

# A Study on Acceptability and Compliance of Calcium Supplementation among Pregnant Women in Two VDCs of Banke District



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# Abbreviations

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AHW	Auxiliary Health Worker
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
CPW	Currently Pregnant Women
CMA	Community Medical Assistant
DIL	Daughter-in-law
DHS	Demographic Health Survey
DPHO	District Public Health Office/Officer
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
GoN	Government of Nepal
MCHW	Maternal and Child Health Worker
MDG	Millennium Development Goal
MIL	Mothers-in-law
MCHIP	Maternal and Child Health Integrated Program
NDHS	Nepal Demographic Health Survey
NFHP	Nepal Family Health Program
NMMMS	Nepal Maternal Morbidity and Mortality Study
RCT	Randomized Controlled Trials
SD	Standard Deviation
SHP	Sub-health Post
TBA	Trained Birth Assistant
VaRG	Valley Research Group
VDC	Village Development Committee
VHW	Village Health Worker



# Executive Summary

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While the maternal mortality ratio in Nepal has fallen in this past decade, many Nepalese women still die of preventable causes. The Nepal Maternal Morbidity and Mortality Study (NMMMS) 2008/2009 showed that pre-eclampsia/eclampsia is now the second leading direct cause and accounts for 21% of maternal deaths. As the Government of Nepal (GoN) has strategically addressed the leading cause of maternal mortality—postpartum hemorrhage, there is now interest under Family Health Division (FHD) leadership within the Ministry of Health and Population (MoHP) in addressing pre-eclampsia/eclampsia.

Global evidence from the 2010 Cochrane review suggests calcium supplements reduce the risk of pre-eclampsia by about half, reduce the risk of preterm birth and lower the risk of the woman dying or having serious problems. Calcium supplementation during pregnancy is a safe and relatively cheap means of reducing the risk of pre-eclampsia in women at increased risk and those from communities with low dietary calcium. The Lancet 2008 series on interventions for maternal and child under nutrition and survival found there was sufficient evidence to recommend maternal calcium supplementation to improve maternal and birth outcomes.

FHD with technical assistance from the ACCESS Program, the Maternal and Child Health Integrated Program (MCHIP), the Nepal Family Health Program II (NFHP II) and Plan Nepal is interested in piloting calcium supplementation among pregnant women in Nepal. To inform the design of the pilot, this study was conducted primarily to determine user preference between two different antenatal calcium formulations: powder (in a sachet, to be taken with food) and tablets. A secondary objective was to assess compliance with both calcium supplements and iron folate. This study was designed in 2009 with ethical approval from Nepal Health Research Council (NHRC). It was conducted by Valley Research Group (VaRG) with MCHIP funding from United States Agency for International Development (USAID) in coordination with the Banke District Public Health Office (DPHO).

The study employed a crossover trial design in two village development committees (VDCs)—Udarapur and Titiharia of Banke district in southwestern Nepal. From the end of December 2009, the intention was to enroll approximately 150 pregnant women over a six-week period. Due to time limitation, only 97 PW were enrolled in the study. In each VDC during the study period, female community health volunteers (FCHVs) consecutively enrolled pregnant women, targeting women in their second trimester (participants were enrolled between 20–30 weeks), and obtained their informed consent. The study was designed to provide those enrolled in one VDC with a one month supply of calcium powder and in the other VDC, calcium tablets. FCHVs explained to participants the expected benefit in reducing risk of an important pregnancy complication (pre-eclampsia) and instructed them to take their calcium at the time of their breakfast or morning meal and their iron pills with their evening meal. After one month those in the VDC initially assigned to powder were given a month's supply of calcium tablets and those in the VDC initially assigned tablets were given powder. Altogether 97 were enrolled: 54 received tablets the first month and 43 started with powder. All switched to the alternative formulation for the second month.

At the end of the second month, participants were surveyed. After one month of each form, compliance (30 days) for tablets and powder were about the same: 70% and 72% respectively. At this time, only 75 were eligible to continue for the third month: 19 had already given birth and three had migrated. FCHVs asked each participant if she would like to continue for a third month and, if so, which of the two formulations she would like to use. Women were interested in taking the calcium; only 8% declined to take either form of calcium for the third month. **Preference** was: 72% chose tablets, 17% chose powder and 3% had no preference. Calcium supplementation was generally acceptable: a majority (73%) of the women said they would accept any form of calcium if they could not get the preferred form.

In the third month when women were taking their preferred form of calcium, compliance (30days) was 82% for tablets and 69% for powder. By the end of the third month, only 62 pregnant women completed the full course of calcium. Of the 13 PW who did not complete the third month, nine gave birth during the third month and four stopped taking the supplements due to illness (as advised by the FCHVs).

Among those who remained in the study for the full 90 days, **compliance** with calcium was good. Among those women who remained in the study for the full three months (n=62), over half (52%) had consumed the calcium for 90 days and a quarter (24%) had consumed for 80–89 days. These women however reported they did not always take the full dose of calcium every day: only 32% took the full dose for all 90 days and 29% for 80–89 days.

**Compliance Over Full Duration of the Study: Days and Doses**

NUMBER OF DAYS OR DOSES CONSUMED	NUMBER OF DAYS CONSUMED		NUMBER OF DOSES CONSUMED (TABLETS OR POWDER)	
	%	NUMBER	%	NUMBER
Less than 80	24.2	15	38.7	24
80-84	8.1	5	14.5	9
85-89	16.1	10	14.5	9
90	51.6	32	32.3	20
<b>Mean (SD)</b>	<b>82.3</b>	<b>(13.1)</b>	<b>79.2</b>	<b>(13.1)</b>
<b>Total</b>	<b>100.0</b>	<b>62</b>	<b>100.0</b>	<b>62</b>

With a dosing regimen involving taking iron and calcium supplements at different times of the day, there was concern that compliance with iron may be affected. For most women however this did not pose a problem. Four of five study participants (79%) reported not having missed any of their iron doses. Among the other 21%, all reported that having to take the iron and calcium at different times was a factor in their missing doses.

Study participants and FCHVs both had high levels of knowledge about calcium. Of the pregnant women surveyed at the end of the third month, 72% were aware that use of calcium supplements during pregnancy can prevent headache and convulsion or fits (72% each); 74% correctly said that calcium should be taken for three months; and more than 60% correctly mentioned that the consumption of calcium should start normally from the fifth month of pregnancy. Almost all (99%) knew calcium should be taken once a day, correctly recalling two calcium tablets to be taken each day (98%) or one packet of calcium powder each day (97%).

**Main conclusions:**

- Women were interested in taking calcium, with a majority (73%) reporting they would accept any form of calcium if they could not get the preferred form.
- When given a choice, women preferred tablets to powder by a ratio of more than 4 to 1.
- Compliance was very good, with over 70% reporting they missed no doses. It would perhaps have been higher if both iron and calcium supplements were taken at the same time.
- Over 95% of women reported they would take calcium in their next pregnancy and would recommend calcium to other pregnant women.

# Chapter 1 Introduction

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This report shares findings from a small acceptability study conducted primarily to determine:

- User preference between two different antenatal calcium formulations: powder (in a sachet, to be taken with food) and tablet;
- Compliance with two form of calcium supplements; and
- Recommendations for future calcium supplementation activities.

The findings will inform government interest in piloting calcium supplementation among pregnant women to reduce pre-eclampsia in Nepal. The Family Health Division (FHD) within the Department of Health Services (DoHS) in the Ministry of Health and Population (MoHP) led the study in 2010 with technical assistance from the ACCESS Program, the Maternal and Child Health Integrated Program (MCHIP) and the Nepal Family Health Program II (NFHP II). This study received ethical review and approval from Nepal Health Research Council (NHRC). Valley Research Group (VaRG) conducted this study with MCHIP funding from United States Agency for International Development (USAID) and in coordination with the Banke District Public Health Office (DPHO).

## 1.1 MATERNAL HEALTH SITUATION IN NEPAL

While the maternal mortality ratio in Nepal has fallen in this past decade from 539 to 281<sup>1</sup>, many Nepalese women still die in pregnancy and childbirth of preventable causes. The five major direct causes of maternal death reported in Nepal are postpartum hemorrhage, eclampsia, obstructed labor, puerperal sepsis and unsafe abortion, in order of magnitude. While maternal mortality declined, PE/E proportionately increased among maternal deaths from 14% in 1998 to 21% in 2008<sup>2</sup>. Pre-eclampsia/eclampsia is now the second leading direct cause and accounts for 21% maternal deaths. Pre-eclampsia and eclampsia are common causes of serious morbidity and death.

MoHP has prioritized the national safe motherhood program to improve demand, access and use of maternal and child health services to improve maternal and newborn health and achieve the United Nations Millennium Development Goals (MDGs). Over the past decade, services have been strengthened and expanded to offer comprehensive and basic emergency obstetric and newborn care (CEmONC, BEmONC)—including the detection and management of PE/E. Service delivery improvements have been complemented by community-based services, counseling and education of pregnant women, their families and communities through the use of the birth preparedness package (BPP) to promote birth preparedness and complication readiness (BP/CR).

One strategy successfully employed by the MoHP has been to identify the leading causes of newborn, child and maternal mortality and develop simple, low-cost community-based interventions to address them. For example, FHD has strategically focused on the leading cause of maternal mortality—postpartum hemorrhage (PPH) over the past five years. Recently, there is interest in addressing pre-eclampsia/eclampsia (PE/E) in the same way.

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<sup>1</sup> Population Division Ministry of Health and Population, New ERA, Macro International Inc. 2007. *Nepal Demographic and Health Surveys, 2006*. Nepal

<sup>2</sup> Family Health Division, Options UK, New Era and CREHPA. 2009. *Nepal Maternal Mortality and Morbidity Study 2008/2009*. Nepal

## Calcium and Pre-eclampsia Prevention

Global evidence suggests that prevention of pre-eclampsia is possible through regular intake of calcium during pregnancy. The Cochrane Review (2010)<sup>3</sup> found that calcium supplementation (at least one gram daily) for high-risk and calcium deficient women “help prevent pre-eclampsia, preterm birth and lower the risk of the woman dying or having serious problems.” Use of calcium halves the incidence of pre-eclampsia<sup>4</sup>. The Lancet 2008 series<sup>5</sup> on interventions for maternal and child under nutrition and survival found there was sufficient evidence to recommend maternal calcium supplementation to improve maternal and birth outcomes. Acknowledging calcium supplementation reduces the risk of hypertension and pre-eclampsia during pregnancy, The World Health Organization (WHO)<sup>6</sup> cautions that since calcium interferes with iron absorption, calcium supplementation should be taken at a separate time of day.

## ANC Services in Nepal

Calcium supplementation in developing countries however has not been routinely offered during antenatal care (ANC) as iron. Globally ANC use and quality is variable, and iron supplementation programs have not had the desired reach or impact. In Nepal, 76% of pregnant women receive at least one ANC visit and 29% receive the recommended four or more ANC visits<sup>7</sup>. The iron intensification program in Nepal is one of the more effective ones globally with almost 60% of women reporting they took iron tablets during the pregnancy of their last birth (NDHS 2006). This is due in part to the robust community-based network of almost 50,000 female community health volunteers (FCHVs) who distribute iron, counsel women and provide other maternal, newborn and child health services at home. The complementarity of facility-based ANC services and community-based FCHV visits offers an existing system for the delivery of other ANC services such as calcium supplementation.

## 1.2 STUDY CONCEPTUALIZATION AND PLANNING

In 2008, the ACCESS Program—a 5-year global program (2004–2009), led by Jhpiego and sponsored by USAID to improve the health and survival of mothers and their newborns—began to explore evidence on ways to prevent, detect and manage PE/E. A number of interventions were identified—including calcium supplementation as a prevention strategy. Jhpiego further explored innovations and emerging evidence that would contribute to PE/E programs, such as a low-cost calcium supplement in the form of powder, packaged in small sachets that could be added to food.

This study was designed in 2009 with ethical approval from Nepal Health Research Council (NHRC). It was conducted in early 2010 by Valley Research Group (VaRG) with funding from USAID through the Maternal and Child Health Integrated Program (MCHIP)—the global maternal, newborn and child health program that follows the ACCESS Program. NFHP II provided technical assistance in materials development, monitoring and evaluation

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<sup>3</sup> Palacios C, Pena-Rosas JP. *Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems : RHL commentary (last revised: 1 February 2010)*. The WHO Reproductive Health Library; Geneva: World Health Organization.

<sup>4</sup> Update with 2010 cochrane Hofmeyr G, Atallah Á, Duley L. *Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems*. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD001059. DOI: 10.1002/14651858.CD001059.pub2

<sup>5</sup> Bhutta ZA et. al. *What Works? Interventions for Maternal and Child Under nutrition and Survival*. *Lancet*. 2008 Feb 2; 371 (9610): 417-40

<sup>6</sup> Palacios C, Pena-Rosas JP. *Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems : RHL commentary (last revised: 1 February 2010)*. The WHO Reproductive Health Library; Geneva: World Health Organization.

<sup>7</sup> Population Division Ministry of Health and Population, New ERA, Macro International Inc. 2007. *Nepal Demographic and Health Surveys, 2006*. Nepal

(M&E), training, district orientations and program implementation. NFHP II also worked with the Banke DPHO to ensure good coordination and district-level support.

Calcium (tablets and powder) required for pilot were donated by Jhpiego. Calcium tablets are commonly manufactured in 500 mg tablets, requiring two tablets as the daily dose. A full course for one pregnant woman of 180 tablets cost 5.7 USD. Calcium powder (one gram of calcium carbonate) was packaged in India specifically for this study. A full course for one pregnant woman of 100 packets cost just 1 USD.

### **1.3 CALCIUM INTERVENTION DESIGN WITHIN THE STUDY**

With these two forms of calcium available, this small acceptability study was designed to first use pregnant women's preference and compliance to inform a larger community-based calcium pilot.

The calcium intervention was designed to supplement pregnant women from the second trimester (enrolled between 20–30 weeks) with one gram of calcium daily for three months (90 days). The introduction of calcium in this study was carefully designed to be: modeled on the iron intensification program; utilize existing government systems for distribution, education and reporting; and be replicable during the pilot and possible future national programming. The intervention involves health workers and FCHVs in counseling pregnant women and their families using a one-page addition to the BPP and distributing a 30-day supply of calcium in a simple envelope.

Each month supply of calcium included a pictorial information leaflet with simple pre-tested messages about the benefits of taking calcium and instructions on how and when to take calcium. As pregnant women are instructed to take iron with the evening meal, women in the acceptability study were instructed to take calcium with the morning meal. Because two forms of calcium were being distributed during this study, two sets of BCC materials (BPP flipchart page, leaflet and envelope) (see **Appendix A**) were developed. It is worth noting that the instructions for how to take calcium and the daily dosing were different for tablets and powder:

- Two calcium tablets are taken daily with a glass of water after a morning meal.
- One calcium powder packet is to be added and mixed into the morning meal.

For district-level orientation, meetings were held with the DPHO in Banke and FHD in November 2009 to discuss the study and gather input into the design, including VDC selection. The study was presented to the Reproductive Health Coordinating Committee (RHCC) in Banke to orient all stakeholders. VDC orientations were also conducted before the study began.

For monitoring and evaluation (M&E), existing community-level data collection systems were used without adding any separate reporting burden to field staff and FCHVs. Reporting on calcium distribution by FCHVs was made simple by modifying the existing one-page pictorial community-based maternal and newborn care register created for each pregnant woman with a simple sticker to record calcium distribution. Data were monitored by health worker at the monthly FCHV meetings. For study purposes, VaRG reviewed the copy of same page remains with FCHV and used its own field research team to collect data presented in this report. However, community-based M&E was introduced to test data collection to inform the pilot.

For training, a brief training was developed for health workers (half-day) and for FCHVs (one day) to introduce them to the study, the benefits of calcium supplementation, and educational materials and messages for pregnant women and their families. Trainings were connected with other events when possible to minimally disrupt services. In total, all seven health care workers and 34 FCHVs were trained on calcium supplementation before the study began.

**FCHVs taste the calcium powder during the orientation in December 2009**



Photo credit: Geeta Sharma

## 1.4 OBJECTIVES OF THE STUDY

The main objective of this study was to examine the acceptability and ease of use of two different forms of calcium supplements (tablets and powder) for use by pregnant women to prevent pre-eclampsia.

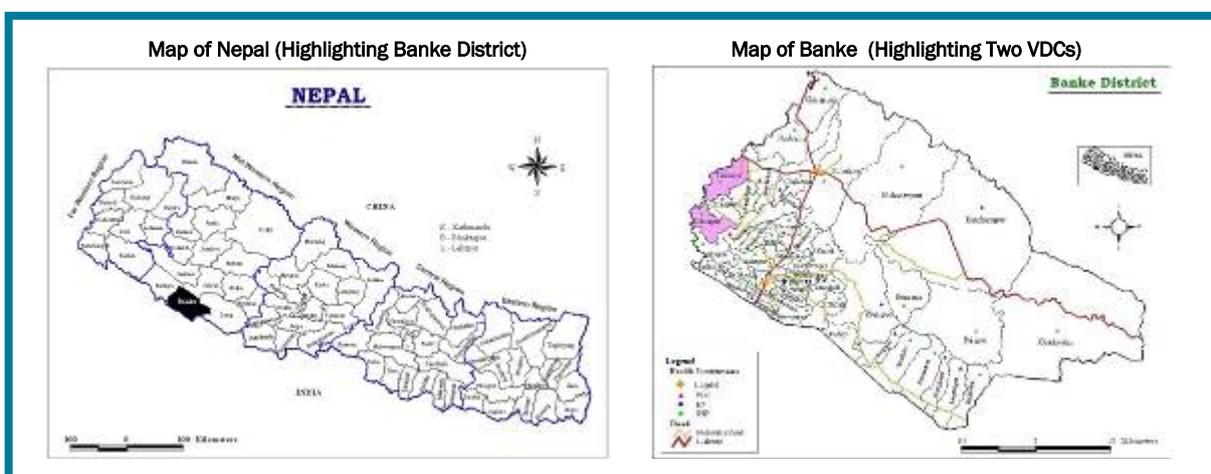
The specific objectives were:

- a. To examine the level of acceptability and compliance of calcium consumption among participating pregnant women and their preferences for the different formulations;
- b. To examine the level of acceptability and support for calcium among the family members of pregnant women; and
- c. To provide suggestions for strategies for modifying and scaling up the intervention.

## 1.5 METHODOLOGY

### Study Design

The study employed a crossover trial design in two VDCs—Udarapur and Titiheria of Banke district. These two VDCs were purposively selected in consultation with MCHIP, NFHP II and DPHO of Banke district. All wards from the two VDCs were included for identification of respondents.



The study began at the end of December 2009. In Udarapur VDC, pregnant women were first given calcium in tablet form and Titiheria VDC with the powder form. After one month of supply, the type of calcium was switched. The first phase of data collection occurred at the end of the second month during the intervention. At the end of second month, the pregnant women participating in the study were offered their preferred form

of calcium supplements and they were supplemented with their preferred form from the beginning of third month. At the end of the third month—also the end of the intervention, data were collected (second phase).

The following tables provide an overview of the study data collection design (see **Tables 1 and 2**).

**Table 1. Timing of Semi-structured Interviews and Focus Group Discussions**

SN	RESPONDENT TYPE	UDARAPUR VDC		TITIHERIA VDC	
		PHASE 1: END OF SECOND MONTH	PHASE 2: END OF THIRD MONTH	PHASE 1: END OF SECOND MONTH	PHASE 2: END OF THIRD MONTH
<b>1</b>	<b>Semi-structured interview with:</b>				
	Currently pregnant women	X	X	X	X
	Female community health volunteers	-	X	-	X
	Sub health post staff	-	X	-	X
<b>2</b>	<b>Focus group discussions with currently pregnant women</b>	X	X	X	X

**Table 2. Number of Semi-structured Interviews and Focus Group Discussions by Respondent Type and VDC**

SN	RESPONDENT TYPE	UDARAPUR VDC		TITIHERIA VDC	
		PHASE 1: END OF SECOND MONTH	PHASE 2: END OF THIRD MONTH	PHASE 1: END OF SECOND MONTH	PHASE 2: END OF THIRD MONTH
<b>1</b>	<b>Semi-structured interview with:</b>				
	Currently pregnant women	54	41	43	34
	Female community health volunteers	-	17	-	15
	Sub health post staff	-	2	-	5
	<b>Total</b>	<b>54</b>	<b>60</b>	<b>43</b>	<b>54</b>
<b>2</b>	<b>Focus group discussions with currently pregnant women</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

## Study Population and Sample

The study population consisted of:

- Currently pregnant women (CPW) in their second trimester residing in the two VDCs at the time of survey;
- Husbands of currently pregnant women;
- Mothers-in-law (MIL) of currently pregnant women; and
- FCHVs and sub-health post (SHP) staff of the study VDCs.

A total of 97 CPW (54 from Udarapur and 43 from Titiheria) were enrolled in this study. They were selected on first come first basis during the first month. Similarly 24 husbands and 25 MILs also were included from these VDCs.

In the two VDCs, there were a total of 34 FCHVs and seven SHP staff, all of whom participated in training. All SHP staffs and 32 FCHVs participated in calcium distribution for the study.

## Data Collection Methods and Instruments

Information was collected from different categories of the respondents using both quantitative and qualitative survey methods such as FGDs and semi-structured interviews.

Since the study is part of a short-term intervention, instruments were developed to collect and record information of both during the intervention (first phase) and after intervention (second phase). The study tools were developed in consultation with MCHIP and NFHP II. The questionnaire for pregnant women was pretested in Bara district among CPW who received calcium from government health facility and modified accordingly.

a) **Semi-structured interview guide for pregnant women**

A semi-structured interview guide was developed and pretested to collect information from pregnant women. The guide consisted of closed (coded) and open-ended questions, which generated information on the personal profile of the pregnant women, type of calcium (tablet and/or powder forms) received, calcium consumption practices, experiences with side effects, any difficulties in consuming calcium, storage issues, reasons for not completing the full course of calcium and calcium preference (tablets or powder).

b) **Semi-structured interview guide for husbands and MIL of pregnant women**

A semi-structured interview guide was developed and pretested with the husbands and MIL of the pregnant women participating in the study. The guide consisted of question items which generated information on the following areas:

- Personal profile of the respondents
- Knowledge about purpose of taking calcium during pregnancy
- Opinion regarding the need for using calcium during pregnancy
- Type of calcium (tablet and/or powder forms) received by their wife or daughter-in-law (DIL)
- Approval and type of support provided from husband and MIL to use calcium

c) **FGD guide with CPW**

In addition to the collection of information on individual's experience and perception regarding calcium uses through semi-structured interviews, opinions and suggestions of pregnant women regarding calcium were collected through FGDs. For this purpose a FGD guide was developed and used. The questions raised in FGD were similar to those included in the semi-structured interviews.

d) **Semi-structured interview guide for FCHVs and health workers**

A semi-structure interview guide for FCHVs and health workers was developed and used to generate information on:

- Personal profile of the FCHVs and health workers
- Experiences in recording the distribution of calcium
- Perception and views on availability, coverage, acceptability and compliance of use of calcium by the pregnant women
- Suggestions regarding training, community and women education, logistics, supervision and monitoring of calcium supplement scheme

## Data Collection Procedure

The study team consisted of two senior researchers, one computer programmer and four female field assistants experienced in conducting quantitative and qualitative research. Two field assistants were mobilized in each VDC. The field staff spent about five weeks in the first phase and another three weeks in the second phase of the survey in the field for data collection. Three days training was given to field assistants before mobilizing them to the field for data collection.

The senior team member also visited the study areas in the first phase of the data collection to obtain first hand information and supervise the fieldwork.

Data required for the purpose of the study were collected in two phases:

### **First Phase of the Study**

The first phase of the study was two months, allowing all pregnant women participating in the study to receive and consume both forms of calcium. In the first month the women of Udarapur VDC were provided with tablet form of calcium while those of Titihiriya VDC were provided with powder form of calcium for one month. In the second month, the distribution of the form of calcium was switched i.e. women of Udarapur VDC got powder and those of Titihiriya VDC got tablet form of calcium for another one month.

After two months of calcium use, the first phase concluded with semi-structured interviews and FGDs among the pregnant women, their husbands and MIL by the trained female interviewers. Interviewers received a list of women taking calcium from the FCHVs of the ward and used the semi-structured interview guides and FGD guides as described above.

The first phase of the data collection activity was conducted during March–April 2010.

At the end of first phase, participating pregnant women were asked whether they would like to choose calcium tablet or powder for the third month. According to their preference, they were provided with calcium in the form they chose or preferred: either tablet or powder.

### **Second Phase of the Study**

The second phase was one month, the third and final month of calcium supplementation. The second phase was conducted during May–June 2010. After three months of the intervention, a second phase survey was conducted among the CPW by the trained female interviewers. The semi-structured interview guide and FDG guides used in the first phase were modified for this phase. Modified survey instrument were used for FGD and interview of pregnant women and interview of their husbands and MIL.

In this phase of the study, FCHVs and health workers were also contacted/interviewed to collect necessary information.

### **Data Processing, Analysis and Report Writing**

Quantitative data collected through semi-structured interviews were analyzed using a statistical package for social studies (SPSS) software package, while the qualitative data from the FGDs were transcribed, coded and synthesized manually. The relevant characteristics of the respondents have been presented across the respondent type (i.e. CPW, husbands and MIL) and most of the findings on knowledge and use of calcium by the CPW by first and second phase. Notable observations between these two phases of surveys were compared to highlight the changes. The survey results have been presented in the form of tables and graphs.



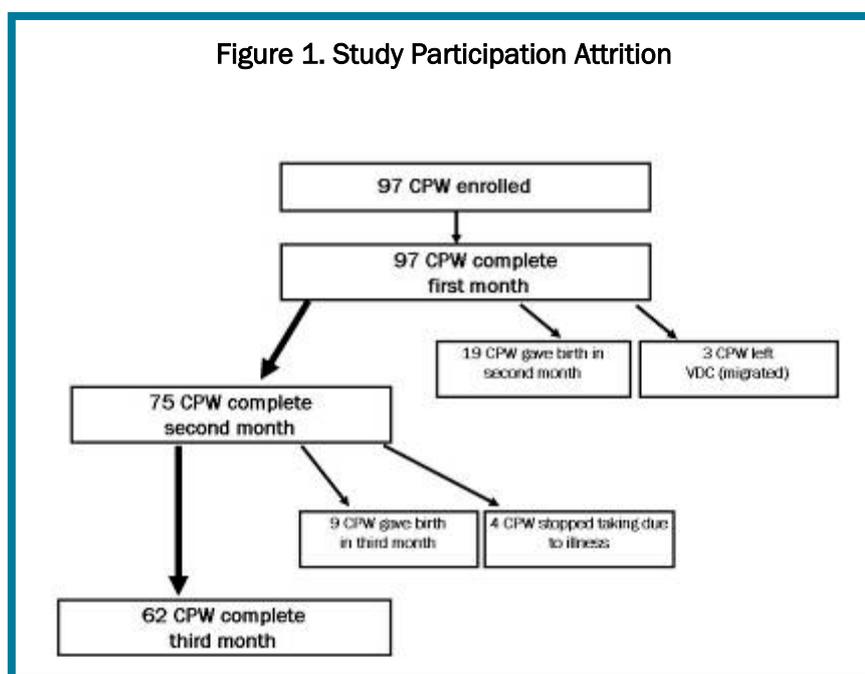
## Chapter 2 Findings for CPWs and Their Families

A total of 97 CPW were enrolled at the start of the study in their second trimester. All 97 CPW completed the first phase and were interviewed. For second phase, Only 75 of 97 were eligible to take calcium but only 62 CPW completed the second phase. Those 62 CPW were interviewed at the end of the study for the second phase.

To assess effects of family members in compliance and acceptability of calcium consumption by the CPW, information was collected from husbands and MIL. A total of 49 respondents (24 husbands and 25 MIL) were interviewed in the first phase and 35 (17 husbands and 18 MIL) in the second phase.

### 2.1 NUMBER OF RESPONDENTS IN THE FIRST AND SECOND PHASE OF THE STUDY

In the first phase of the study, 97 pregnant women were enrolled. As seen in **Table 3**, there was no participant attrition (dropouts or lost to follow-up) between month 1 & 2.



At the end of the second month, participants were offered their choice of calcium (tablet or powder). At this point in time, only 75 PW (77%) were eligible to continue for the third month: 19 were already given birth of their babies and three had migrated to another place (see **Table 3**).

At the start of the third month, 75 CPW were still eligible to continue, with 76% choosing tablets and 16% choosing powder. 5% CPWs decided not to continue taking calcium for the third month and 3% CPWs had no preference.

At the end of the third month, only 62 CPW had completed the full three months (see **Figure 1**): nine gave birth during the third month and four fell ill and stopped taking the calcium upon the advice of the FCHV.

**Table 3. Distribution of Respondents by VDC, Month and Calcium Form (Tablet or Powder)**

	TITIHERIA VDC			UDARAPUR VDC			BOTH VDC
	POWDER	TABLET	TOTAL	POWDER	TABLET	TOTAL	
<b>Total CPW received calcium (first phase)</b>							
First month	43	-	43	-	54	54	97
Second month	-	43	43	54	-	54	97
<b>CPW not eligible for 3<sup>rd</sup> month</b>			9			13	22
Given birth			7			12	19
Migrated			2			1	3
<b>Eligible CPW for 3<sup>rd</sup> month supply and their preference</b>	-	-	34	-	-	41	75
<b>CPW who completed the 3<sup>rd</sup> month</b>	2	26	28	11	23	34	62
<b>CPW unable to complete 3<sup>rd</sup> month</b>		6				7	13
Given birth		5				4	9
Illness/FCHV advised not to take		1				3	4

**Table 4** details summarize participant attrition during the course of the study and the reasons for discontinuation/dropout.

**Table 4. Participant Attrition and Reasons during Study Period**

CATEGORY	TITIHERIA	UDARAPUR	TOTAL
TOTAL PARTICIPANTS ENROLLED	43	54	97
TOTAL PARTICIPANTS COMPLETED 3 MONTHS	28	34	62
TOTAL PARTICIPANT ATTRITION	15	20	35
Delivered before third month	7	12	19
Delivered during third month	5	4	9
Lost to follow up (migrated out)	2	1	3
Stopped taking due to illness	1	3	4

Similarly, 17 (71%) out of 24 husbands and 18 (72%) out of 25 mother in laws included in the first phase were interviewed in the second phase. Almost all the FCHVs (n=32) and health staff (n=7) working in the SHP of the two VDCs were also interviewed in the second phase of the study.

As in the first phase of the study, two FGDs were conducted among the CPW in the second phase (**Table 5**).

**Table 5. Distribution of Respondents by Type in the First and Second Phases of the Study**

	RESPONDENT TYPE	TITEHERIYA VDC		UDHARAPUR VDC		TOTAL	
		FIRST PHASE	SECOND PHASE	FIRST PHASE	SECOND PHASE	FIRST PHASE	SECOND PHASE
<b>1</b>	<b>Interview with:</b>						
	▪ Husbands	10	6	14	11	24	17
	▪ Mothers-in-law (MIL)	11	8	14	10	25	18
	▪ Female community health volunteers (FCHV)	-	15	-	17	-	32
	▪ SHP staff	-	5	-	2	-	7
<b>2</b>	<b>FGDs with CPW</b>	1	1	1	1	2	2

## 2.2 CHARACTERISTICS OF THE RESPONDENTS

The age of the CPW included in the first phase of the study ranged from 17–42 years with median age of 23 years. In the second phase, the median age was 23 years. T-test showed no significant difference on the age distribution across the CPW of two phases ( $p=0.73$ ). Nearly three-quarters (71%) of the 97 women belonged to 20–29 age group.

Because the study was conducted in the Terai, Tharu (27%) and Muslim (25%) respondents were prevalent. Brahmin/Chhetry (13%) and Dalit (13%) were the other notable groups. Nearly 3-in-10 women were reported to be illiterate. Less than half (42%) of the women had ever attended school (**Table 6**).

The majority (67%) of the husbands of the CPW were below 30 years of age and most (84%) of the MIL of the CPW were between 40–59 years old.

**Table 6. Distribution of CPW by Age, Ethnicity and Literacy Status**

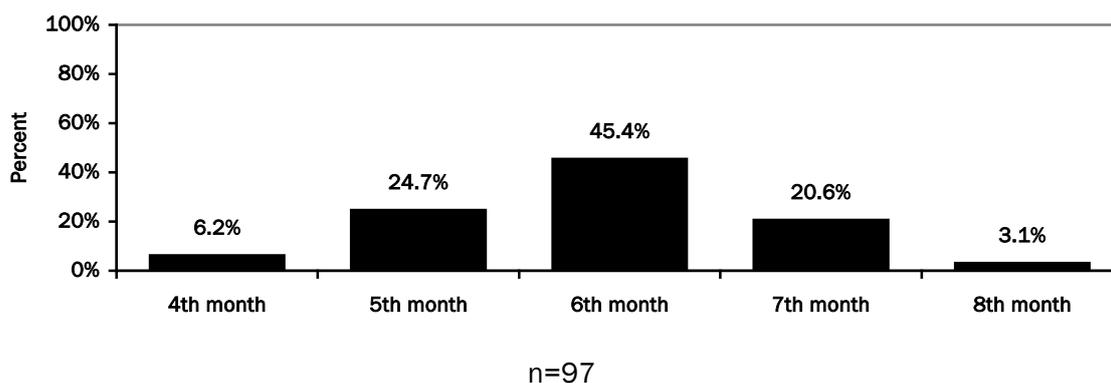
DESCRIPTION	%	NUMBER
<b>Age of respondent (in completed years)</b>		
<20 years	12.4	12
20–24 years	48.5	47
25–29 years	22.7	22
30 years +	16.5	16
<b>Median (SD)</b>	<b>23.0</b>	<b>(4.78)</b>
<b>Caste or ethnicity</b>		
Brahmin/Chhetri	13.4	13
Tharu	26.8	26
Muslim	24.7	24
Dalit	13.4	13
Other*	21.6	21
<b>Literacy status</b>		
Illiterate	57.7	56
Literate	42.3	41
<b>Level of education</b>		
No schooling	57.7	56
Some primary	9.3	9
Some secondary	20.6	20
SLC or above	12.4	12
<b>Total</b>	<b>100.0</b>	<b>97</b>

\*Other includes: Bahaut/Magante; Magar; Aahir/Yadav; Badhai; Sanyasi; Sonkhar/Khatik; Tamoli (Barai); Kurmi; Pasi/Dusad

Two FGDs of participating pregnant women were conducted in each VDC and in each phase (total of 4 FGDs). The FGD consisted primarily of Dalit, Muslim, Tharu and Brahmin/Chhetri women. All together 31 CPW housewives between 20–24 years of age, belonging to agriculture occupation were participated in the FGD to share their views in group settings.

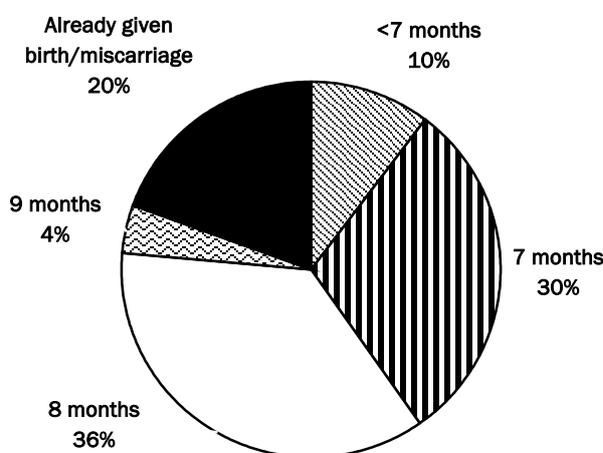
Although the study protocol set enrollment from five months (20 weeks), most pregnant women started taking calcium in their sixth month (**Figure 2**).

Figure 2. Percent Distribution of CPW by Months of Beginning Consuming Calcium during Their Current Pregnancy



Two-thirds (66%) of the respondents reported that they were in their seventh or eighth months of pregnancy at the time of first phase survey (end of two months). A notable proportion (20%) had already given birth at the time of the first phase survey (end of two months), indicating that some women either delivered quite early or had first received the calcium supplements during their third trimester of the pregnancy (Figure 3).

Figure 3. Percentage of CPW by Duration of Pregnancy



## 2.3 KNOWLEDGE ABOUT CALCIUM SUPPLEMENTATION

In the first phase of study data collection, all three categories of respondents (CPW, husbands and MIL) were asked about the type of danger signs and complications that could potentially be prevented from the use of calcium during pregnancy. Nearly three-quarters (72%) of the CPW were aware that use of calcium supplements during pregnancy can prevent: severe headache and convulsion or fits (72% each); 42% abdominal pain; and 28% blurred vision.

The level of knowledge was much higher among CPW than their husbands and MIL. Nearly half of the husbands and MIL did not know of any danger signs during pregnancy that could be prevented from the use of calcium. Over 75% of the pregnant women—compared to 25% husbands and 40% of MIL—had knowledge about at least two out of four danger signs addressed in the BCC materials (Table 7).

**Table 7. Percent Distribution of CPW, Husbands and MIL by Knowledge about the Danger Signs that can be Prevented from the Use of Calcium**

TYPE OF DANGER SIGNS THAT CAN BE PREVENTED FROM THE USE OF CALCIUM (MULTIPLE RESPONSE)	CPW	HUSBAND	MIL
	(n=97)	(n=24)	(n=25)
Severe headache	72.2	20.8	28.0
Convulsion and fit	72.2	29.2	40.0
Upper abdominal pain	42.3	16.7	20.0
Blurred vision	27.8	12.5	20.0
<b><i>Knew two or more</i></b>	<b>76.3</b>	<b>25.0</b>	<b>44.0</b>
Swelling of hands and legs	13.4	-	-
Dizziness	7.2	-	-
Other*	11.3	4.2	12.0
Do not know	9.3	58.3	40.0

\* Other includes: prevents postpartum hemorrhage; give strength; prevents from body swelling; weakness

Those who knew at least one danger sign that could be prevented from the use of calcium were further asked about the reasons it is important to prevent these danger signs during pregnancy. In response, majority of the respondents of all three categories reported that this would help reduce the risk of mothers' and babies' dying (**Table 8**). The responses indicate the presences of good levels of knowledge among the CPW and their family members about the importance of using calcium during pregnancy.

**Table 8. Percent Distribution of CPW, Husbands and MIL by Knowledge about Importance of Preventing Danger Signs during Pregnancy**

REASONS FOR BEING IMPORTANT TO PREVENT DANGER SIGNS AND SYMPTOMS DURING PREGNANCY (MULTIPLE RESPONSE)	CPW	HUSBAND	MIL
To reduce the risk of mothers' death	92.0	100.0	86.7
To reduce the risk of baby's death	79.5	60.0	73.3
Other (to increase child's weight)	-	-	6.7
<b>Total (n)</b>	<b>88</b>	<b>10</b>	<b>15</b>

When asked for how many months a pregnant woman should take calcium, a majority (74%) of the CPW correctly said that it should be taken for three months—but less than a quarter (21–24%) of the husbands and MIL correctly answered. About two-fifths of the husbands and MIL and one-fifth of the CPW reported that consumption of the calcium should be continued until the delivery of baby (**Table 9**).

**Table 9. Distribution of CPW, Husbands and MIL by Knowledge about Duration and Timing of Consuming Calcium during Pregnancy**

DESCRIPTION	CPW	Husband	MIL
	(n=97)	(n=24)	(n=25)
<b>Number of months a pregnant woman should take calcium</b>			
2	-	-	8.0
3 (correct answer)	74.2	20.8	24.0
4	1.0	4.2	-
Until the baby is delivered	19.6	37.5	40.0
Do not know	5.2	37.5	28.0
<b>From which month of pregnancy should a woman start to consume calcium? (months of pregnancy)</b>			
4	4.1	4.2	-
5 (correct answer)	61.9	20.8	28.0
6	18.6	4.2	-
7	1.0	-	-
Do not know	14.4	70.8	72.0

According to study protocol, women should start consuming calcium from the beginning of the fifth month of pregnancy. To assess this knowledge, all three categories of the respondents were asked about the timing of initiating the consumption of calcium during pregnancy. More than three-fifths of the CPW compared to about a quarter of the husbands and MIL correctly reported that the consumption of calcium should start from the fifth month of pregnancy. Majority (>70%) of the husbands and MIL did not know in which month calcium should be started, indicating the need for informing the family members about the timing of initiating calcium during pregnancy (**Table 9**).

From calcium BCC materials and FCHV counseling, pregnant women were instructed to take either one powder packet or two tablets daily. Almost all (98%) the CPW had correct knowledge about the number of calcium tablets to be taken each day (two tablets), however only about half of family members (54% of husbands and 52% of MIL) knew the correct number of calcium tablets to be taken each day. Knowledge about the correct dose of powder (1 packet each day) was also higher among CPW (97%) than their husbands (75%) and MIL (80%). (**Table 10**)

**Table 10. Percent Distribution of CPW, Husbands and MIL by Knowledge about the Correct Dose of Calcium Tablets and Powder to be Consumed During Pregnancy**

DESCRIPTION	CPW	Husband	MIL
	(n=97)	(n=24)	(n=25)
<b>Number calcium tablets a woman should take each day</b>			
Two tablets (correct answer)	97.9	54.2	52.0
One tablet	1.0	16.7	8.0
Do not know	1.0	29.2	40.0
<b>Number of packets of calcium powder a woman should take each day</b>			
One small packet (correct answer)	96.9	75.0	80.0
Other	-	4.2	-
Do not know	3.1	20.8	20.0

In the first phase of the study, all pregnant women were asked about the frequency and timing of taking calcium tablets and powder. Almost all (99%) CPW were aware of the correct frequency of taking calcium in a day (once a day), but only 74% correctly gave the time of a day: in the morning after breakfast for calcium tablets or in the morning with breakfast for calcium powder. Specific to powder, over 9-in 10 women correctly knew that calcium powder should be taken mixed with food (**Table 11**).

Overall, CPW were knowledgeable about how and when to take calcium during pregnancy.

**Table 11. Distribution of CPW by Knowledge about Frequency and Timing of Taking Calcium Tablets and Powder**

DESCRIPTION	%	NUMBER
<b>Number of times a day should a woman take calcium</b>		
One time (correct answer)	99.0	96
Two times	1.0	1
<b>Total</b>	<b>100.0</b>	<b>97</b>
<b>Timing of taking calcium tablets</b>		
In the morning after breakfast (correct answer)	74.2	72
After meal	24.7	24
Do not know	1.0	1
<b>Total</b>	<b>100.0</b>	<b>97</b>
<b>Timing of taking calcium powder</b>		
In the morning with the breakfast (correct answer)	74.2	72
With the meal	18.6	18
After meal	4.1	4
Do not know	3.1	3
<b>Total</b>	<b>100.0</b>	<b>97</b>
<b>Ways of taking calcium powder</b>		
Mixing with food (correct answer)	92.8	90
With water	2.1	2
Powder only	1.0	1
Sometime with food and sometime calcium only	1.0	1
Do not know	3.1	3
<b>Total</b>	<b>100.0</b>	<b>97</b>

## 2.4 CALCIUM PREFERENCE AND COMPLIANCE

One study objective is to examine the level of compliance over the full study period (90 days, 3 months). Data on compliance were collected in both the first and second phases.

### Initiation of Calcium

Overall 45% of the pregnant women in the first phase and 55% in the second phase reported that they started taking calcium tablets from the same day that they had received from the FCHVs. The percentage of women who started taking calcium powder from the same day increased from 28% in the first phase to 54% in the second phase (**Table 12**). Most of the women in the first phase started taking either the tablets or powder on the second day, while in the second phase a sizeable proportion of the women reported taking them after second or third day because they had received them before completing the remaining calcium from the first phase.

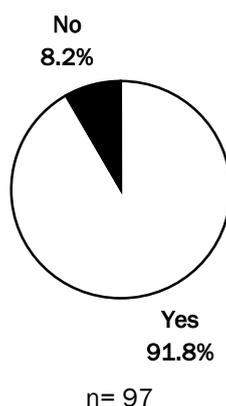
**Table 12. Percent Distribution of CPW by Initiation of Calcium Tablets and Powder in the First and Second Phase of the Survey**

DESCRIPTION	FIRST PHASE		SECOND PHASE	
	TABLETS	POWDER	TABLETS	POWDER
<b>Whether started taking the calcium from the same day when received</b>				
Yes	44.8	28.0	55.1	53.8
No	54.2	69.9	44.9	46.2
Not taken or consumed tablets due to delivery	1.0	1.1	-	-
<b>Total (n)</b>	<b>96</b>	<b>93</b>	<b>49</b>	<b>13</b>
<b>After how many days did you start taking the calcium?</b>				
1	71.2	77.3	36.4	50.0
2	15.4	7.6	18.2	-
3 days +	13.5	13.6	40.0	33.3
Not taken	-	1.5	4.5	16.7
<b>Total (n)</b>	<b>52</b>	<b>66</b>	<b>22</b>	<b>6</b>

### Calcium Preference

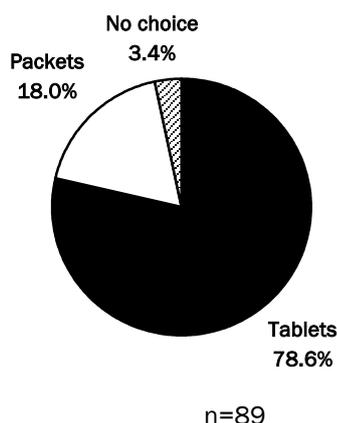
In the first phase, over 9-in-10 pregnant women reported that they are willing to take calcium for the next month (**Figure 4**), indicating interest in completing the full course of calcium.

**Figure 4. Percent Distribution of CPW by Their Willingness to Continue Taking the Calcium for another Month**



Among those CPW (92%) who were willing to continue taking calcium for another one month, a great majority (78%) said that they would like to continue taking tablets rather than powder. Only 18% preferred powder to calcium and a small proportion (3%) were indifferent (**Figure 5**). While discussing this during FGD among CPW, one of the CPW from Titeheria said, "For me tablet is better than the powder. I can easily swallow tablet with water without any hurdle. With the powder, I cannot take it at my own convenience because to take with food I have to wait my turn to eat after serving the meals to other family members".

Figure 5. Percent Distribution of CPW by Preferred Form of Calcium for another One Month



Those women who said they would like to continue taking a specific form of calcium (tablets or powder) for another one month were further asked as to why they would like to continue the specific form of calcium. As shown in **Table 13**, the main reason for continuing to use any form of calcium for another one month was easy to take (91% for tablet and 75% for powder) followed by good taste (20% for tablet and 50% for powder). Over 2-in-5 respondents also mentioned "no side effects" for preferring to continue the tablet form of calcium.

Table 13. Percent Distribution of CPW by Reasons for Preferring to Continue Specific Form of Calcium

REASONS FOR PREFERRING TO CONTINUE CALCIUM TABLET OR POWDER (MULTIPLE RESPONSE)	TABLET FORM	POWDER FORM	NO CHOICE	TOTAL
Easy to take	91.4	75.0	-	85.4
Good taste	20.0	50.0	33.1	25.8
No side effects	21.4	-	33.1	18.0
Other*	1.4	18.8	66.7	6.7
<b>Total (n)</b>	<b>70</b>	<b>16</b>	<b>3</b>	<b>89</b>

\*Other includes: less chance of forgetting to take it; it's a medicine; FCHV gave powder

At the end of the second month, participants were offered their choice of calcium (tablet or powder). At this point in time, only 75 PW were eligible to continue for the third month, because 19 had already given birth and 3 were migrated to another place among these 97 PW. Among 75 PW, 76% choosing tablets and 16% choosing powder, 5% CPWs decided not to continue taking calcium for the third month and 3% had no preference whatever given, they would like to continue (**Table 14**).

Table 14. Percent Distribution of CPW by their Preference of Calcium at the End of First Phase (n=75)

MONTH	TITEHERIA VDC			UDARAPUR VDC			BOTH VDC
	POWDER	TABLET	TOTAL	POWDER	TABLET	TOTAL	
PW Preference (#)	3	28	31	9	29	38	69
PW Preference (% by VDC)	8.8%	82.4%		22.0%	70.7%		
Whatever is given, no preference			0			2	2
Do not like to continue			3			1	4

## Compliance: Number of Days of Calcium Use in Each Study Phase

Compliance is defined as taking calcium for the full 90 days: 60 days in the first phase and 30 days in the second phase. Nearly three-quarters (70–72%) of the CPW in the first phase reported that they consumed the calcium tablets and powder for 30 prescribed days each. However, 3-in-10 women took less than the full 30 days of either form during the first phase.

In the second phase, the percentage of women who consumed calcium tablets for all 30 days increased to 82% in the second phase while no marked improvement was noticed in the compliance of calcium powder across the two phases (72% in the first phase and 69% in the second phase). Further exploring the reasons on calcium powder compliance, one participant from Titeheria VDC said, “It looks odd to open the calcium packet, sprinkle the powder on the food and then mixing before eating in front of the other members of the family. Uneasy feeling of the taste of the powder is another discomfort”.

**Table 15. Percent Distribution of CPW by Number of Days Calcium Taken in the Last Three Months**

NUMBER OF DAYS TAKEN	FIRST PHASE		SECOND PHASE	
	TABLETS	POWDER	TABLETS	POWDER
Less than 20 days	12.4	14.4	4.1	23.1
20–24 days	7.2	1.0	6.1	-
25–29 days	8.2	7.2	8.2	7.7
30 days (full compliance)	70.1	72.2	81.6	69.2
Have not received or not taken	2.1	5.2	-	-
<b>Total (n)</b>	<b>97</b>	<b>97</b>	<b>49</b>	<b>13</b>

## Missed Days of Calcium

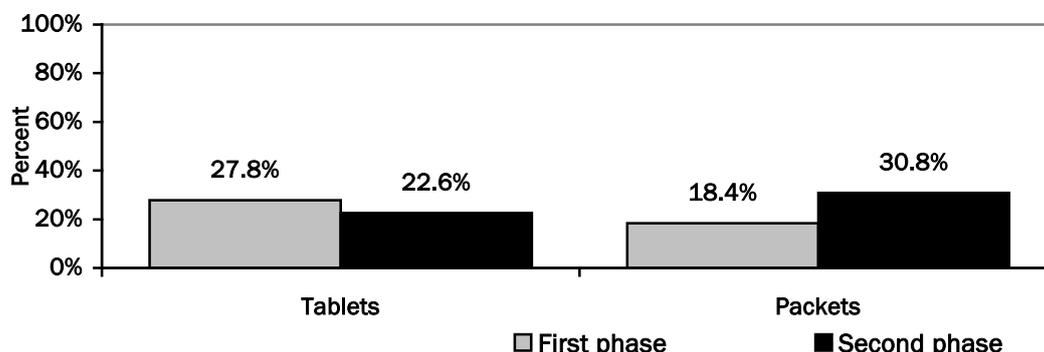
Out of the 97 CPW in the first phase, 95 and 92 women respectively reported receiving prescribed number of tablets (60) and packet of powder (30). Similarly, in the second phase, out of the 62 women who completed the full third month, all CPW received the prescribed amount of their preferred form.

In both phases, all CPW were asked if they had missed taking calcium tablets or powder any day. In the first phase, 27.8% of the CPW reported that they missed taking calcium tablets any day and 22.6% reported that they missed taking calcium powder.

In the second phase, the proportion of women who missed taking the tablets reduced by 9% and the proportion of women who missed taking the powder increased by 8% (**Figure 6**). Those who missed were further asked about the number of days they missed taking the calcium. The number of days missed taking calcium tablets (2–6 days) and powder (2–4 days).

These findings on missed days in both phases are inconsistent with CPW reported compliance (**Table 15**). The findings (**Figure 6**) indicate that women either developed the habit of daily calcium consumption by the third month or are more likely to take calcium daily when they have selected their preferred form.

**Figure 6. Percentage of CPW Who Ever Missed Taking Calcium Tablets or Powder in the First and Second Phase of the Survey**



n= 95 for tablets and 92 for powder in the first phase and 49 for tablets and 13 for packets in the second phase

### Use of Calcium from Missed Days

In both phases, women who missed taking either the tablets or powder were further asked about what they did with the missed doses (**Table 16**). Most of the women in the first phase reported that they did nothing with the unused tablets (67%) and powder (51%), while in the second phase most of the women reported taking the missed tablets (86%) and powder (67%) in later days. Few (6%) returned the unused calcium to FCHVs.

**Table 16. Percent Distribution of CPW by Utilization of Missing Calcium Tablets and Powder**

WHAT DID YOU DO WITH THE TABLETS THAT YOU MISSED TAKING?	FIRST PHASE		SECOND PHASE	
	TABLETS	POWDER	TABLETS	POWDER
Did nothing	66.7	51.0	14.3	33.3
Taken two doses on the next day	9.1	-	-	-
Taken later	15.2	40.8	85.7	66.7
Currently taking	9.1	-	-	-
Returned to FCHV	-	6.1	-	-
Thrown them away	-	2.0	-	-
<b>Total (n)</b>	<b>33</b>	<b>49</b>	<b>14</b>	<b>3</b>

### Compliance: Number of Doses of Calcium in Each Study Phase

Among the women who received the full amounts of tablets and powder packets, these women were asked about the number of tablets and powder they consumed during the first and second phases of the study (**Table 17**). Full compliance for first phase was 60 tablets (2/day, 30 days) and 30 powder packets (one/day, 30 days); for the second phase depending on their choice, either 60 tablets (2/day, 30 days) or 30 powder packets (one/day, 30 days).

The compliance of tablet doses was much higher in both phases than that of powder. For instance, 63% of the CPW in the first phase and 80% in the second phase reported taking all tablets while the corresponding figures for the powder were 47% and 69%.

Compliance in the second phase increased for both forms, with more women who chose tablets completing the full course (60 tablets).

**Table 17. Percent Distribution of CPW by Number of Calcium Tablets and Powder Taken in the Last Three Months**

NUMBER OF CALCIUM TABLETS/POWDER	FIRST PHASE		SECOND PHASE	
	TABLETS	PACKETS	TABLETS	PACKETS
Less than 50 tablets/less than 25 packets	26.3	25.0	12.2	23.1
50–59 tablets/25–29 packets	10.5	28.3	8.2	7.7
60 tablets/30 packets	63.2	46.7	79.6	69.2
<b>Total (n)</b>	<b>95</b>	<b>92</b>	<b>49</b>	<b>13</b>

### Reasons for Missed Doses

Those CPW who did not consume the recommended number of doses of calcium tablets or powder were further asked about the reasons for not consuming the complete dose of calcium. The most frequently cited reason was forgetfulness; other reasons mentioned were some side-effects, being away from home, birth of the baby and delay in getting tablets or powder. Specific to tablets, reasons include delay in receiving calcium and difficulty in taking two tablets at one time. Specific to powder, the main reason given was it spoiled the taste of food (**Table 18**).

**Table 18. Percent Distribution of CPW by Reasons for Not Taking the Complete Dose of Calcium Tablets and Powder**

REASONS FOR NOT TAKING ANY/SOME OF THE CALCIUM TABLETS/POWDER (MULTIPLE RESPONSE)	FIRST PHASE		SECOND PHASE	
	TABLETS	POWDER	TABLETS	POWDER
Forgot to take it	60.0	57.1	50.0	-
Family members did not allow	2.9	-	-	-
Inconvenient to take every day	5.7	-	-	-
Thought of affecting the unborn baby	2.9	4.1	-	-
Away from home	8.6	6.1	10.0	25.0
Calcium spoils the taste of foods	-	18.4	-	-
Was experiencing symptoms that the woman attributed to the calcium	8.6	14.3	-	-
Difficulty taking the calcium e.g. due to tablet size	11.4	-	-	-
Still taking powder	2.9	-	22.0	-
Bad taste	-	16.3	-	-
Due to delay in getting tables still consuming it	11.4	-	10.0	-
Already given birth/miscarriage	5.7	8.2	22.0	75.0
Taken one tablet at a time/ taken only one tab	11.4	-	-	-
Other*	11.4	2.0	11.0	-
<b>Total (n)</b>	<b>35</b>	<b>49</b>	<b>10</b>	<b>4</b>

\*Other includes: not received tablets; forget to take with me while going to parents house; due to dental problems; family members opposed

## Use of Calcium from Missed Doses

To the question *what did you do with the left over tablets or packets*, over 60% of the women in the first phase and 90% in the second phase reported that they were still holding the remaining tablets. Most (57%) of the women in the first phase took the leftover calcium powder on later days while half of the women in the second phase reported that they were still holding the unused packets. Data presented in **Table 19** shows that only a few women in both phase had returned the unused tablets and powder to the FCHVs.

**Table 19. Percent Distribution of CPW by Ways of Handling the Leftover Calcium**

WHAT DID YOU DO WITH THE LEFTOVER TABLETS?	FIRST PHASE		SECOND PHASE	
	TABLETS	PACKETS	TABLETS	PACKETS
It is with me	60.0	26.5	90.0	50.0
Thrown away	5.7	4.1	10.0	25.0
Returned to FCHV	8.6	12.2	-	25.0
Still taking	11.4	-	-	-
Taken later	11.4	57.1	-	-
Left in parent's home	2.9	-	-	-
<b>Total (n)</b>	<b>35</b>	<b>49</b>	<b>10</b>	<b>4</b>

Almost all the women (97%) in the first phase and all the women in second phase reported they consumed calcium tablets daily. Similarly, 92% of the women in the first phase and all the women in the second phase reported that they consumed the required number of two tablets each time. A small portion of the women took one tablet for the first couple of weeks and two tablets for rest of the weeks (**Table 20**). Among those (n=8) who did not consume two tablets each time were also asked about the reasons for not consuming two tablets each time. Lack of knowledge, difficulty in swallowing two tablets at once, fear of side effects and forgetfulness were the main reasons for not consuming two tablets each time.

## Practice: Frequency and Timing of Taking Calcium Tablets and Powder

To avoid any interaction with iron supplements taken in the evenings, women were educated to take calcium in the morning with food (either with breakfast or morning meal). Among the different ethnic groups in this study, there are different eating habits in the morning. Some groups had a small breakfast (tea and a small amount of food) early in the morning followed by a large hot meal in the late morning. Others had nothing in the early morning (no breakfast) but instead take their large, hot meal in the mid-morning.

For calcium tablets, women were told to take them in the morning after breakfast. About 6-in-10 women in both phases reported that they took calcium tablets at the recommended time of the day. Women who did not consume tablets in the morning after breakfast were further asked about the reasons for not doing so, citing: no practice of taking breakfast; lack of knowledge; and inconvenience (**Table 20**).

**Table 20. Percent Distribution of CPW by Frequency of Taking Calcium Tablets in the First and Second Phase of the Survey**

DESCRIPTION	FIRST PHASE	SECOND PHASE
<b>Frequency of taking calcium tablets</b>		
Every day	96.8	98.0
Sometime forget to take it; forget to take for two days; three days only	3.2	-
Not taken at all	-	2.0
<b>Total (n)</b>	<b>95</b>	<b>49</b>
<b>Number of calcium tablets taken each time</b>		
Two tablets	91.6	100.0
Taken one tablet each for 20 days and 2 tablets for remaining days; taken one tablet each for 13 days and 2 tablets for remaining days	7.4	-
Other (taken four tablets in two days)	1.1	-
<b>Total (n)</b>	<b>95</b>	<b>48</b>
<b>Timing of taking calcium tablets</b>		
In the morning after breakfast	66.3	58.3
After morning meal	33.7	41.7
<b>Total</b>	<b>95</b>	<b>48</b>
<b>Reasons for not taking calcium tablets in the morning after breakfast (Multiple Response)</b>		
No practice of taking breakfast; no money for breakfast; ease to take with meal	46.9	55.0
Do not know that it should be taken in the morning after breakfast	40.6	25.0
Forgot to take	-	5.0
Inconvenient to take in the morning after breakfast	25.0	15.0
<b>Total (n)</b>	<b>32</b>	<b>20</b>

For calcium powder, all except one respondent in each phase reported that they consumed calcium powder daily. About 7-in-10 women in both phases reported taking the calcium powder as instructed, in the morning with the breakfast. About one-third of the women in both phase reported taking calcium powder in the morning with the meal. The proportion of women taking calcium powder in the recommended time was slightly less in the second phase than in the first phase. It seems that all respondents who consumed calcium powder did so in the morning and the only difference was that the calcium was taken either with the breakfast or the morning meal. A considerable proportion of the women were not habituated in taking breakfast, instead taking a morning meal. The main reason for not taking the powder as recommended in the morning with breakfast was that one-third to one fourth of the women did not know that calcium powder should be taken with breakfast and one-fourth found it inconvenient (Table 21).

**Table 21. Percent Distribution of CPW by Frequency of Taking Calcium Powder in the First and Second Phase of the Survey**

DESCRIPTION	FIRST PHASE	SECOND PHASE
<b>Number of calcium packets taken each time</b>		
One packet	98.9	92.3
Not taken at all	1.1	7.7
<b>Total (n)</b>	<b>92</b>	<b>13</b>

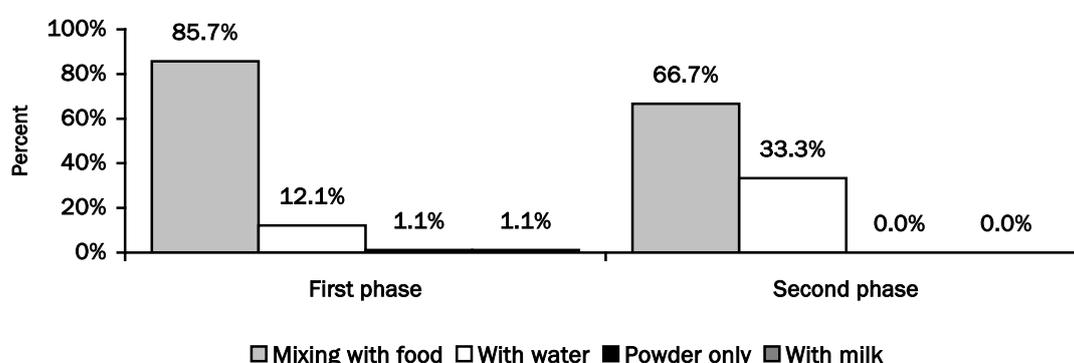
**Table 21. Percent Distribution of CPW by Frequency of Taking Calcium Powder in the First and Second Phase of the Survey**

DESCRIPTION	FIRST PHASE	SECOND PHASE
<b>Timing of calcium powder</b>		
In the morning with the breakfast	70.3	66.7
In the morning with meal	29.7	33.3
<b>Total (n)</b>	<b>91</b>	<b>12</b>
<b>Reasons for not taking calcium powder in the morning after breakfast (Multiple Response)</b>		
No practice of having breakfast/no money for breakfast	40.7	25.0
Do not know that it should be taken in the morning with the breakfast	33.3	25.0
Forgot to take	-	-
Inconvenient to take in the morning with the breakfast	25.9	25.0
Calcium spoil the taste of foods	3.7	25.0
<b>Total (n)</b>	<b>27</b>	<b>4</b>

The participants from FGDs viewed that it would be better to take calcium at any time in a day without restricting. Some felt that calcium should be taken at a fixed time every day to reduce the chance of forgetting to take it.

The calcium powder was expected to be consumed mixed with food and nearly 86% of the CPW in the first phase and two-thirds (67%) in the second phase followed these instructions. A small proportion (12%) of the women in the first phase and one-third in the second phase took the powder with water. Although not part of the instructions, this is also an acceptable way to take the powder (**Figure 7**). Among those (n=13 in first and 4 in second phase) who did not consume powder mixed with food, 11 women in the first phase and all in the second phase did so complaining that it spoiled the taste of food. Nausea (n=2), lack of knowledge (n=1) and inconvenient to mix (n=1) were reasons mentioned for mixing the powder with food.

**Figure 7. Percentage of CPW by Ways of Ingesting the Calcium Powder**



n= 91 in first phase and 12 in second phase

### Full Compliance during Both Study Phases: Days and Doses

**Table 22** summarizes the compliance of calcium tablets and powder for the full 90 days in terms of duration and quantity of calcium consumed by the CPW. Of the 97 women recruited in the piloting, 35 women had either given birth or were lost to follow up due to

migration. Thus, only 62 women were considered to be eligible for the calculation of the compliance of the calcium.

Slightly over half (52%) of the women had consumed the calcium tablets or powder for 90 days and a quarter (24%) had consumed for 80–89 days. In terms of doses, only one-third (32%) had consumed the complete doses (90 doses) and nearly 3-in-10 had consumed 80–89 doses and another 4-in-10 had consumed less than 80 doses. This indicates while over half the women took calcium every day, they did not always take the full dose.

**Table 22. Percent Distribution of CPW by Number of Days and Doses They Consumed the Calcium Supplements over 90 Days**

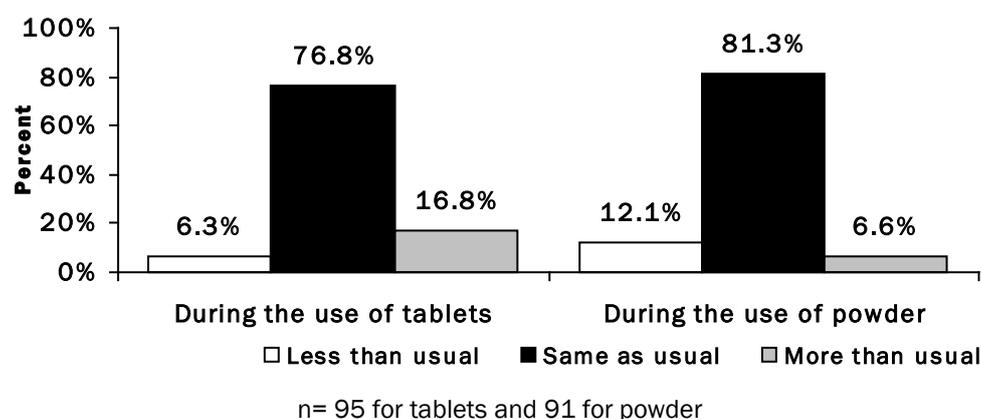
NUMBER OF DAYS OR DOSES CONSUMED	NUMBER OF DAYS CONSUMED		NUMBER OF DOSES CONSUMED (TABLETS OR POWDER)	
	%	NUMBER	%	NUMBER
Less than 80	24.2	15	38.7	24
80–84	8.1	5	14.5	9
85–89	16.1	10	14.5	9
90	51.6	32	32.3	20
Mean (SD)	82.3	(13.1)	79.2	(13.1)
Total	100.0	62	100.0	62

### Food Consumption during the Use of Calcium

Normally pregnant women were expected to eat same or more than usual amount of food while they were on calcium tablets. In this respect, the responding women were asked about the amount of food they consumed during the use of tablets and powder. **Figure 8** shows the majority of the women reported that they consumed same as usual or more than usual amount of food during the use of calcium tablets (94%) and during the use of calcium powder (88%). Only 6 and 11 women respectively reported eating less food than usual while taking calcium. This indicates use of calcium tablets or powder has no negative effect on food consumption.

Women who reported using less food were further asked about the reasons for eating less amount of food, citing a lack of the appetite as the main reason.

**Figure 8. Percent Distribution of CPW by Amount of Foods Consumed during the Use of Tablets and Powder**



Pregnant women included in both phases were asked about type of foods they consumed during their pregnancy. Specific food items were read out by the interviewers. Nearly all the women reported consuming green vegetables (97% in first and 99% in second phase) and milk and other dairy products (96% in first and 96% in second phase). Eggs and

meat products were consumed by 84% to 99% of the pregnant women. Consumption of fruit was low in the first phase (60%) but increased in the (81%) in the second phase (**Table 23**).

**Table 23. Percent Distribution of CPW by Type of Foods Consumed during Their Pregnancy by Phase of Survey**

TYPE OF FOOD ITEMS CONSUMED	FIRST PHASE (N=97)	SECOND PHASE (N=75)
Green vegetables	96.9	98.7
Milk and other dairy products	95.9	98.7
Meat/fish	87.6	89.3
Eggs	83.5	89.3
Fruits	59.8	81.3
Mushroom	1.0	-

Participants of FGDs revealed that certain foods were restricted for pregnant women such as alcohol, smoking, chilies, sour food, too greasy foods, tomatoes, pork and certain medicines. Beliefs are these foods/medicine might result in miscarriage, birth of a handicapped baby, coagulation of blood, catching a cold and edema of hands and feet.

## 2.5 SIDE EFFECTS FROM CALCIUM

All pregnant women were asked if they had ever experienced any side effects from the use of calcium tablets or powder. Associated with tablets, only 5% of the women in the first phase experienced some side effects due to the use of calcium tablets, and none in the second phase. Reported tablet side effects include belching, loss of appetite and lack of movement of fetus.

More women reported side effects from the calcium powder, although it decreased from first to second phase surveys (21% to 8%). The most frequently cited side effects from the use of powder were nausea/vomiting followed by belching and heaviness in the stomach. Some women also complained of having constipation due to the use of powder (**Table 24**). A few participants of FGD also mentioned the powder causes a sticky feeling in the mouth and loss of interest in foods.

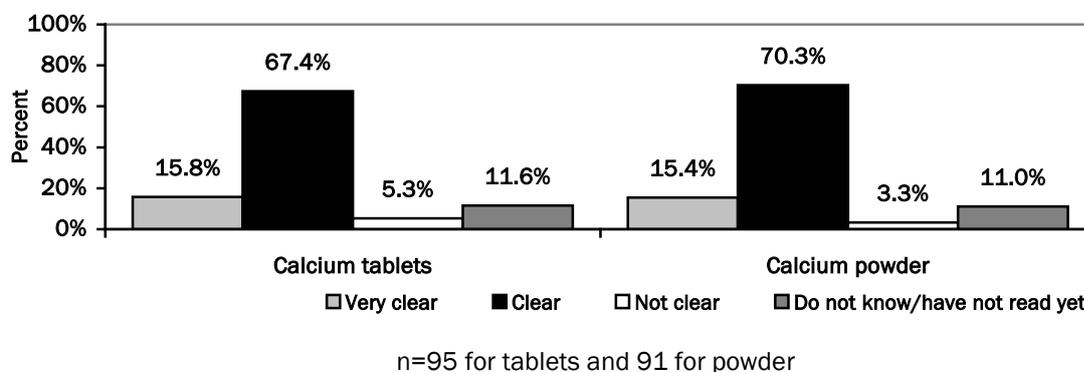
**Table 24. Percent Distribution of CPW Experiencing Side-effects from the Use of Calcium Tablets and Powder**

DESCRIPTION	FIRST PHASE		SECOND PHASE	
	TABLETS	POWDER	TABLETS	POWDER
<b>Ever experienced any side effects or problems from the use of calcium tablets</b>				
Yes	5.3	20.9	-	8.3
No	94.7	79.1	100.0	91.7
<b>Total (n)</b>	<b>95</b>	<b>91</b>	<b>48</b>	<b>12</b>
<b>Type of problems experienced (Multiple response)</b>				
Belching or gas in stomach	20.0	21.1	-	100.0
Heaviness in stomach	-	15.8	-	-
Constipation	-	5.3	-	-
Nausea	-	63.2	-	-
Less appetite; no movement of fetus	80.0	10.5	-	-
<b>Total (n)</b>	<b>5</b>	<b>19</b>	<b>NA</b>	<b>1</b>

## 2.6 CLARITY OF INSTRUCTIONS

To increase the knowledge of and compliance to calcium consumption, instructions were included in the packets of calcium tablets and powder. Opinions of respondents regarding the clarity of instructions given about calcium tablets or powder in the packet of leaflets were obtained by showing the instruction materials. Only a small proportion (15%) of the women expressed that the instructions were very clear while a majority (67–70%) said it was clear. The proportion of those reporting the instructions, not clear, found to be negligible (Figure 9).

Figure 9. Percent Distribution of CPW by Opinion Regarding the Clarity of Instructions Given About Calcium Tablets and Powder in the Packet or Leaflet



## 2.7 OPINIONS ON CALCIUM AND ITS DISTRIBUTION

### Calcium Size and Taste

The CPW were asked about their opinion regarding size/amount, taste, continuity of consumption of calcium in order to assess the status of acceptability of and compliance of calcium supplement.

Regarding the size of the calcium tablets, none felt they were too small in size. Half viewed that the size was just about right, and another half said they were too large. The proportion of the women who had opinion on the size of the tablets “just about right” increased slightly (3%) from the time of first to the second phase survey (Table 25).

Information obtained from the FGDs also shows that most of the participants were also not that critical about the size of the tablets as only a few had commented that the size felt a bit large.

Table 25. Percent Distribution of CPW by Opinion Regarding the Size of Calcium Tablets

OPINION ON THE SIZE OF THE CALCIUM TABLETS	FIRST PHASE	SECOND PHASE
Too small	-	-
Just about right	49.5	52.1
Too large	50.5	47.9
Total (n)	95	48

A great majority (84% in first and 92% in second phase) of the CPW expressed that the taste of calcium tablet was acceptable. Compared to the proportion of women accepting the taste of calcium tablets, the proportion of the women accepting the taste of calcium powder was found to be less (46% in first and 32% in second phase).

Despite the differences in acceptability of taste of two forms of calcium, a slight majority (64% in first and 52% in second phase) of the women expressed it was not needed to change the taste of calcium (Table 26).

**Table 26. Percent Distribution of CPW by Opinion Regarding the Taste of the Calcium Tablets and Powder**

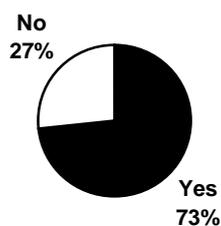
DESCRIPTION	FIRST PHASE (n=97)	SECOND PHASE (n=75)
<b>Whether the taste of calcium tablets acceptable or not</b>		
Acceptable	83.5	92.0
Not acceptable	14.4	8.0
Not taken	2.1	-
<b>Whether the taste of calcium powder acceptable or not</b>		
Acceptable	46.4	32.0
Not acceptable	47.4	66.7
Not taken	6.2	1.3
<b>Whether the taste of the calcium be changed</b>		
Yes	36.1	48.0
No	63.9	52.0

Women in FGD did not find problem with taste of calcium tablets, since it was taken with water they had hardly had time to judge the taste. However, some of the women indicated of unfavorable taste of calcium powder while consuming together with the food. In this respect, one participant added “*When I took powder mixing with rice it tasted like chalk and I felt nausea, in addition the rice became sticky. Anyway I swallowed the powder with water*”. Opinion of some participants of FGDs was that it would be better if the taste of calcium powder was made sweet.

### Calcium for Future Use and Recommendations to Others

When further asked about the willingness to take calcium if they get pregnant in the future nearly all the CPW (98%) in both phases said that they would like to take calcium

**Figure 10. Percent Distribution of Respondents by Their Preference of Any Form of Calcium**

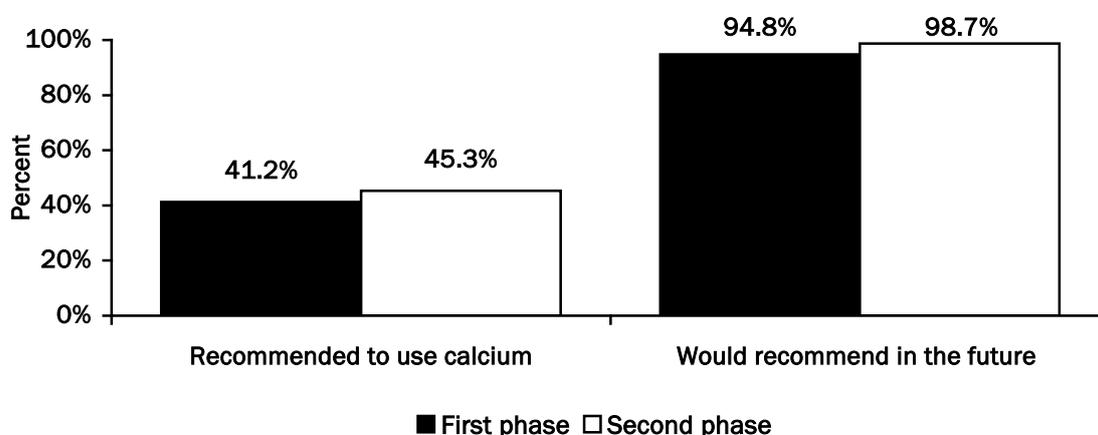


n=75

in the future. After gaining experience in using with calcium for about three months, in the second phase a majority (73%) of the women expressed that they would accept any form of calcium if they could not get the preferred form (Figure 10).

All pregnant women included in both study phases were asked if they had recommended others to use calcium. More than 2-in-5 women in both phase with a higher proportion in the second phase reported to have recommended other pregnant women to use calcium. When further asked if they would like recommend other pregnant women to use calcium in the future, an overwhelming majority (95% in first phase and 99% in second phase) of responded affirmatively i.e. they would like to recommend to other pregnant women in the future (Figure 11). This indicates the acceptability of calcium.

**Figure 11. Percentage of CPW Recommending Other Pregnant Women to Use Calcium**



This recommendation was confirmed by the FGD participants; over half reported that they had recommended other pregnant women of their areas to take the calcium. They said they would like to recommend calcium to the other pregnant women. Most would recommend calcium tablets.

Though a substantial proportion of husbands/MILs did not have correct knowledge about how and when to take calcium, an overwhelming proportion (96% husbands and 76% MIL) were aware of the importance of taking calcium during pregnancy. This indicates that family members are also well aware about the importance of taking calcium supplements during pregnancy.

When further asked about the reasons for recommending other pregnant women to use calcium in the future, most of the CPW (60% in first phase and 41% in second phase) stated that it would be good for health of the mother as well as the baby. A sizeable proportion (20% in first phase and 30% in second phase) of the mothers would recommend calcium because it would help make children's bone strong and also prevent from various danger signs during reproductive period. A few of the women mentioned that use of calcium would prevent pre-eclampsia danger signs (dizziness, swelling of hands and feet and headache). The proportion of CPW who gave reasons for recommending the calcium supplement increased slightly in the second phase (Table 27).

Among the few CPW who would not recommend calcium (5 women in first phase and 1 woman in second phase), reasons given were: they did not have adequate knowledge about the calcium, followed by lack of frequent meetings with others. The FGD results indicate that these reasons may be because Muslim women were restricted to come out from households or there were not many pregnant women in their area to recommend calcium.

**Table 27. Percent Distribution of CPW by Reasons for Recommending Other Pregnant Women to Use Calcium in the Future**

REASONS FOR RECOMMENDING OTHER PREGNANT WOMEN	FIRST PHASE	SECOND PHASE
Good for mother and child's health; prevents mother and child from illness	59.8	40.5
Prevents from different danger signs; prevents from convulsions	22.8	27.0
Helps make children's bones strong; good for child's health; prevents children from death risk	19.6	29.7
Prevents from headache	14.1	28.4
Prevents from dizziness	9.8	12.2
Prevents from hands and legs swelling	8.7	17.6
Other*	9.8	2.7
<b>Total (n)</b>	<b>92</b>	<b>74</b>

\*Other includes: prevents from anemia; it contains vitamin; prevents from eye problems; increases appetite; prevents from various diseases.

## Calcium Distribution

Opinion of the respondents on calcium distribution was also sought during the study. The FCHVs were primarily used to distribute the calcium supplement, and almost all (99%) the pregnant women still preferred this mode of calcium distribution. Almost all (97%) the husbands/MIL felt that FCHVs should continue distributing calcium. Most of the pregnant women included in the FGDs also supported distribution of calcium by FCHVs and some suggested inclusion of health workers from SHP and other female workers in the community as well.

## Storage of Calcium

Normally the calcium supplements should be stored in a shaded place away from direct sunlight. Most commonly (25%) women reported that in the first phase they stored in the cupboard; in the second phase in the bag. Few women in either phase reported difficulty in storing the calcium (7% in first phase and 4% in second phase) (**Table 28**). The main problems cited were lack of a suitable place and tendency of children to throw them away.

**Table 28. Percent Distribution of CPW by Place of Storing the Calcium Supplements and Problems Faced in Storing Them**

DESCRIPTION	FIRST PHASE	SECOND PHASE
<b>Place of storing the calcium</b>		
In the cupboard	24.7	13.3
In the bag	17.5	28.0
Under the roof ceiling	15.5	18.7
Place where sunshine is not there	14.4	13.3
In the box	11.3	10.7
In the small packet (Battama)	9.3	9.3
On the table	6.2	6.7
Under the mattress	1.0	-
<b>Total (n)</b>	<b>97</b>	<b>75</b>

**Table 28. Percent Distribution of CPW by Place of Storing the Calcium Supplements and Problems Faced in Storing Them**

DESCRIPTION	FIRST PHASE	SECOND PHASE
<b>Whether faced any difficulty in storing the calcium tablets/powder</b>		
Yes	7.2	4.0
No	92.8	96.0
<b>Total (n)</b>	<b>97</b>	<b>75</b>

## 2.8 FAMILY SUPPORT REGARDING CALCIUM USE

### Family Member Awareness and Support

Pregnant women were asked if any of their family members were aware about their consumption of calcium supplements. All the respondents stated that at least one member of their family were aware about it. Nearly 9-in-10 women reported that their husbands were aware about their consumption of calcium.

Similarly, nearly two-thirds and over a quarter of the respondents respectively reported that their MIL and fathers-in-law were also aware of their practices of consuming calcium. Such awareness might be needed to get support from the family to make the calcium consumption by the women a success (**Table 29**). Information obtained from FGDs also indicated that the family members including MIL were supportive of calcium consumption: CPW were reminded to take calcium.

This finding is consistent with the responses given by their husbands and MIL: over 9-in-10 husbands and MIL were aware that the FCHVs had provided the calcium to their wives/DIL. An overwhelming majority (83%) of husbands/MIL were aware of the month when their wives/DIL started taking calcium. Over half (58%) of the husbands and one-third (36%) of the MIL reported that their wives/DIL had talked to them before using the calcium.

**Table 29. Percent Distribution of CPW Reporting the Persons in Their Family Who were Aware about Their Consumption of Calcium Supplements; First Phase**

PERSONS IN THE FAMILY WHO KNOW ABOUT THE USE OF CALCIUM (MULTIPLE RESPONSE)	%	NUMBER
Husband	87.6	85
Mother-in-law	63.9	62
Father-in-law	27.8	27
Other family member	46.4	45
Relatives	17.5	17
<b>Total (n)</b>	<b>-</b>	<b>97</b>

An overwhelming proportion (94%) of the husbands/MIL perceived that consumption of calcium could be beneficial for both wife/DIL and the expected baby. In the first phase, 84% of husbands/MIL expressed that their wives/DIL should continue taking calcium. Likewise, one-fifth of the husbands/MIL during the first phase noted the pregnant women's resistance in taking calcium, but none of the husbands/MIL noted this resistance in the second phase.

In addition, around half the husbands/MIL advised their wives/DIL to complete the dose; appreciated calcium use and reminded them to take calcium. This proportion increased slightly during the second phase survey. A few had tried to support their wives/DIL by explaining them the instruction given in the calcium packets.

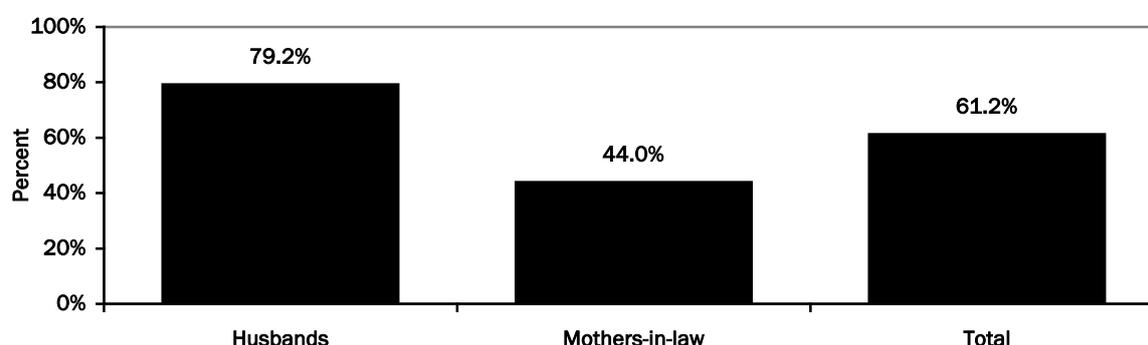
Information regarding type of support provided by the husbands/MIL to their wives/DIL were also collected from the husbands and MIL included in the study. Specific types of support expected to be given to the pregnant women were read out by the interviewers during interview. Overall, more than half (55%) of the respondents reported that they advised their wives/DIL to complete the recommended dose of calcium followed by about half reminded them to take calcium and appreciated them for consuming calcium supplements. Only a few of the respondents supported their wives/DIL by obtaining calcium supply from the FCHVs and reading out the instructions of packet or leaflet (Table 30).

**Table 30. Percent Distribution of Husbands and MIL by Type of Support Providing to Their Wives/DIL for Taking Calcium**

IN WHAT WAYS YOU ARE HELPING YOUR WIFE/DIL FOR TAKING CALCIUM? (READ ALL RESPONSES)	HUSBAND	MIL	TOTAL
	(n=24)	(n=25)	(n=49)
Advising her to complete the dose	66.7	44.0	55.1
Reminding her to take	58.3	48.0	53.1
Appreciating her taking it	58.3	40.0	49.0
Reading out instructions of packet or leaflet	25.0	4.0	14.3
Getting supplies from FCHV	16.7	8.0	12.2
Advice for check up	-	4.0	2.0

Husbands and MIL were also asked about their willingness to get calcium themselves for their wives/DIL. A higher proportion (79%) husbands than MIL (44%) were found willing to get calcium themselves for their wives/DIL (Figure 12). To get calcium, a great majority (77%) of the husbands/MIL would visit the FCHVs followed by 17% who would visit the health facilities. Among those husbands/MIL who were not willing to get calcium by themselves for their wives/DIL, a great majority (79%) gave the reason that their wives/DIL themselves could collect the needed calcium followed by lack of time to go for collecting the calcium.

**Figure 12. Percentage of Husbands and MIL Showing Willingness to Get Calcium for Their Wives/DIL**



n=24 husbands and 25 MIL

The calcium intervention relies on the FCHVs, so the nature of support provided to the pregnant women from the husbands/MIL depends largely upon their orientation of and interaction with the FCHVs. Except one MIL, all the husbands/MIL knew the FCHVs who were working in their area. More than 7-in-10 husbands/MIL also reported meeting the FCHVs during their wives/DIL's current pregnancy. Types of information and support they received with respect to the consumption of calcium supplements by their wives/DIL are as follows:

- Talked about the need for taking calcium by pregnant women (60%)

- Advised them to give calcium to their wives/DIL (60%)
- Informed that their wives/DIL were provided with calcium (60%)
- Advised to remind their wives/DIL to take calcium daily (57%)
- Asked about the status of calcium consumption by their wives/DIL (54%)
- Provided with calcium supplements to give their wives/DIL (23%)

Almost all the husbands/MIL (96%) in the first phase of the survey and all of them in the second phase was aware that their wives/DIL had visited a health facility for ANC during their recent pregnancy. However, a slightly more than a quarter of the husbands and MIL reported accompanying their wives/DIL to a health facility for an ANC visit in the first phase, but this increased by 18% in the second phase. Among those who did not accompany were further asked about the reasons for not accompanying during the ANC visit. The most frequently cited reasons for not accompanying included being too busy (44%), accompanied by somebody else and no need to do so.

### Suggestions for Community Support Regarding Calcium

The participants of FGDs suggested the following activities to be carried out to increase the awareness among the community people on the need for calcium consumption by the pregnant women:

- Provide education on calcium to the pregnant women in group gatherings and through various media, such as radio, TV, posters and other printed materials.
- Informing family members to support the pregnant women to consume calcium.
- Mobilizing FCHVs for awareness campaigns.

## 2.9 ANTENATAL CARE (ANC) AND DELIVERY SERVICES

This section describes the antenatal care behaviors of the women who enrolled for the calcium supplementation and examines whether consumption of calcium had any interference with the other antenatal service utilization behaviors.

### ANC Knowledge and Practice

Except one woman, all women reported visiting health facility for antenatal care during their recent pregnancy. In the second phase, nearly 3-in-5 women completed the minimum recommended frequency of four visits and over a quarter had visited three times (**Table 31**). This is higher than the national average as found in the 2006 NDHS where 26% of pregnant women receive no ANC and only 29% receive four or more ANC visits.

The respondents were also asked if they were advised by the health workers to take calcium supplements during their visit for antenatal services. In response, three-quarters of the women in the first phase and 82% in the second reported receiving advice from the health worker.

**Table 31. Percent Distribution of CPW Who Visited Health Facility to Receive ANC during Their Recent Pregnancy**

DESCRIPTION	FIRST PHASE	SECOND PHASE
	(N=96)	(N=74)
<b>Whether visited health facility for antenatal care</b>		
Yes	99.0	98.7
No	1.0	1.7

**Table 31. Percent Distribution of CPW Who Visited Health Facility to Receive ANC during Their Recent Pregnancy**

DESCRIPTION	FIRST PHASE	SECOND PHASE
	(N=96)	(N=74)
<b>Number of times visited for consultation/checkups</b>		
1	14.6	5.4
2	34.4	8.1
3	35.4	28.4
4+	15.6	58.1

Almost all (97%) the women in the first phase and all women in the second phase were taking iron supplement during their current pregnancy. This is higher than the national average as found in the 2006 NDHS where 59% of pregnant women reported taking iron tablets during their last pregnancy. More than 9-in-10 women reported that they started taking iron tablets within 3–5 months of the pregnancy. Almost all (97%) women in the first phase and all women in the second phase also reported that they took iron tablets in the evening.

A majority (87%) of the women in the second phase felt comfortable to take different type of tablets, namely iron and calcium everyday. When asked whether they had ever missed taking iron tablets during the consumption of calcium in the last 90 days, nearly 79% said that they had not missed taking iron during that period. Those who missed taking iron did so because of forgetfulness and non-availability of iron. Respondents were also asked if they had missed taking iron due to the consumption of calcium supplement. In response, none of the women said that they missed taking iron due to consumption of calcium currently. These findings indicate that calcium did not interfere with iron-taking behaviors.

**Table 32. Percent Distribution of CPW by Consumption of Iron Tablets during Their Recent Pregnancy**

DESCRIPTION	%	NUMBER
<b>Ever missed taking iron tablets during the consumption of calcium (in the last 90 days)</b>		
Yes	21.3	16
No	78.7	59
<b>Total</b>	<b>100.0</b>	<b>75</b>
<b>Reasons for missing to take the iron tablets (Multiple Response)</b>		
Forgot to take	87.5	14
Not available in time	6.3	1
Other*	12.5	2
<b>Total</b>	<b>-</b>	<b>16</b>
<b>Whether missed any doses of iron because of the complications of taking calcium at one time of the day and iron at another</b>		
Yes	100.0	16
No	-	-
<b>Total</b>	<b>100.0</b>	<b>16</b>

**Table 32. Percent Distribution of CPW by Consumption of Iron Tablets during Their Recent Pregnancy**

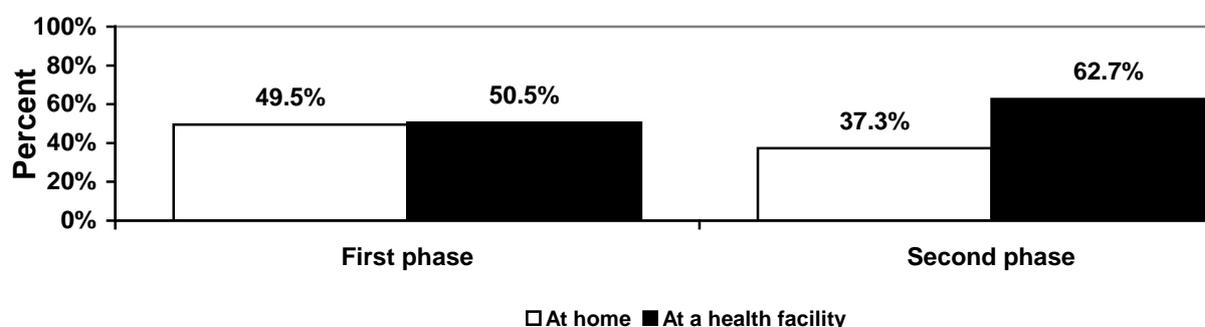
DESCRIPTION	%	NUMBER
<b>Whether feel comfortable to take different types of tablets (calcium and iron) everyday</b>		
Yes	86.7	65
No	13.3	10
<b>Total</b>	<b>100.0</b>	<b>75</b>
<b>More convenient and acceptable time to take iron and calcium tablets</b>		
At the same time	17.3	13
At different time	82.7	62
<b>Total</b>	<b>100.0</b>	<b>75</b>

\*Other includes: forgot to take with me while going away or going to parents' house

## Planning for Delivery

All the responding women were asked where they are planning to deliver their baby. As shown in **Figure 13**, more than half of the women were planning to deliver at a health facility (51% in the first phase, 63% in second phase). This again is higher than the national average in the 2006 NDHS where only 18% delivered in a health facility.

**Figure 13. Percent Distribution of CPW by Place where They Plan to Deliver Their Baby**



n= 97 in the first phase and 75 in the second phase

Among those women who had planned to deliver a baby at home (n=48), nearly half (48%) of the women reported that they would receive assistance from TBA or FCHV followed by 31% from a neighbor, friends or relatives. Another 20% of the women intended to receive assistance from maternal and child health worker (MCHW), auxiliary health worker (AHW) or community medical assistant (CMA). When further asked about the reasons for not planning to deliver their baby at health facility the most frequently cited reasons were not perceiving the need for delivering babies at health facilities (65%) followed by embarrassment (25%), cost (19%), not customary (13%) and high cost/far distance (13%).

Similar to the responses given by the CPW, 2-in-5 husbands/MIL also stated that they would plan to have their wives/DIL delivered the babies at home. The most frequently reported reasons were no need to deliver at the facilities, followed by high cost and lack of transportation.

The perception was health facility is for managing the complications, so they have not planning to have their wives/DIL delivered the babies at health facilities. The findings indicate that the importance of institutional delivery is not yet clear to the pregnant women as well as their husbands and MIL.

## Chapter 3 Findings on FCHVs and Health Workers

The information needed for the study was collected from a total of 32 FCHVs and seven health workers working in Titihiriya and Udarapur VDCs of Banke district in the second phase of the study. This chapter presents finding on knowledge of health worker and FCHV about calcium, service delivery, training and supervision.

### 3.1 CHARACTERISTICS OF THE RESPONDENTS

The age of the FCHVs included in the study ranged from 24 years to 62 years with the median age of 37.5 years. 82% of the 32 FCHVs belonged to 30–49 years age group depicting inclusion of older than those of younger volunteers. Over one third of the FCHVs were Brahmin or Chhetri followed by 28% Tharu. More than one in every 10 FCHVs is Muslim and Dalit (**Table 33**). Over three-fifths of the FCHVs were reported to be literate and most of them had either primary or secondary level of schooling only.

**Table 33. Distribution of FCHVs by Age, Ethnicity and Literacy Status**

DESCRIPTION	%	NUMBER
<b>Age of respondents (in completed years)</b>		
Less than 30 years	15.6	5
30–39 years	40.6	13
40–49 years	40.6	13
50 years+	3.1	1
<b>Median (SD)</b>	<b>37.5</b>	<b>8.21</b>
<b>Caste or ethnicity</b>		
Brahmin/Chhetri	34.4	11
Tharu	28.1	9
Muslim	15.6	5
Dalit	12.5	4
Magar, Yadav, Kurmi	9.4	3
<b>Where can read and write</b>		
Yes	62.5	20
No	37.5	12
<b>Total</b>	<b>100.0</b>	<b>20</b>

Of the seven health workers included in the study three were Sr. AHW/AHW; one auxiliary nurse midwife (ANM), two MCHW and one Village Health Worker (VHW). Except two health workers all five were either Brahmin or Chhetri.

### AWARENESS OF CALCIUM

Efforts were made to assess the current status of knowledge of the FCHVs and health workers on calcium supplementation. It was assumed that these volunteers and workers were expected to distribute and support the pregnant women to increase the acceptability and compliance of calcium uses. Therefore, it was imperative that they were well aware about calcium.

## Knowledge

Nearly 9-in-10 FCHVs knew that use of calcium could prevent severe headache and convulsion/fits during pregnancy. A notable proportion of the FCHVs knew that dangers signs such as upper abdominal pain (47%) and blurred vision (34%) could be prevented from the use of calcium. More than 9-in-10 respondents were aware of at least two out of four such danger signs (**Table 34**). More than one-third of the FCHVs also mentioned swelling in hands and legs that can be prevented from the use of calcium. A great majority (94%) of the FCHVs was correctly aware that a pregnant woman should start taking calcium from the second trimester of their pregnancy while all the FCHVs knew that calcium should be taken for at least three conjugative months during pregnancy. Nearly 82% of the FCHVs could correctly state that calcium should be stored in place away from sunshine. The aforesaid information reveals that the FCHVs were adequately aware of the procedures of use of calcium and could effectively assist the pregnant women to familiarize themselves with calcium use resume.

**Table 34. Percent Distribution of FCHVs by Knowledge about the Danger Signs and Symptoms that can be Prevented from the Use of Calcium**

DESCRIPTION	%	NUMBER
<b>Knowledge about danger signs that can be prevented from the use of calcium (Multiple Response)</b>		
Severe headache	87.5	28
Convulsion and fit	87.5	28
Upper abdominal pain	46.9	15
Blurred vision	34.4	11
<b><i>Known two or more danger signs</i></b>	<b>93.8</b>	<b>30</b>
Swelling in hands and face	37.5	12
Dizziness	18.8	6
Other (prevents postpartum hemorrhage; protect from fever)	15.6	5
<b>Total (n)</b>	<b>-</b>	<b>32</b>
<b>From which month of pregnancy should a woman start to consume calcium? (months of pregnancy)</b>		
5	93.8	30
6	3.1	1
7	3.1	1
<b>Total</b>	<b>100.0</b>	<b>32</b>
<b>For how many months a pregnant woman should take calcium? (month)</b>		
3	100.0	32
<b>Total</b>	<b>100.0</b>	<b>32</b>
<b>Appropriate place to store the calcium tablets/powder (Multiple Response)</b>		
Cold place	43.8	14
Dry place	40.6	13
Place where sunshine is not there	81.3	26
Box	18.8	6
Other (bag; protects from air; away from the reach of children)	12.5	4
<b>Total (n)</b>	<b>-</b>	<b>32</b>

## Service Delivery

All the 32 FCHVs distributed calcium to the pregnant women of their working areas. The health workers of the respective study areas also confirmed that FCHVs of their areas visited them regularly to receive the calcium indicating assurance of availability of calcium with them for distribution. During calcium distribution all the FCHVs had provided essential information to the pregnant women, which included information on importance of using calcium, time of the day for taking calcium, number of tablets/packet to be taken each time, the need for using calcium every day, number of months that calcium should be taken and need for taking water and foods same or more than usual amount during the consumption of calcium. Over 8-in-10 FCHVs also reported providing information on the need for keeping the calcium away from sunshine. However, just over half of the FCHVs reported informing the pregnant women about the possible side effects from the use of calcium (Table 35).

**Table 35. Distribution of FCHVs by Type of Information Related to Calcium Supplements provided to the CPW**

DESCRIPTION	%	NUMBER
<b>Whether distributed the calcium supplement to the pregnant women</b>		
Yes	100.0	32
No	-	-
<b>Total</b>	<b>100.0</b>	<b>32</b>
<b>Type of information usually given to the women at the time of calcium distribution</b>		
Importance of using calcium during pregnancy	100.0	32
Time of the day that they should take tablets/powder	100.0	32
Number of tablets/packets to be taken each time	100.0	32
Need for using calcium every day	100.0	32
Number of months they should take calcium continuously	100.0	32
Need for taking water and foods same or more than usual during the consumption of calcium	100.0	32
Keeping the calcium away from sunshine	84.4	27
Possible side effects from the use of calcium	53.1	17

In order to examine whether or not the calcium distribution scheme interfered with the other micronutrient distribution activities, the FCHVs were asked about their activities regarding iron distribution to the pregnant women. In this respect, FCHVs were asked if they have been distributing the iron tablets besides calcium supplement, all 32 FCHVs responded affirmatively. When further asked if they had faced any difficulties in distributing iron and calcium simultaneously, only two out of 32 FCHVs reported that they found difficulty in convincing the pregnant women on the rationale for taking iron as well as calcium supplement. Regarding their own opinion on simultaneous distribution of iron as well as calcium, a great majority (97%) of the FCHVs viewed that it was good to distribute both iron and calcium for the betterment of the women. However a considerable proportion (19%) of the FCHVs doubted that women might drop taking one type of the supplement, iron or calcium, by virtue of taking another type. Overall, the indication was that the distribution of calcium would not adversely affect distribution of other micronutrients, namely iron supplement. Regarding the simultaneous distribution of iron as well as calcium the FCHVs, expressed as follows:

#### FCHV's Opinion on Simultaneous Distribution of Iron As Well As Calcium

- It is good that both iron and calcium are being distributed for the betterment of women (97%)
- Women may drop taking one type of pills because they are taking the other type (19%)
- Too many tablets to be distributed which is difficult task for me (6%)

### 3.2 EXPERIENCES WITH ACCEPTABILITY AND COMPLIANCE OF CALCIUM SUPPLEMENT

FCHVs were asked if they had noticed any women who did not accept the calcium tablets easily. In response 1-in-10 FCHVs had encountered pregnant women who did not accept the calcium tablets easily indicating more women being complied with consumption of calcium tablet. FCHVs (n=3) who encountered such women estimated that the proportion of women who did not accept the calcium tablets easily would fall from 25% to 50%. According to the FCHVs the reasons for not accepting the calcium tablets easily were the big size and the inconvenience in using the tablets.

FCHVs were also asked if they had noticed any women who did not accept the calcium powder easily, contrary to the tablets the great majority (88%) of the FCHVs reported encountering the pregnant women who did not accept the calcium powder easily indicating more women being reluctant to accept calcium powder. FCHVs (n=4) who encountered such women estimated that the proportion of women who did not accept the calcium powder easily would fall from 25% to 100%. According to the FCHVs the reasons for not accepting the calcium powder easily were bad taste (n=4) and some side effects such as nausea and gas in stomach (n=1). The aforesaid information indicates that compliance is more likely to be maintained by user of the calcium tablets than user of calcium powder. The experience of side effect by the women were confirmed by the response of the health workers also as two of the seven health workers included in the study said that within the last three months some women had visited the health facility complaining of side effect due consumption of calcium. The side effects that the women reported and found were gas in the stomach, constipation and lowering of blood pressure. The health workers also reported that they provided information of side effects. The woman who developed the sign of PE/E in spite of taking calcium was referred to the hospital for further management.

FCHVs were also asked about the proportion of pregnant women who had strictly followed the instruction they have given regarding the use of calcium. In response, majority (84%) of the FCHVs indicated that all the women are strictly following the instruction.

The FCHVs were asked about their exposure to the public opinion regarding calcium distribution to and consumption by the pregnant women. An overwhelming majority (94%) of FCHVs found the people saying that calcium was good for the women followed would help improve child's health (16%). FCHVs were also asked about their concern regarding the calcium distribution program. The FCHVs' own concerns about the calcium distribution program were ensuring provision for adequate supply of calcium (19%) and continuation of distribution to all pregnant women of their working areas. The other concerns include the need for adequate training (13%), an increase in their workload and the need for making the people aware of the calcium distribution program (See box below).

**FCHVs who have ever come across about the comments made by the people of this area regarding calcium and its distribution and consumption**

- Good for pregnant women (94%)
- Increased child weight; help improve child's health (16%)
- Unnecessary government program (6%)
- Other (every pregnant woman was asking for calcium; size of tablets is a bit bigger; commenting that why all pregnant women are not getting it) (9%)

**What concerns/issues the FCHVs have regarding the calcium distribution program**

- Provision of adequate supply of calcium for all pregnant women (19%)
- Provision of elaborated training on calcium (13%)
- Has increased workload (3%)
- Other (provision of salary for FCHV; whether we should distribute it again or not; size of tablets is a bit bigger; need more publicity in the program; should give orientation to the community also about calcium; helps make child healthy; government has done a good job distributing it) (21%)

### 3.3 TRAINING AND SUPERVISION

Adequate training, education and supervision are essential components for the effective calcium distribution scheme. The study tried to assess the status of the requirement in the context of the FCHVs. All FCHVs (n=32) included in the study found to have received training/orientation on distribution of calcium and recording of the distribution. Most (40%) of the FCHVs could not identify the particular person or organization who provided them with training. However, a considerable proportion of them could recall the persons from NFHP II Nepalgunj and Kathmandu and District Health Office, who provided the training between the months of Kartik and Poush 2066.

FCHVs were asked about the adequacy of training to carry out calcium distribution task. Only 3-in-10 FCHVs were of the opinion that the training given to them was enough to carry out calcium distribution tasks. Among those (n=22) who expressed the training inadequate, majority (64%) said that the duration was too short followed by inadequate explanation of various aspects of calcium (18%). Some FCHVs were also suggested refresher training as well (18%) (**Table 36**)

**Table 36. Distribution of FCHVs by Their Opinion Regarding the Adequacy of the Training/Orientation Given on Calcium Distribution Task**

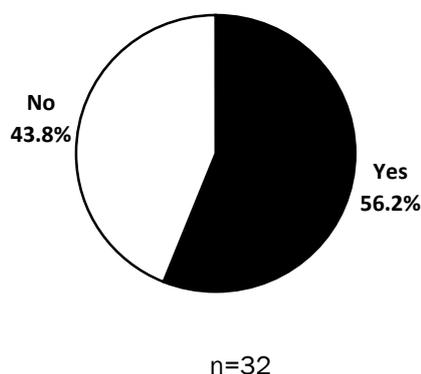
DESCRIPTION	%	NUMBER
<b>Whether training/orientation was enough to carry out calcium distribution task</b>		
Yes	31.3	10
No	68.8	22
<b>Total</b>	<b>100.0</b>	<b>32</b>
<b>Reasons for training not being adequate</b>		
The duration was too short	63.6	14
Things about calcium were not explained adequately	18.2	4
Other*	18.2	4
<b>Total</b>	<b>100.0</b>	<b>22</b>

\*Other includes: cannot remember all things told during the training; refresher training is needed; additional training is needed.

FCHVs were asked if they had been supervised during the distribution of calcium. In response, more than half (56%) of the FCHVs reported that they were supervised by the concerned authorities (**Figure 14**), including doctor or sister (NFHP II staff) from Kathmandu (60.7%) and staff from District Health Office, Nepalgunj (22%). However, 17% of FCHVs mentioned that they had been supervised by SHP staff. Those (n=18) FCHVs who

reported had received the supervision said that it was useful to them. The low supervision by the health workers was further confirmed that of the seven workers included in the study two had not supervised the FCHVs yet with regard to calcium supplement.

**Figure 14. Percent Distribution of FCHVs who were Supervised during the Distribution of Calcium**



### **3.4 CALCIUM DISTRIBUTION AND REPORTING**

Opinions of FCHVs and health workers regarding the distribution mechanism of the calcium supplements were sought during the study. To the question, *do you think it is appropriate to provide all doses of calcium to pregnant women during your first contact with her?* Over 90% of the FCHVs felt that it was not appropriate to distribute all the doses of calcium to the pregnant women during their first contact with them. Only 9% of the FCHVs were in favor of this mechanism. Likewise, all health workers had also expressed that it was not appropriate to distribute all doses of calcium to the pregnant women during the first contact.

All FCHVs (n=32) were also asked if they had maintained the records of distribution of calcium to the pregnant women. Those who responded affirmatively were further requested to show the records at the time of interview. It was found that all FCHVs had maintained the records of distribution of calcium to the women. FCHVs were also asked if they had faced any difficulties in recording the information on the record form. Only 1-in-10 FCHVs reported facing difficulties in recording the information on the recording form because of lack of clarity in the correct procedure of recording and difficulty in reading the form.

The health workers felt that inclusion of calcium distribution activities to the health facility had some positive effects: increase in ANC visits; more knowledge on eclampsia/pre-eclampsia and calcium among health facility staff; and increase in profile of the health facility. Some of the workers expressed that since inclusion of calcium in the health facility was recent activities it would be too early to estimate the positive effect on the activities. However, majority of the health workers had opinion that the inclusions of calcium distribution have not had any negative effect on activities of the health facility.

### **3.5 SUGGESTIONS TO IMPROVE CALCIUM SUPPLEMENT PROGRAM**

Suggestions of FCHVs and health workers with respect to mode of calcium distribution, recording, education to women, etc. were sought during the study. The results are discussed in this section.

#### **Calcium Distribution**

Most of the health workers suggested distributing calcium through FCHVs and some also said that the distribution could be done both by the health workers themselves as well as the FCHVs. The reason for suggesting FCHVs as the appropriate distributor of

calcium was that they would live in the same community and easier to distribute to pregnant women. Similarly, the reason for suggesting health worker for calcium distribution was that they had more training and knowledge on calcium.

The health workers were also asked if they had noticed any strengths and weakness regarding calcium distribution by the FCHVs. They emphasized FCHVs as the appropriate distributors of calcium on the phase because they were: already distributing the other micronutrient supplement and therefore distribution of calcium would not be a difficult task for them; and they were familiar and trusted by women. Some health workers, however, argued that distribution of the calcium through the FCHVs might not be appropriate because most of them were illiterate and might face problems in communicating the women on procedure of consuming the calcium and in recording properly the information about distribution on record form.

Health workers were asked if any FCHVs visited them to get advice and support in respect to calcium distribution. In response, five of the seven health workers said that the FCHVs visited them to get advice on distribution of calcium. The reasons for visiting were as follows:

- To clarify when a woman should start taking calcium
- When to distribute tablets form to those who would like to switch from the powder form
- Ways of counseling to those women who complain of side effects
- To clarify confusion regarding the number of tablets to be consumed in a day
- To consult on the filled up recording forms

## **Recording**

Suggestions of FCHVs with respect to making the recording task much easy were sought during interview. Over half of the FCHVs were of the opinion that there was no need to make any changes in the present calcium distribution recording form. A considerable proportion (20%) of the FCHVs suggested that the form should be made simpler and another 12% suggested for making the adequate space to check information in the relevant boxes. One in every 10 respondents also felt the need for training on procedure of recording particularly to the illiterate FCHVs.

## **Education to Pregnant Women**

Opinion of FCHVs and health workers regarding the best ways of giving education on calcium to the pregnant women was also sought during interview. Most of the FCHVs and health workers suggested the following ways to provide education to pregnant women:

- Through mothers group meetings
- Person to person contact by FCHVs or health workers
- Organizing separate meetings for pregnant women
- Though family members

Both the FCHVs and health workers were also asked about the appropriate materials to give education on calcium to the people in their community. Majority of the FCHVs suggested that the most appropriate materials and media during education on calcium would be posters (84%) followed by flipcharts (63%) and pamphlets (44%). Some FCHVs also suggested booklets (19%) and performing street drama (13%) to impart knowledge about calcium to the community people. The health workers also suggested using various media including street drama performance and FM radio for public awareness program on calcium.

## **Other Suggestions**

The FCHVs were asked to provide suggestions to make the calcium distribution program more effective. The most frequently cited suggestions were:

- Publicity about calcium supplement through mass media (34%)
- Provision of training to FCHVs on calcium (25%)
- Ensuring enough calcium to all eligible women (13%)
- Orientation to all pregnant women on importance of calcium (12%)

In order to make the tasks of calcium distribution, recording and education more effective, a great majority (88%) of the FCHVs suggested that supplies such as calcium and recording register should be made available in time; bags and dress with logos be made available (72%) and refresher training be given (6%). In addition, a considerable proportion of them mentioned that educational materials (25%) and separate forms for recording calcium distribution (28%) should be provided.

# Chapter 4 Conclusions and Recommendations

## 4.1 SUMMARY AND CONCLUSIONS

### Introduction

Realizing the importance of calcium to prevent pre-eclampsia, this study was conducted from January–June 2010 in two VDCs in Banke district among pregnant women (97), their husbands (24), MILs (25), FCHVs (32) and health workers (7). Information provided in this section include acceptability of calcium, ease of use, preference of two different forms (tablets and powder) and compliance.

These study findings will help inform further piloting of community-based calcium supplementation for pregnant women in Nepal.

### Findings on CPWs and Their Families

#### a. Characteristics of the respondents

The age of the CPW included ranged from 17–42 years with median age of 23 years. Ethnic groups included: Tharu (27%), Muslim (25%), Brahmin/Chhetri (13%) and Dalit (13%). Majority (67%) of the husbands of the CPW were below 30 years of age and most (84%) of the MIL were between 40–59 years old. Most of the CPW had received calcium supplements either in the fifth or sixth months of their pregnancy.

#### b. Knowledge about calcium supplementation

The majority of the respondents (CPWs, MILs and husbands) reported that calcium supplements can prevent the most danger signs related to PE/E which helps to reduce the risk of mothers' and babies' deaths, indicating the presence of good knowledge among the CPW and their family members about the importance of using calcium during pregnancy. Nearly three-quarters (72%) of the CPW were aware that use of calcium supplements during pregnancy can prevent headache and convulsion or fits. Less than 50% reported awareness on prevention of abdominal and prevention of blurred vision (28%). Over 75% of the CPW knew at least two out of four danger signs and symptoms shown in the BCC materials.

More than three quarters of the CPW had correct knowledge about dosage, frequency, duration and time of calcium intake. Over 9-in-10 women also correctly knew that calcium powder should be taken mixing with food. Only half of the MIL and husband reported correctly on dosage, frequency and calcium intake, although the reports of correct dose of powder was higher than tablets for this group.

#### c. Calcium initiation and preference

Most pregnant women found to have started taking calcium from the beginning of their 3<sup>rd</sup> trimester, i.e. one month late than the recommended fifth month.

In the end of the second month when the 75 eligible CPW were given opportunity for choosing the form of calcium they preferred, the majority chose calcium tablets.

#### d. Duration of use of calcium tablets and powder

Nearly 3-in-4 CPW in the first phase reported that they consumed each of the calcium tablets and powder for 30 prescribed days. The percentage of women who consumed calcium tablets for 30 days has increased from 70% in the first phase to 82% in the second phase while no marked improvement was noticed in the compliance of calcium powder across the two phase of piloting (72% in the first phase and 69% in the second phase).

27.8% of the CPW in the first phase reported that they missed taking calcium tablets any day and the corresponding figure for the calcium powder during the first phase was reported to be 22.6%. In the second phase, the proportion of women who missed taking the tablets reduced by 9% and the proportion of women who missed taking the powder increased by 8%. The above information indicates that women who had consumed the calcium according to their own choices are less likely to miss in taking it than those who do not receive according to their choices. Most of the women in the first phase reported that they did nothing with the missed or unused tablets (67%) and powder (51%) while in the second phase most of the women reported taking the missed tablets (86%) and powder (67%) in later days. The information reveals that when the women are given opportunity to select the form of calcium they desired there is more likely to be used the missed calcium.

e. **Consumption of calcium tablets and powder**

Majority of CPW (more than 90%) in both phases reported that they consumed the required doses of calcium supplements (2 calcium tablets or 1 packets of calcium powder). Majority of women in both phase of survey reported that they took calcium tablets or powder during the prescribed time of a day, i.e. in the morning after/with breakfast or morning meal.

The compliance in consumption of calcium tablets was much higher in both phases of surveys than that of powder. Over 63% of the CPW in the first phase and 80% in the second phase reported taking all 60 tablets while the corresponding figures for the powder was 47% in the first phase and 69% in the second phase, which indicates compliance in taking required number of calcium tablets or powder increases when the women were provided with the opportunity for taking the calcium of their own choice. Similarly over half (52%) of the women had consumed the calcium tablets or powder for 90 days and a quarter (24%) had consumed for 80–89 days. In terms of doses, only one-third (32%) had consumed the complete doses (90 doses).

Most of the CPW complied with the prescribed doses and time of calcium intake. Only few CPW reported some difficulties in consuming calcium tablet and powder for prescribed doses and time. Difficulties reported for calcium tablet were: difficulty in swallowing two tablets at once and fear of side effects. Similarly difficulties for calcium powder were: inconvenience to consume in the morning with the breakfast/morning meal and spoiling the taste of food after mixing.

f. **Side effects from the use of calcium**

Only a negligible proportion (5%) of the women in the first phase experienced some side effects due to the use of calcium tablets while none of the women in the second phase reported experiencing such side effects. The percentage of women who experienced side-effects from the use of calcium powder was much higher in the first phase than in the second phase of the survey (21% vs. 8%). The reported side effects from the use of tablets include belching, less appetite and lack of movement of fetus. While most frequently cited side effects from the use of powder were nausea followed by belching and heaviness in the stomach.

g. **Clarity of instructions**

In order to increase the knowledge of and compliance to calcium consumption instructions were included in the packets of calcium tablets and powder and in the respective instruction sheets. Only a small proportion (15%) of the women expressed that the instructions were very clear while a majority (67–70%) said it was just clear.

h. **Opinion on calcium and its distribution**

With respect to the size of the calcium tablets almost half of the CPW viewed that the size was just about right and another half said they were too large.

A great majority of the CPW had expressed that the taste of calcium tablets was acceptable to them while the proportion of the women accepting the taste of calcium powder was found less. Despite the differences in acceptability of taste of two forms of calcium, a slight majority (64% in first and 52% in second phase) of the women expressed that it was not needed to change the taste of calcium.

Over 9-in-10 pregnant women during the first phase survey reported that they would like to take calcium for the next one month also. A great majority of the women would like to continue taking tablet form rather than powder form of calcium.

Nearly all the CPW (98%) in first phase and all in the second phase expressed that they would like to take calcium in the future. Similarly, an overwhelming majority of the CPW also reported that they would like to recommend to other pregnant women in the future. This information thus indicates the women's acceptability of calcium supplement.

i. **Opinion on distribution mechanism**

The FCHVs were primarily used to distribute the calcium supplement for this study and almost all pregnant women still preferred this mode of calcium distribution. Similarly, almost all husbands and MIL also expressed that FCHVs should continue distributing calcium for pregnant women.

j. **Support to the use of reproductive health services**

One of the notable indications for likelihood of soliciting support from family members was that an overwhelming proportion (94%) of the husbands/MIL perceived that consumption of calcium could be beneficial for both wife/DIL and the expected baby. Another indication for likelihood for soliciting such support was that nearly 84% of the husbands/MIL expressed that their wives/DIL should continue taking calcium.

In addition, half the husbands/MIL reported had helped their corresponding wives/DIL by advising to complete the dose; appreciating the calcium use behaviors and reminding wives/DIL to take calcium. A higher proportion (79%) husbands than MIL (44%) found willing to get calcium by themselves for their wives/DIL. The aforesaid information indicates that the pregnant women would get adequate support from their husbands/MIL for consumption of calcium.

k. **Antenatal services**

Except one woman, all women reported visiting health facility for antenatal care during their recent pregnancy. Over three quarters of them had received advice from the health worker to take calcium supplement during their ANC visit.

Almost all (97%) the women in the first phase and all women in the second phase were taking iron supplement during their current pregnancy. Nearly 79% of the women said that they had not missed taking iron during the consumption of calcium. Those who missed taking iron did so because of forgetfulness and non-availability of iron but not due to the complication of consuming calcium at one time of the day and iron at another. The aforesaid information indicates that consumption of calcium did not interfere the iron taking behavior of the women.

## **Findings on FCHVs and Health Workers**

a. **Awareness of calcium supplement**

Nearly 9-in-10 FCHVs reported that use of calcium could prevent severe headache and convulsion/fits during pregnancy. A great majority of the FCHVs were correctly aware that a pregnant woman should start taking calcium from the second trimester of their pregnancy while all the FCHVs knew that calcium should be taken for at least three conjugative months during pregnancy. The aforesaid information reveals that the FCHVs were adequately aware of the

procedures of use of calcium and could effectively assist the pregnant women to familiarize themselves with calcium use resume.

All the 32 FCHVs had experiences of distributing calcium to the pregnant women of their working areas. During calcium distribution all the FCHVs had provided essential information to the pregnant women on use of calcium. All FCHVs were distributing the iron tablets also besides calcium supplement. A great majority of the FCHVs did not face any difficulties in distributing iron and calcium simultaneously. Almost all (97%) FCHVs viewed that it was good to distribute both iron and calcium for the betterment of the women. Overall, the indication was that the distribution of calcium would not adversely affect distribution of other micronutrients, namely iron supplement.

**b. Experiences of FCHVs with calcium and its services**

A great majority (88%) of the FCHVs reported that pregnant women had not easily accepted calcium powder in comparison to tablet. According to them, some of the reasons were: bad taste and some side effects such as nausea and gas in stomach. The aforesaid information indicates that compliance is more likely to be maintained by user of the calcium tablets than user of calcium powder.

While asking about their concern regarding the calcium distribution program, FCHVs expressed that by ensuring provision for adequate supply of calcium and continuation of distribution to all pregnant women helps to increase program effectiveness. The other concern included the need for more intensive training, worries about the increase in their workload, and the need for making the people aware of the calcium distribution program.

All FCHVs (n=32) included in the study were found to have received training/orientation on distribution of calcium and recording of the distribution. About 3-in-10 FCHVs expressed that the training given to them was enough to carry out calcium distribution tasks.

The importance of supervision of FCHVs in their calcium distribution is equally imperative. More than half (56%) of the FCHVs reported that they were supervised by the concerned authorities and it was useful to them.

**c. Opinion on service delivery and utilization**

Opinion of FCHVs and health workers regarding the distribution procedures of the calcium supplements were sought during the study. A great majority of the FCHVs and all health workers expressed that it was not appropriate to distribute all the doses of calcium to the pregnant women during their first contact with them.

All FCHVs (n=32) were also asked if they had maintained the records of distribution of calcium to the pregnant women. It was found that all FCHVs had maintained the records of distribution of calcium to the women but some of them reported facing difficulties in recording the information on the recording form because of lack of clarity in the correct procedure of recording and difficulty in reading the form.

## **4.2 RECOMMENDATIONS FOR FUTURE CALCIUM SUPPLEMENTATION ACTIVITIES**

**a. Calcium distribution coverage**

A database of all the pregnant women needs to be maintained and updated including the beginning of their pregnancy in order to ensure that all pregnant women would have received calcium supplement in time i.e., right from the beginning of the fifth month of their pregnancies.

b. **Acceptance of calcium**

Most of the pregnant women preferred tablets over the powder, so this form should be used in future calcium activities to increase the acceptability, compliance and coverage. If powder were to be used, options should be explored on altering the taste. Most CPW expressed their willingness to take calcium in the future pregnancies and also recommend for other pregnant women. Based on this, calcium intervention should continue in these areas and expand in other areas also.

c. **Compliance**

Many women started calcium later than recommended period and did not complete the full 90 days of calcium supplementation. A strong BCC component should be designed to counsel CPW to start calcium supplement in time and complete the full course for its effectiveness. By providing symbolic materials, such as wall hanging on a visible place which would alert or remind the women to consume calcium without missing even for a single day.

d. **Distribution and channel**

Almost all CPW, husbands and MIL preferred and accepted the current mode of distribution of calcium to the pregnant women through FCHVs. For future interventions, this mode should be scaled up. Also calcium should be distributed each month, not all at the single point of time for PW and FCHV interaction. The current iron distribution and consumption is not affected by calcium distribution, as it provided in different period of time. It should be scaled up accordingly.

e. **Awareness messages**

Although BCC messages were designed and distributed to CPW and their families, FCHVs and HW; some messages were found missing. For future intervention, strong messages should develop on initiating calcium intake at the beginning of 5th month, completing full 90 days course and if they missed taking any calcium supplements, what to do with leftover calcium supplements.

f. **Orientation and supervision**

The success of calcium supplement intervention depends on service delivery and counseling from the FCHVs and the health workers. It is recommended that:

- The FCHVs be provided with adequate orientation on calcium distribution and consumption, particularly focusing on counseling technique to the illiterate FCHVs to deal with the pregnant women who were reluctant to consume calcium as instructed.
- The calcium distribution recording form should be made simpler and similar to other supplement recording forms.
- Supervision of the FCHVs in their calcium distribution tasks found to be weak and need to be enhanced. At the same time the health workers of the health facilities should also be well oriented to supervision and consultation procedures as several FCHVs found to have visited them seeking advice for the problems they faced regarding calcium distribution.



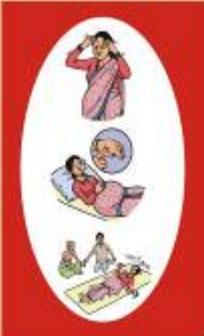
# Appendix A. BCC Materials Used During the Study

### Information Sheet

#### Use of Calcium during pregnancy

**Why to take calcium?**

During pregnancy calcium helps keep women healthy—reducing the chance of developing danger signs that threaten her life and that of her baby. A pregnant woman can sometimes experience severe headaches, blurred vision, edema (swelling) of hands and feet, stiffness of body, convulsions and loss of consciousness—which are the danger signs. We called this condition as pre-eclampsia/eclampsia. We can reduce the risk of developing these danger signs with the regular use of calcium.



Note: If any pregnant woman taking calcium develops any danger signs, visit health facility immediately.



**When and how much to take calcium?**

- As soon as you start the fifth month of pregnancy, take calcium once a day for 5 months.
- It is safe and effective.
- It can be found in tablet and powder form.
- Both forms are equally effective.
- It helps the health of mother and baby.
- Drink water more than usual throughout the day when taking calcium.

**Where can you receive calcium?**

- Female Community Health Volunteers.

**How to keep calcium safely?**

- Calcium should be stored safely in cool, dry place and prevent exposing to direct sunlight.



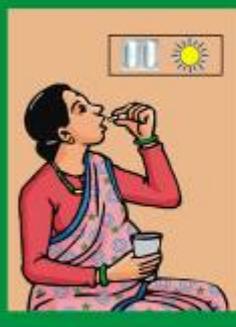
### BCC Materials for Calcium Tablets





**When and how much to take calcium?**

- As soon as you start the fifth month of pregnancy, take calcium once a day for 5 months.
- It is safe and effective.
- It can be found in tablet and powder form.
- Both forms are equally effective.
- It helps the health of mother and baby.
- Drink water more than usual throughout the day when taking calcium.

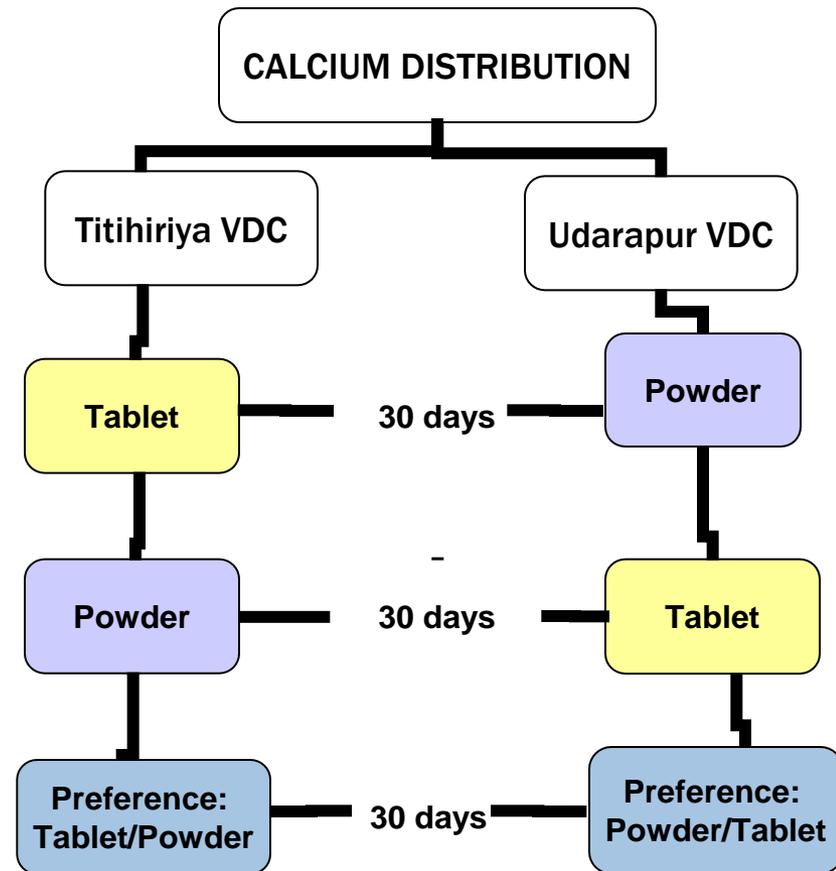







# Calcium Acceptability and Compliance Study: Study Design

- Titihiriya and Udarapur VDCs of Banke District
- Household-level antenatal contact for health education, assessment and dispensing of calcium by FCHVs
- 1g/day for 90 days
- 97 PW participated
- Supplemented with two different forms of calcium:
  - Powder (1 packet/day)
  - Tablet (2 tablets/day)



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Maternal and Child Health  
Integrated Program



# Calcium Acceptability and Compliance Study: Study Design

- Data collection methods:
  - In-depth interview with PW, husbands, mother in-laws, FCHV and HW
  - FGD with PW
- First round of study=who completed 60 days intake of calcium both forms (97 PW)
- Second round of study= Who completed 30 days intake of their preferred form (75 PW)



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# Lessons Learned

1. Slogan/branding
2. Knowledge/attitude
3. Calcium consumption
4. Side effects
5. Calcium compliance
6. Storage
7. Family/peer support



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# 1. Logo/slogan/branding

- No logo or “branding” of calcium was done
- Slogan
  - *Taking calcium during pregnancy helps the mother and baby be healthy*



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## 2. Knowledge/Attitude about Calcium

- Most of the PW knew that it prevents severe headache, convulsion and fit.
- PW women had higher knowledge than their husbands and MIL.
- Majority of PW, husbands and MIL perceived calcium help reduce the risk of mothers' and babies' deaths.
- 99% would recommend calcium to other PW
- 98% would take in future pregnancies



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# 3. Calcium Consumption

- Majority found calcium tablet easy to take
- 50% found the tablets too large



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## 4. Side Effects

- 90% reported no side effects
- Reported side effects: belching, less appetite and lack of movement of fetus



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# 5. Compliance of Calcium Consumption

- About half of PW started taking calcium on the same day prescribed
- >95% PW had taken calcium daily
- Why missed taking:
  - Forgot to take
  - Tablet size too large
    - From field visit, some found the tablets too large to swallow and were breaking them in half to take
  - Took only 1
    - 68% compliance on # of days but not correct dose



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# 5. Compliance

- Asked about number of days and number of doses (confusing to define compliance)
- Discontinuation
  - Delivery
  - Illness and FCHV told them to stop taking calcium
- Need to include the message on what to do with missed doses



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# 6. Storage

- Storage problem was found due to lack of suitable place and children will throw them away



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# 7. Peer/Family Support

- MIL and husbands informed and supportive



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# Other Issues: FCHVs

- Training
  - Felt training too short, inadequate information on calcium, needed refresher training
- Recording
  - Sticker too small
  - Make separate recording forms for calcium (28%)
- Other
  - Bags and dress with logos given (72%)
  - More educational materials (25%)



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