dosage, safe for a wide range of patients, and packaging in small, affordable amounts).

6 Analysis and Recommendations

While there is only a limited network of pharmacies and “drug stores” in Zambia, those that are in the business have staff which are generally well informed and qualified. The customer base of these pharmacies includes people from all income groups and would, therefore, be a suitable distribution channel to target lower income people. Pharmacies would also have access to women although in rural areas, men seem to be more likely to shop at pharmacies. Pregnant women who visit pharmacies usually do so for micronutrient supplements and for delivery aids.

Pharmacists provide advice to customers on medication, particularly OTCs such as iron and multivitamin supplements. Pharmacists’ existing levels of knowledge regarding iron and multivitamins could be improved, particularly for multivitamins, and they could play a vital role in promoting the correct use of iron and multivitamins supplements. Pharmacists also report that many of their customers are referred from public health facilities, particularly when public facilities run out of stocks.

Currently there are a wide variety of iron and multivitamin supplements, both pills and syrups, available at pharmacies. Most of the commercial brands are priced in the range of Kwacha 8,000-10,000 for 30 tablets. There is at least one brand in a separate price niche, which is the equivalent of Kwacha 3,000 for 30 tablets. An important finding is that the pharmacies interviewed had large supplies of generic product (iron and multivitamins) identical to those available in the public sector, which were priced at only Kwacha 500 per 30 tablets. The reported purchase price of pharmacists for these products is substantially lower than the international price for this commodity bought in bulk, leading to the conclusion that either this is being supplied at subsidized rates by the government or it is re-directed out from the public sector.

Given that the generic product is reported to sell the highest volumes there are important implications. There is clearly a large market for low-priced supplements. Social marketing would not only allow for recovery of some of the commodity costs but also the opportunity to increase use and attract new users.

Distribution to pharmacists is well organized. The standard margin on commercial products was stated to be 25-30%. When considering trade margins it will be important to take into account the higher price and, therefore, the higher absolute amounts that pharmacists make on commercial brands vs a lower priced social marketing. While this would be offset somewhat by the higher volumes of a lower priced product, it is recommended that trade margins for social marketed products should be kept considerably higher than those for higher priced commercial products.

While there are a number of trade promotions being offered, the variety of these is limited and they are infrequent. This would allow a social marketing project to attract greater interest amongst pharmacies with more innovative promotions. With regard to educating and promoting to consumers, pharmacists offered an interesting range of activities which should be considered based on research and a cost/benefit analysis for any IEC campaign on supplementation.

E In Depth Interviews with Shopkeepers

Only four Interviews with shopkeepers could be completed. As a result, the findings of this section should be viewed as being indicative of the sector without being conclusive.

1 General Background

Respondents were well-established, with several years in the retail business. General business trends were reportedly varied to good, with no indication that business was bad. The shopkeepers interviewed all had attended some high school although none had any additional or specialized training.

2 Products stocked

Most reported that they stocked items based on customer demand “those (products) that finish fast”, “goods which are popular with the public”, or “according to what the customers usually ask for”. All the shops stocked some medicines, primarily painkillers and cough mixtures, but also malaria prophylaxis and anti-diarrheals. One shopkeeper reported stocking these items “because sometimes these medicines are not available at the clinic”. None of the stores sell medicines specifically for pregnant women. The re-order time for medicines varied from fortnightly to every 2-4 months.

3 Customer profile

“Regular” customers were reported to be in the low to middle income range, including villagers, farmers, government employees, and self-employed. Both men and women are reported to buy medicines equally.

4 Counseling practices

Counseling practices were inconsistent from shop to shop, some shopkeepers advise customers on what medicines to buy, some do not. Those who do said that they advise painkillers such as Cafemol for customers with “general weakness” complaints (presumably for the caffeine-stimulant which is present in those preparations). No shopkeepers interviewed recommend medicines to pregnant women.

In response to the questions regarding why consumers chose one brand instead of another, shopkeepers felt that their advice played a large part in the decision.

5 Multivitamins/iron

Some shopkeepers reported currently stocking multivitamin syrup for children, priced at K1,800-K2,000 for one 100ml bottle. This multivitamin is recommended to improve appetite.

Shopkeepers were also asked about their willingness to stock a new multivitamin or iron supplement for pregnant women, if it were available on the market. In general, they seemed to be willing to stock such a

product Awareness of multivitamins seemed to be higher than that of iron or folate “Yes, (I would stock) especially multivitamins, but the other ones, I don’t know whether people would buy”, and “He (the shopkeeper) has seen Multivits and used them before but he has never seen iron and folate” Those that currently stock the children’s multivitamin syrup seemed to think that a multivitamin would sell, because people currently ask for and come to buy multivitamins One shopkeeper (who doesn’t currently stock multivitamins) wasn’t interested in such a product “because people won’t buy”

6 Purchasing and trade margins

Shopkeepers mostly buy products for their stores at the closest urban centers (Lusaka and Livingstone) Visits by distributors or salesmen are rare and most buy at wholesale markets

In order to assess existing trade margins, interviewers were asked to provide purchase and sales prices of common consumer products Margins varied considerably with a range of 25% to 100% with the highest margins on cigarettes and margins of approximately 40-50% for on sugar and detergents Margins on Cafemol, an analgesic, were reported to be 65%

7 Product promotion

Current promotional materials found in the shops visited were from various bottling companies (Coca-Cola calendars, posters for Fanta, Shake Shake beer and Rhino beer) Suggestions for promoting a new product included similar materials (posters, informational leaflets) and mass media Also mentioned were the factors of price, availability, and effectiveness of the product

8 Analysis and Recommendations

Shopkeepers would seem to provide an excellent opportunity for more convenient access to low and middle income consumers for supplements They are currently stocking popular OTC products and expressed an active interest in multivitamins, with less interest in iron There are some obvious pre-conditions to such a strategy

Demand - shopkeepers were unanimous in choosing to stock those products which were specifically requested by customers and also those which were high turnover

Margins - retail margins would need to be competitive

Distribution - wholesale markets would need to be aggressively targeted in order to reach retail outlets

Retail shops and shopkeepers are also an important source of information for consumers and POP materials, as well as shopkeeper incentives, could play an important role

V CONCLUSIONS

There exists an excellent foundation for a widespread anaemia control programme in Zambia. The vast majority of women receive ante natal care and some counseling on iron, folate and, less consistently, multivitamin supplementation. Knowledge regarding iron and multivitamin supplements is almost universal amongst women and these supplements are provided free of cost from public health centers.

Based on the findings of this research there are a number of conclusions which are presented for consideration as next steps:

- a) Organize a meeting of relevant stake holders in Zambia, such as the MoH, CBOH, INAN, Medical Stores, and international agencies, to present and discuss these findings
- b) Concerned agencies to review the supply of iron and folate supplements to rationalize these on the basis of a combined iron/folate pill with a once a day regimen and take necessary action
- c) Relevant agencies to review possible actions to improve logistics in order to avoid stock outs at health centers and potential leakages into the private sector, and take necessary action
- d) Relevant agencies to review the need for including refresher training on iron, folate and multivitamin supplementation for ANC health workers. A module on service orientation and interpersonal communications should also be considered and necessary action taken
- e) Relevant agencies to review the need for a comprehensive IEC campaign to dispel the myths related to iron supplementation and provide more positive information related to iron, folate and multivitamin supplements, and take necessary action
- f) Concerned organizations to consider the role that social marketing of a multivitamin supplement to all women of reproductive age in complementing public sector initiatives. Of particular importance are the difficulties in proper compliance of iron supplementation during pregnancy and the fact that the principal determinant of a woman's iron status at the end of pregnancy is her iron status when entering pregnancy. Also, given that most women present themselves for ANC mid-way through their pregnancy it is vital that they be reached earlier when their stores can be built up and their productivity raised. Finally, there is important recent research to indicate that multivitamins taken by HIV+ women increases their T-cell count and reduces vertical transmission
- g) Follow-up research on issues related to social marketing which were not directly addressed in this research

The efforts made to date in Zambia provide an excellent opportunity for taking this initiative further. With relatively little additional investment, and in some cases even cost savings, Zambia could have one of the best micronutrient supplementation programmes in the developing world.

Appendix One Research Protocol

Research on Iron Supplements in Zambia

Statement of Purpose

The purpose of this consultancy is to undertake research which will provide information leading to the design of a social marketing project to support the efforts of the Ministry of Health in improving the iron/micronutrient status of women in the country

Background

An assessment trip to Zambia by LINKAGES (including PSI) in 1997 found that the supply of iron/folate in health centers and pharmacies is quite high. Furthermore, about 90% of pregnant women attend pre-natal care. Seventy-one percent of these women have four or more prenatal visits during their pregnancy according to the 1996 DHS. Supply of iron/folate pills in public health facilities is considered adequate. Nonetheless, discussions with health center personnel and pharmacists revealed low levels of iron/folate use by women. Of those who receive pills, compliance is often believed to be a problem. A comprehensive iron/folate distribution and IEC program is a priority of the MOH. It is not yet clear whether a new product is necessary, if current products need to be better promoted, or a different approach would provide better results.

No recent nationwide data is available on the prevalence of anemia in pregnant women. A study done in the early 1970s showed a "high" prevalence (of 40 to 60%). A more recent survey in Ndola province (1996) revealed a 34% rate of anemia (OMNI, 1996). The NFNC is planning an anemia prevalence survey that is scheduled to take place in 1998.

The Project

LINKAGES, through its partner organisation PSI and its affiliate in Zambia, the Society for Family Health (SFH), is interested in contributing to the MoH's efforts to improve the iron/micronutrient status of Zambian women. As there are many unanswered questions, the first phase is to research relevant issues which would lead to the identification of project strategies/ activities. The research will specifically focus on the social marketing and communications aspects of iron/micronutrients to complement the research being done by the NFNC.

Objectives

The objectives of this research are as follows

- 1 To identify reasons for iron/micronutrient supplement usage and non-usage amongst Zambian women
- 2 To identify possible steps/strategies to increase usage amongst Zambian women
- 3 To identify compliance behaviour amongst Zambian women who have used iron/micronutrient supplements and the reasons for the same
- 4 To identify possible steps/strategies to improve compliance of the iron/micronutrient supplement regimen amongst Zambian women

Activities

In order to gather information related to the objectives listed above, the contractor will conduct qualitative research and hold meetings with relevant stakeholders. These activities are described below.

1 Focus Groups

A total of 6 focus groups will be held with the following basic recruitment criteria:

- a) 2 focus groups of lower-income women, aged 25-30, who report having complied with the regimen for iron/micronutrient supplements during their last pregnancy (one group in Lusaka, one in a large village)
- b) 2 focus groups of lower income women, aged 25-30, who report having stopped following the regimen for iron/micronutrient supplements during their last pregnancy (last pregnancy" refers to a pregnancy within the last two years). One group in Lusaka, one in a large village
- c) 2 focus groups of lower income women, aged 25-30, who report not having used iron/micronutrient supplements during their last pregnancy (one group in Lusaka, one in a large village)

The discussion guidelines will be similar, although not identical for all the groups. A variety of topics will be covered, including:

- their perception of good health vs bad health (probe weakness, exhaustion and paleness)
- perceived causes of weakness (probe "during pregnancy")
- changed behaviour when feeling weak (probe in detail and also "during pregnancy")
- daily preventive health behaviour and its perceived importance
- knowledge levels on iron/anaemia/micronutrients
- sources of knowledge (who and what)
- preferred sources of credible information for health
- attitudes about pill taking in and out of pregnancy
- perceived reasons why pills (iron) are given during pregnancy
- motivating factors for behaviour adoption for use, dropout and non-use (perceived risks/need and benefits)
- Realistic/length of a regimen prescribed regimen, regimen adopted, longest ever followed regimen
- experience with side effects (what side effects, did they receive counselling, if yes, what counselling, how did they deal with side effects)
- accessibility of products (availability and affordability), public sector and commercial
- opinion of product characteristics (taste, smell, packaging, etc)
- purchasing behaviour (who buys, who decides, etc), including commercial products
- suggestions for improving iron intake amongst pregnant women

2 In-depth Interviews

- a) Mothers: Four in-depth interviews will be held with each of the following (2 urban and 2 rural) to determine factors which influence clinic attendance and iron/folate supplement intake related to clinic attendance and counselling:

- mothers who visited public health facilities at least three times during their last pregnancy,
- mothers who visited a public health facility only once and discontinued, and

- mothers who did not visit a public health facility during their last pregnancy

The interviews will also explore issues related to iron supplement intake, perceptions regarding its use and effectiveness, regimen followed and how this is determined, side effects and compliance

- b) **Pharmacists** In depth interviews will be held with pharmacists to determine their existing level of knowledge, attitudes, perceptions and beliefs regarding iron/folate, interest/willingness to stock and promote iron/folate, standard industry margins/discounts, their perceptions of consumer interest/limitations to using the product, estimated volumes, currently stocked iron formulations, other products stocked which address fatigue, etc Two interviews will be held with pharmacists in Lusaka and two from smaller towns/rural areas
- c) **General Store Shopkeepers** Four in-depth interviews (2 in Lusaka and 2 in rural areas) will be held to determine the level of interest of shopkeepers in stocking OTC products and their KAP regarding iron supplements

3 Mystery Clients

- a) **Health Workers** Eight mystery client interviews, four with interviewers posing as pregnant but not having used iron supplements and four with interviewers posing as having side effects (two of each in Lusaka and two of each in rural areas), will be held with health workers to determine their level of counselling and experience with iron/folate
- b) **Pharmacists** Four mystery client interviews will be held (two in Lusaka and two in small towns in rural areas) with pharmacists to determine their behaviour regarding counselling women for general weakness and for pregnancy This will include probing on how pro-active pharmacists are in counselling women

4 Meetings

Meetings will be held with concerned officials from the Government of Zambia and the private pharmaceuticals sector on issues related to iron supplementation, including

- regulations concerning registration of iron/folate
- outlets where it is allowed to be sold
- advertising restrictions, if any
- formulation requirements
- issues of supply and demand
- availability of iron supplements at various levels
- local manufacture possibilities of both regular iron/folate and also slow release version
- taxation issues for local manufacturing and importing products
- government and industry needs for increasing the use of iron/folate

5 Literature Review

Review the NFNC study and comment on its implications for an SFH iron/folate social marketing project (This component will depend on when the NFNC study is completed) Other relevant literature on the subject, such as the research done by MotherCare in Indonesia, will also be reviewed