

CHAPTER - III

MATERIALS AND METHODS

The general and specific objectives of the study are stated below.

GENERAL OBJECTIVES

I. To conduct an in-depth study of selected management components pertaining to National Nutritional Anemia Prophylaxis programme (now known as Anemia Control programme) and National programme for the Prevention of Blindness due to Vitamin A Deficiency (henceforth referred to as NAP and VAP respectively), using both qualitative and quantitative research methods.

II. To assess the role of Family Planning Programme (FP) in influencing the implementation of NAP and VAP.

III. To assess the impact of NAP and VAP on beneficiaries.

IV. To assess the relative strengths and limitations of the qualitative and quantitative research methods used in achieving the study objectives.

V. To make recommendations for improving the management of NAP and VAP.

SPECIFIC OBJECTIVES

I. To study the management of NAP and VAP in terms of

A. Manpower and material resources

1. Educational qualifications of the functionaries.
2. Knowledge, attitudes and practices of functionaries in relation to NAP and VAP.
3. Pre-service and in-service training provided to functionaries.
4. Work organization and time allocation to various job functions.
5. Infrastructural support provided to functionaries
 - a) Transport
 - b) Housing
 - c) Incentives
 - d) Disincentives
 - e) Logistics.

B. Monitoring and Control

1. Targets set for NAP and VAP.
2. Supervision provided to functionaries.
3. Management Information System

- a) Circulars received and transmitted at district level.
 - b) Records related to NAP and VAP maintained at the centre level.
 - c) Reports related to NAP and VAP at district and centre level.
 - d) Daily diaries.
 - e) Meetings conducted at district and centre level.
- II. To compare FPP with NAP and VAP with respect to
- 1. Relative time allocation.
 - 2. Relative level of difficulties faced.
 - 3. Relative importance accorded by functionaries.
- III. To assess the impact of NAP and VAP on beneficiaries in terms of
- 1. Responses of beneficiaries regarding utilization of iron and vitamin A supplements.
 - 2. Hemoglobin levels and prevalence of anemia in pregnant and lactating women and preschool children.
 - 3. Prevalence of Bitot's spots in preschool children.
- IV. To assess the relative strengths and limitations of the qualitative and quantitative research methods used with regard to achieving the study objectives.

SITE OF STUDY

The site of the study was Indore district in the state of Madhya Pradesh (MP) in India (Figure 4). Both urban and rural areas of Indore were covered in the study. The urban-rural population ratio in Indore is 66:34.

THE EXPLORATORY PHASE

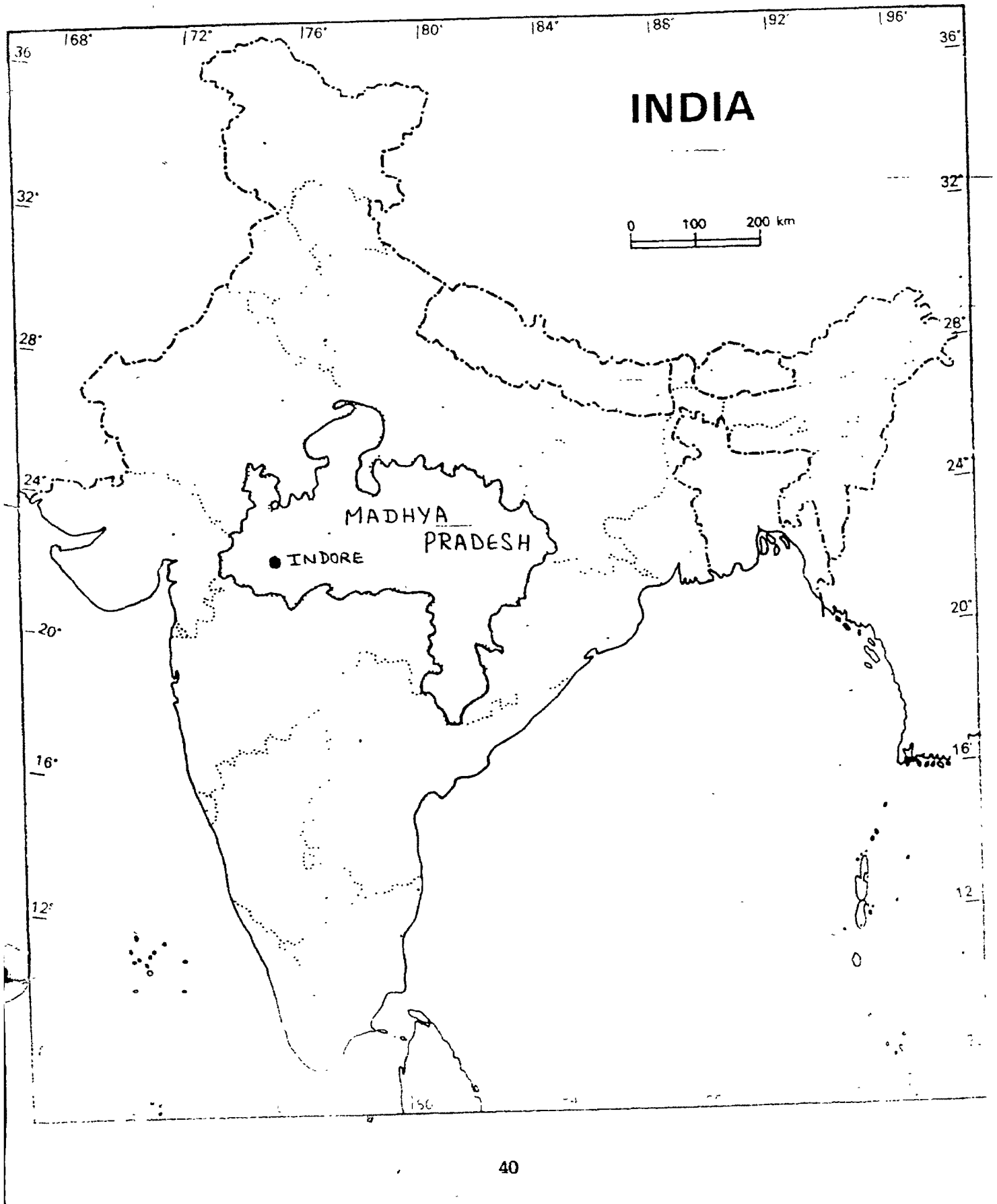
Permission was obtained from the Joint Director, Health services, Indore division and the Dean, Mahatma Gandhi Memorial Medical College, Indore to conduct the study in urban and rural health centres of Indore.

The study went through an exploratory phase in order to gain familiarity with the study area, to pretest and time the execution of the tools of data collection (for example, interview schedules and observations) and consequent to that, decide on the final sample size considering study requirements and feasibility aspects. The exploratory phase is elaborated below.

The exploratory phase consisted of the following steps:

- 1. Informal conversations were held with District Education, Information and Media Officer (DEIMO), Deputy DEIMO and District Public Health Nurse (DPHN) regarding the study area.
- 2. On the basis of the informal conversations, one Community Health Centre and one Subcentre in rural

FIG 4 . INDORE DISTRICT IN THE STATE OF MADHYA PRADE
(INDIA)



Indore, and one Urban Family Welfare Centre in urban Indore were selected for the pilot study to get an initial exposure to the study area and to pretest the qualitative and quantitative methodological tools.

3. In the meantime, the structured interview schedules and observation guidelines for data collection were prepared. The interview schedules were intended for eliciting information about the knowledge, attitudes and practices of the functionaries in relation to NAP and VAP. The observation guidelines aimed at eliciting first hand, information related to the skills of the functionaries in implementing NAP and VAP and viewing these two nutrient programmes in the overall context of primary health care services in Indore, i.e., the Maternal and Child Health and Family Planning Programmes.

4. Ten days were spent at each of the two centres : Urban Family Welfare Centre, Sanyogitaganj and rural Community Health Centre, Sanwer. Further, 7 days were spent at Subcentre Dharampuri. During the working hours (usually 8 am to 4 pm) the interviews and observations were conducted.

a) The interview schedules were administered to the multipurpose worker (Female), (henceforth referred to as Auxiliary Nurse Midwife or ANM), multipurpose worker, male (MPW), the Lady Health Visitor (LHV), the Block Extension Educator (BEE) and the Medical Officer (MO) incharge of Maternal and Child Health (MCH) services. On the basis of the responses from this pretesting experience, the interview schedules were modified suitably to increase the clarity of questions in the schedules and to eliminate the redundant questions.

b) Observation guidelines were used to conduct observations of the daily work schedule of the ANMs and LHVs and the time taken for specific job functions, in particular NAP and VAP, and their skills in delivering the services under these two nutrient programmes.

5. It was realized that -

a. The interviews were influencing the work pattern of the ANMs and LHVs in favour of NAP and VAP which started getting more priority. It was therefore decided to precede the interviews with observations in the main study.

b. Structured observations, where data are entered at one hour interval, were not possible since the work pattern of the functionaries varied tremendously and tasks were being performed simultaneously. Further, there was no planned distribution of iron and vitamin A supplements. Hence, it was decided to use the technique of unstructured or scripting observations so as not to lose valuable details pertaining to the management of NAP and VAP.

Further, the exploratory phase clearly revealed that the various primary health services, of which NAP and VAP were components, had a seasonal emphasis, i.e., the summer months were mainly utilized for survey work, MCH programmes were the focus during August to November and Family Planning Programmes was intensively carried out during December to March. Thus, it was evident that for obtaining valid data regarding the management functions of NAP and VAP and for assessing the role of Family Planning Programme in influencing NAP and VAP, the observations had to be spread over one year.

6. This exploratory phase also enabled an estimate to be made of -

- a. The relative distance (km) of the various Urban Family Welfare Centres from the headquarters and of the rural Subcentres from the Primary Health Centres.
- b. The time it would take to carry out the observations and the interviews for each functionary.

7. On the basis of the experiences in this exploratory phase and considering the time frame of about 12 to 18 months for data collection, the sample size was decided keeping in mind the study objectives and the feasibility considerations. Other criteria for deciding the sample size are presented in the section on sample selection.

CONCEPTUAL FRAMEWORK OF THE PRESENT STUDY

The Johns Hopkins University (1979) has developed a Functional Analysis Model indicating the relationship between health needs and services. The key terms used in the model are as follows: a. **Need** : Need is a particular state or condition of health in the community which shows lack of adequate protection or optimal well being. For example, a preschool child belonging to low socio-economic group in India and not given vitamin A prophylactic supplement is inadequately protected, while a pregnant women suffering from anemia is obviously at less than optimal wellbeing. The health needs may be identified by the community or they may be recognized only by professional observers.

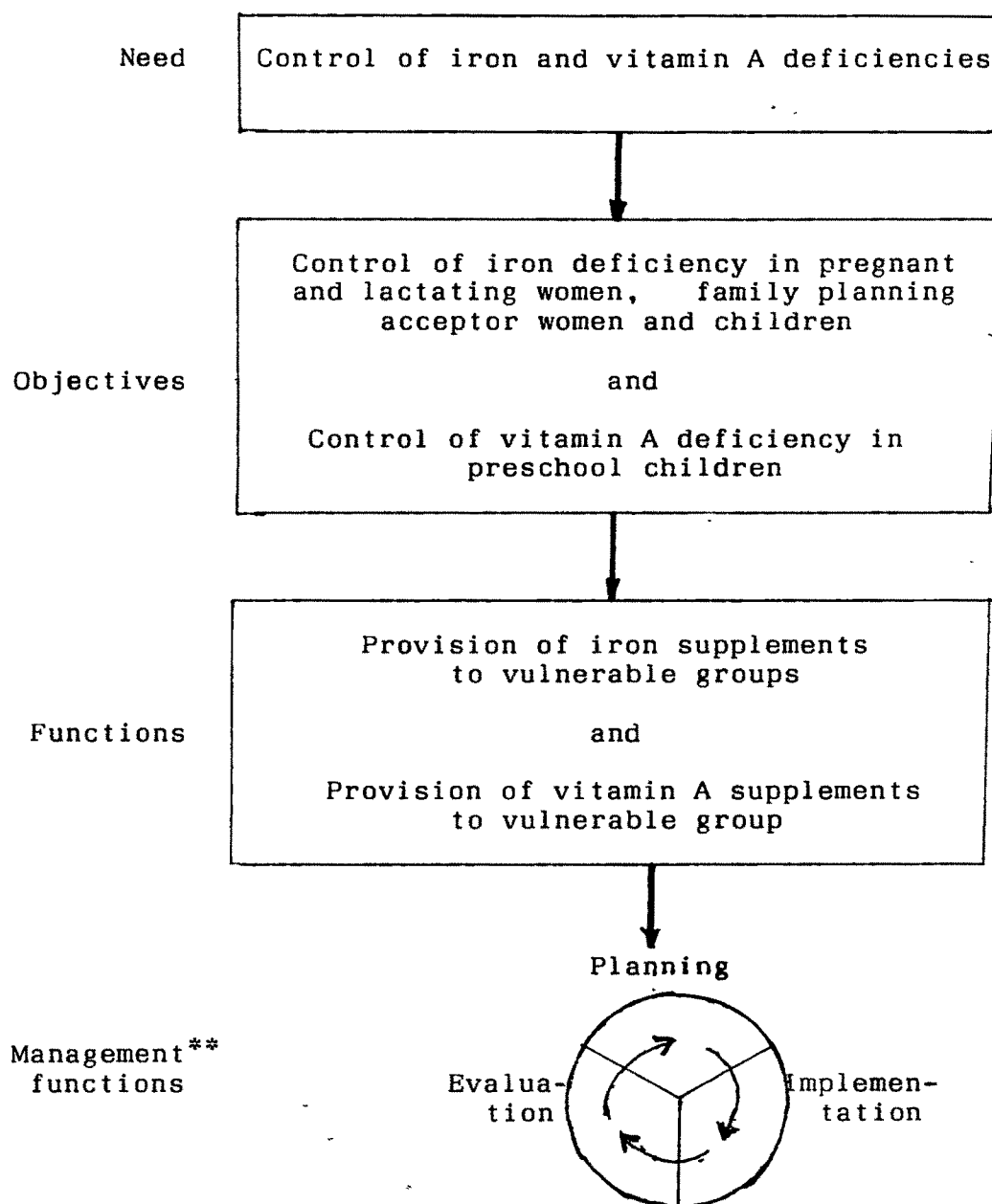
b. **Objective** : It is a defined, measurable result of specific health action to be achieved by a designated time. The nature of health needs leads to general statement of purpose, which is reflected in objective or target.

c. **Function** : It is a homogenous body of activities conducted in pursuit of certain objectives. For example, preventive services.

Figures 5 and 6 illustrate the functional analysis model and conceptual framework as applied to this study.

Recognition of a need for a nutrition programme leads to defining of objectives to fulfil that need. These, in turn,

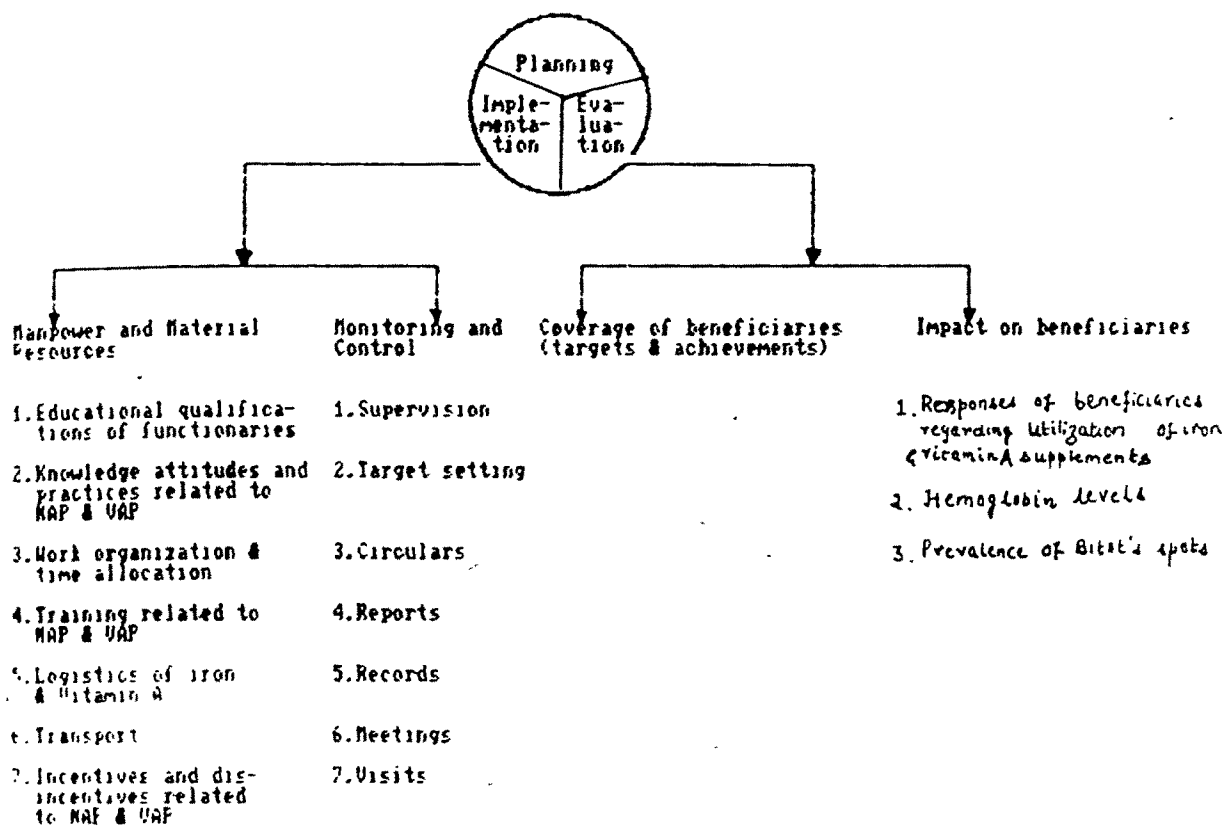
FIGURE 5. ANALYTICAL MODEL OF THE RELATIONSHIP BETWEEN NEEDS AND SERVICES



* Adapted from a Functional Analysis model prepared by The Johns Hopkins University (1979).

** Specific components of management functions studied are elaborated in Figure 6.

Figure 6. CONCEPTUAL FRAMEWORK OF THE STUDY



result in the formulation of functions for a given health and nutrition programme in order to meet the stated objectives. In the present study, these functions were viewed from the perspective of management which encompasses three broad elements: Planning, Implementation and Evaluation. These three functions of management form a continuous cycle in which each is influenced by the other. The planning of iron and vitamin A deficiency control programmes (NAP and VAP) is primarily the responsibility of the Union Ministry of Health and Family Welfare, New Delhi and it was beyond the scope of this study. NAP and VAP are implemented at district and health centre level and the present study focusses upon the implementation and evaluation aspects of these programmes.

Within the implementation function carried out at the providers' level, the manpower and material resources available and the monitoring and control operating with respect to NAP and VAP were studied in detail. The manpower and material resources studied included educational qualifications of functionaries, their knowledge, attitudes and practices related to NAP and VAP, their work organization and time allocation to various job functions, training given to them in relation to NAP and VAP, logistics, transport, and the incentives and disincentives provided to them.

The monitoring and control of NAP and VAP were studied in terms of the targets set, supervision provided to functionaries, reports, records, meetings and community visits related to NAP and VAP.

The study of the evaluation function included coverage of beneficiaries under NAP and VAP, and the impact of NAP and VAP on beneficiaries of the programmes in terms of their knowledge and awareness of NAP and VAP, their hemoglobin levels and prevalence of Bitot's spots.

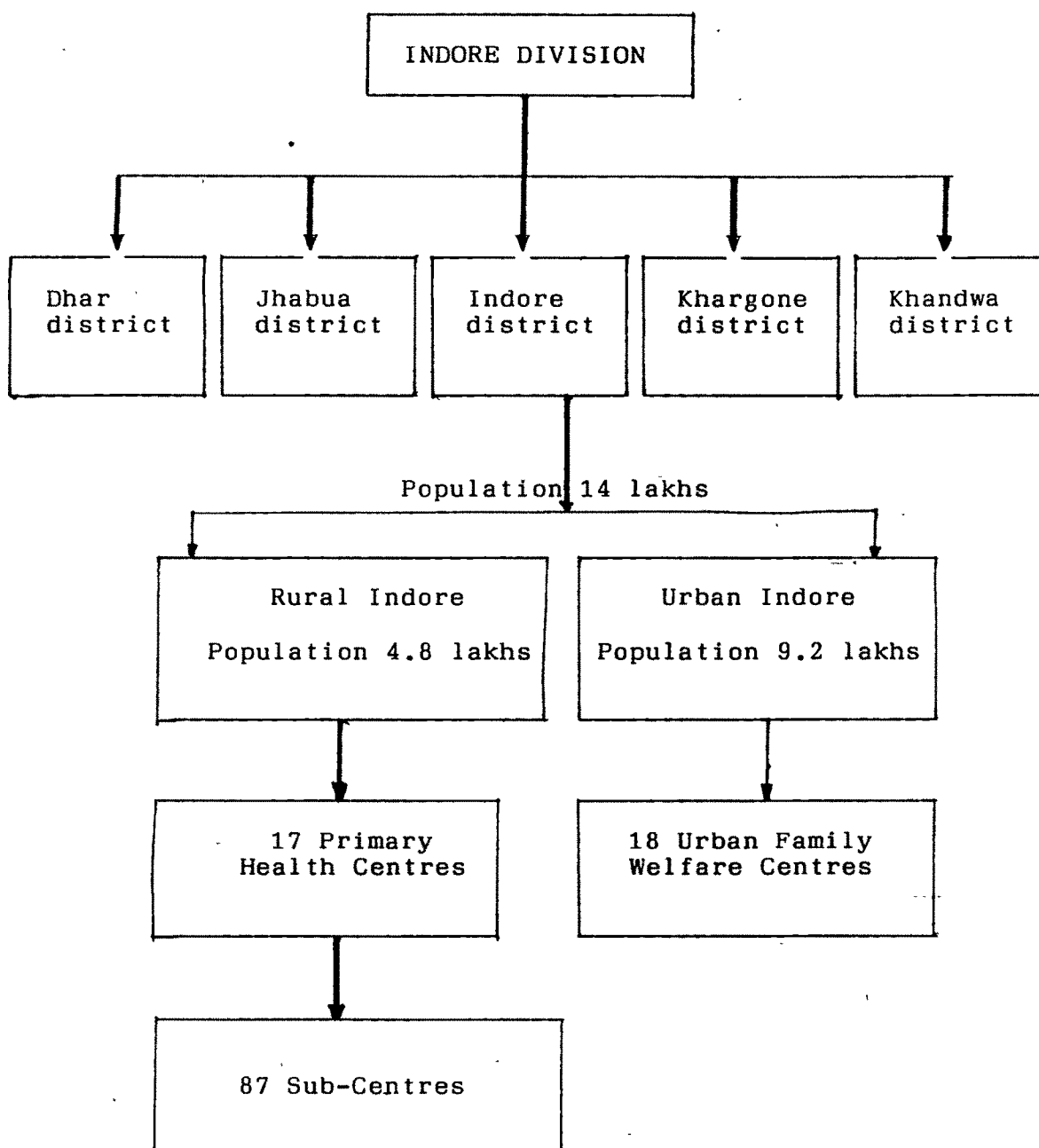
EXPERIMENTAL DESIGN

The present study was a semi-longitudinal study in which observations were carried out over a period of one year (from February 1990 to January 1991). Further, interviews of a cross section of functionaries and beneficiaries were conducted along with the use of other data collection methods and tools.

SAMPLE SELECTION

Before discussing the selection of the sample, it is first necessary to present the total number of study units in the population in urban and rural Indore. Study units in this research work were defined as the Primary Health Centres (PHC) and Subcentres (SC) in rural areas and Urban Family Welfare Centres (UFWC) in the urban areas. Two of the PHCs had been upgraded to Community Health Centres (CHCs). But since this upgradation was very recent, for the sake of simplicity, these Community Health Centres will be referred to as Primary Health Centres in the study. Figure 7 presents the Primary Health Care infrastructure of Indore division of which Indore district is a

FIGURE 7. PRIMARY HEALTH CARE INFRASTRUCTURE IN INDORE



component. There were a total of 17 PHCs in rural Indore for a population of 4.8 lakhs and 18 UFWCs in urban Indore which had a population of 9.2 lakhs. There was a wide variation in the number of SCs under each PHC depending on the geographical area. In all, 87 SCs were in operation at the time of the study. Several of these SCs were located in interior areas, inaccessible by public transport, while some SCs were recently established and had yet to acquire premises and other infrastructural facilities.

Sample Selection

As mentioned earlier, the experience of the exploratory phase aided in the process of sample selection. In addition, since this was an in-depth qualitative study, the following criteria were considered necessary for selecting the sample at each level for achieving the study objectives.

I. Selection of rural and urban health centres

1. Criteria for selecting the PHC and UFWC

- a. The centre should have been in operation for a minimum period of five years.
- b. Posts of all the key functionaries at various levels should be filled up.
- c. The reports of the centres should be available at district level headquarters.
- d. The centres should be geographically representative of the study units.
- e. They should be accessible by public transport.

On the basis of these criteria, rural and urban health centres were purposively selected as under:

PHC	: 5 out of 17 (29%)
UFWC	: 9 out of 18 (50%)

2. Criteria for the selection of Subcentres

- a. The Subcentre should be accessible by public transport.
- b. The posts of ANM and MPW (M) should be filled up.

Thus, one subcentres from each of the PHC was purposively selected for the study on the basis of the above criteria giving a total of 5 SCs.

Figure 8(a), 8(b), 8(c) illustrates the rural and urban centres comprising the sample of the study.

II. Selection of functionaries

Figure 9(a) illustrates the sample of functionaries included in the study. At the district level, all the key officials having a role in the management of NAP and VAP were included in the study. The functionaries included in the study at each centre (urban or rural) represented the various levels in the hierarchy of the health services. The sample size at various levels was as follows :

Figure 8 (a) THE URBAN AND RURAL HEALTH CENTRES COMPRISING THE SAMPLE OF THE STUDY

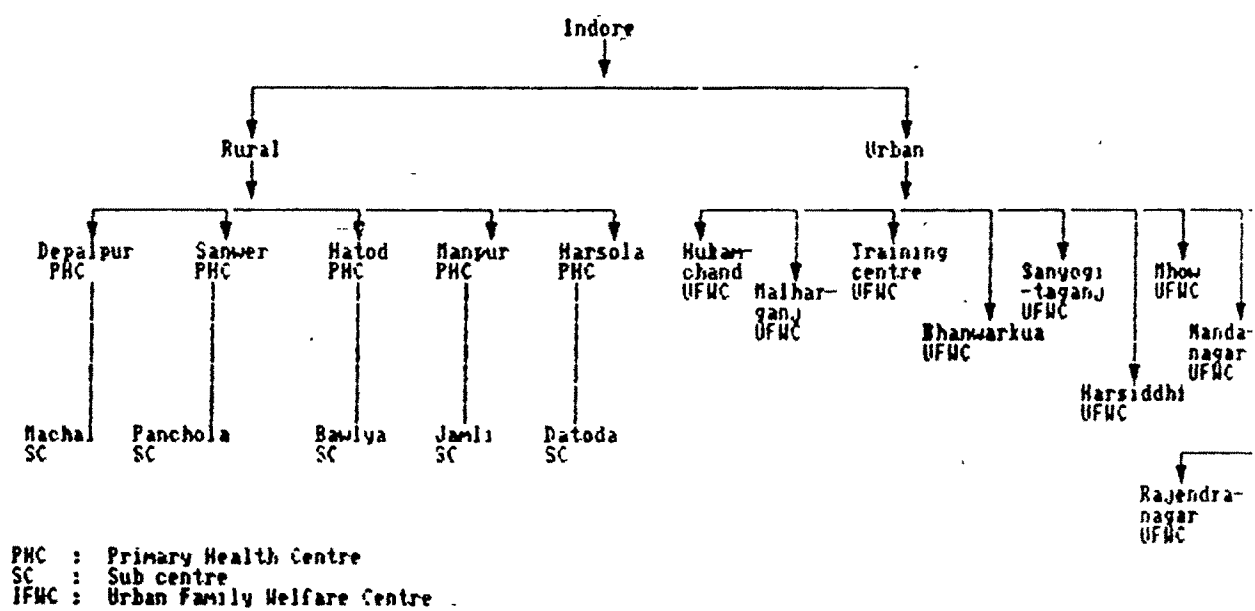


FIG.8(b). RURAL PHCs AND SCs FORMING THE SAMPLE OF THE STUDY
(RURAL INDORE)

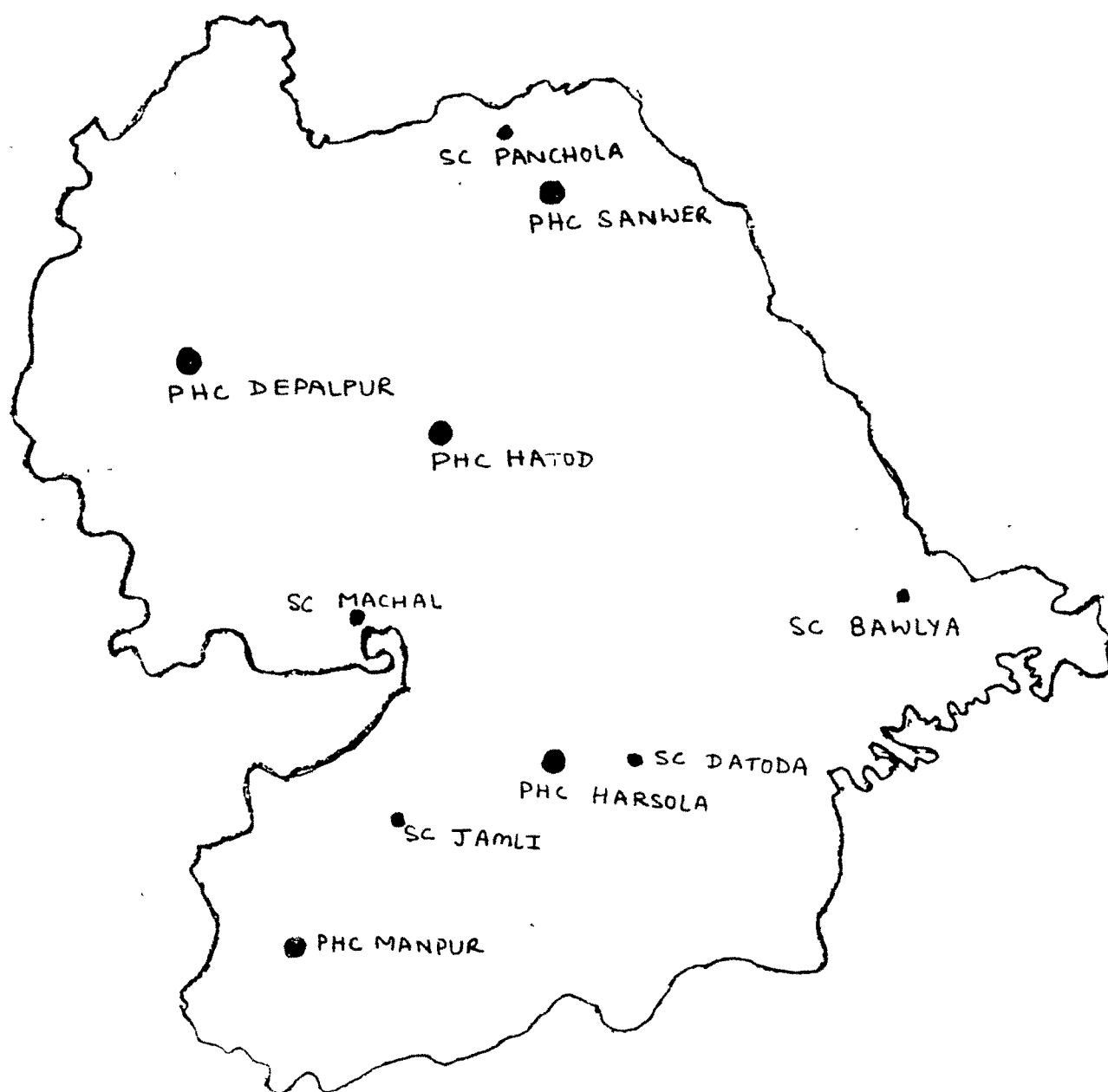


FIG.8(9).UFWCA FORMING THE SAMPLE OF THE
STUDY (URBAN INDORE)

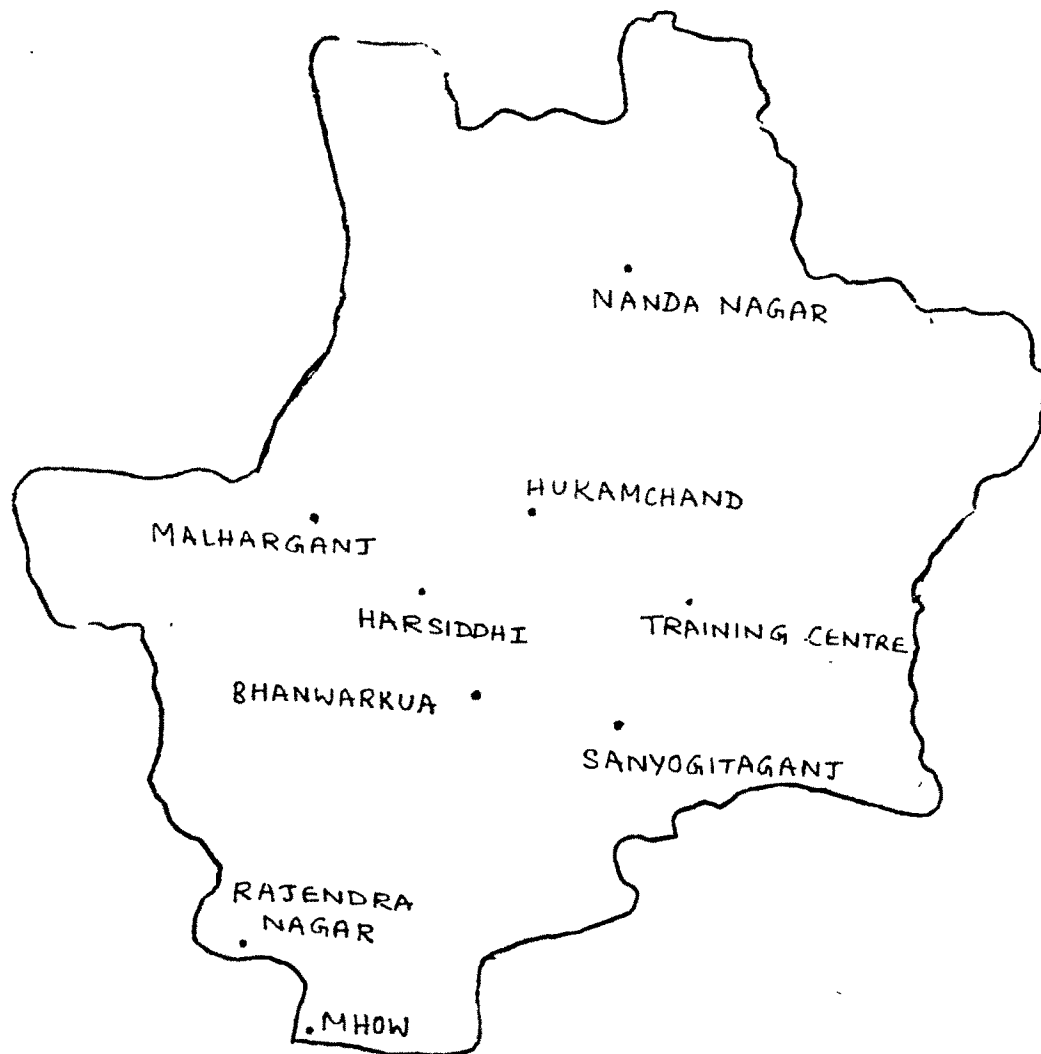
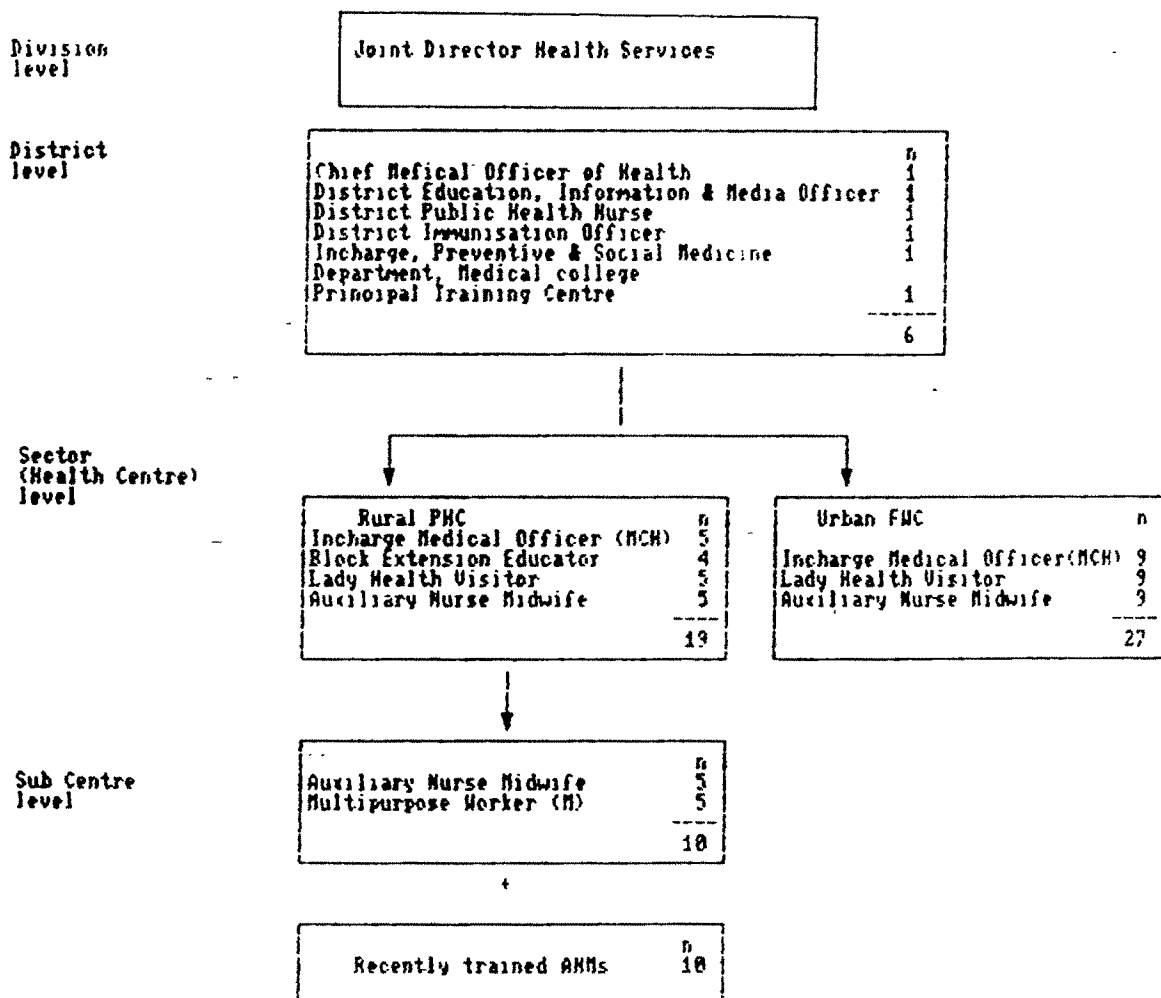




Figure 3(a) FUNCTIONARIES FORMING THE SAMPLE OF THE STUDY (N=72)



Level	Number of officials and functionaries		
	Rural	Urban	Total
1. District level	N.A.	N.A.	6
2. Centre level	19	27	46
3. Subcentre level	10	-	10
4. Recently trained ANMs	-	-	10
Total	29	27	72

N.A. : Not Applicable

III. Selection of beneficiaries

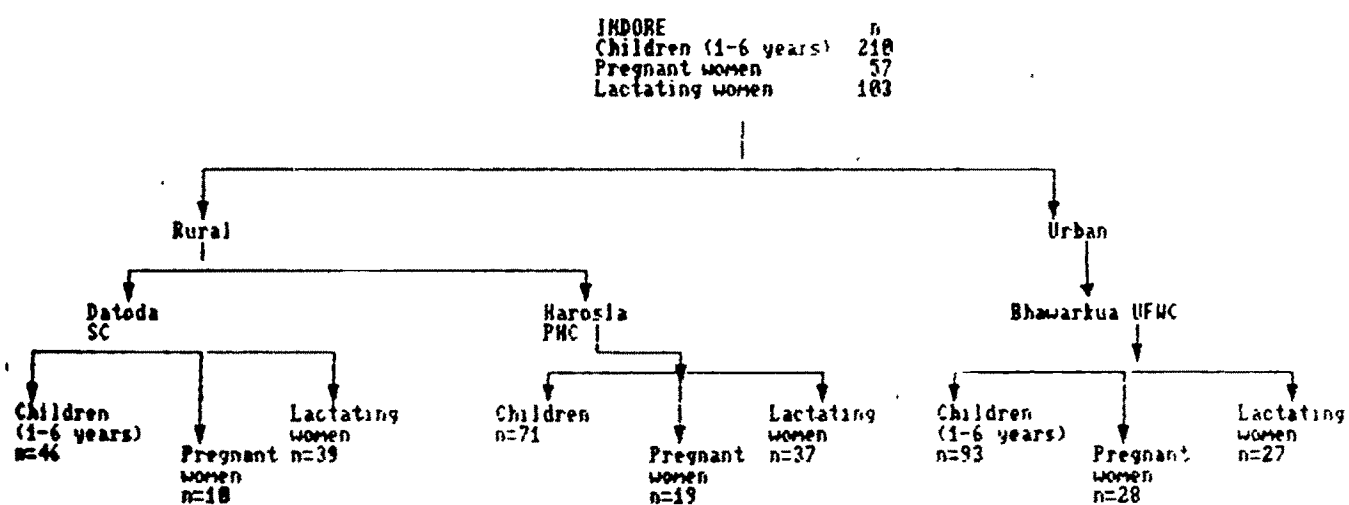
The primary focus of this study was on the Providers of health services. However, it was considered worthwhile to also include Receivers of health services to investigate their perspective of the nutrient programmes and to also assess impact of NAP and VAP. One UFWC, one PHC and one SC were selected to identify the sample of beneficiaries. These centres had the reputation of being 'good centres' in terms of achievements of targets of NAP and VAP according to the perceptions of the district level officials (the DEIMO and the DPHN). It was reasoned that impact on beneficiaries, if any, had the likelihood of being detected in a centre with a 'good programme performance'; and that if even such a centre failed to show any impact, it was less likely that other 'less efficient' centres would do so. A scrutiny of the reports pertaining to programme performance at the centres was also done before final selection of the centres. The rural and urban centres selected for identifying beneficiaries were PHC Harsola, SC Datoda and UFWC Bhanwarkua.

Rural beneficiaries : Permission and cooperation was sought from Medical Officer in-charge of the PHC and the Sarpanch (village head) of the villages in which the PHC and SC were located, for conducting interviews of beneficiaries, clinical examination of eyes and obtaining a finger prick blood sample for the assessment of hemoglobin levels.

Urban beneficiaries : Similarly, for the same purpose, permission was obtained from the Medical Officer in-charge of the UFWC selected and other concerned officials. Cooperation was sought from the teachers and helpers of the Balwadis and community volunteers in the slums covered by the UFWC for collecting the data.

3. Criteria for selection of beneficiaries : During the time of data collection assigned for the beneficiary group, the beneficiaries who were available and willing to give blood sample and to get their eyes examined were included in the sample. It

Figure 3(a) BENEFICIARIES FORMING THE SAMPLE OF THE STUDY



PHC : Primary Health Centre
 SC : Sub centre
 UFHC : Urban Family Welfare Centre

was difficult convincing the parents to allow children to be pricked for a blood sample. Further, the children themselves had to be persuaded a great deal to give a finger prick sample.

The sample size included in the study is depicted in Figure 9(b). It comprised a total of 370 beneficiaries, out of which there were 210 preschool children, 57 pregnant women and 103 lactating women.

METHODOLOGY OF DATA COLLECTION

A judicious combination of qualitative and quantitative methodologies was used to evaluate the management of NAP and VAP. This triangulation that is, using more than one and often three methods or sources is valuable for a balanced perspective and to cross check the data (Chambers 1990), for validation and accuracy (Kashyap 1990) and to capture a holistic and contextual portrayal of the subject (Pederson 1992). While the convergent findings lend support to or validate the study findings, the divergent findings uncover biases inherent in the measurement instruments or methods used (Glik et al 1987). Triangulation can be most effective in a micro approach research (Vlassoff 1989) such as the one used in this study. The various qualitative and quantitative methodologies used in the study are presented below.

The qualitative methods used for data collection in the study were :

1. Observations
2. Scenarios
3. Narratives
4. Ranking
5. Review of secondary data sources
6. Informal interviews

The quantitative methods used were :

1. Structured interviews
2. Biochemical estimation of Hemoglobin levels.
3. Clinical examination of eyes.

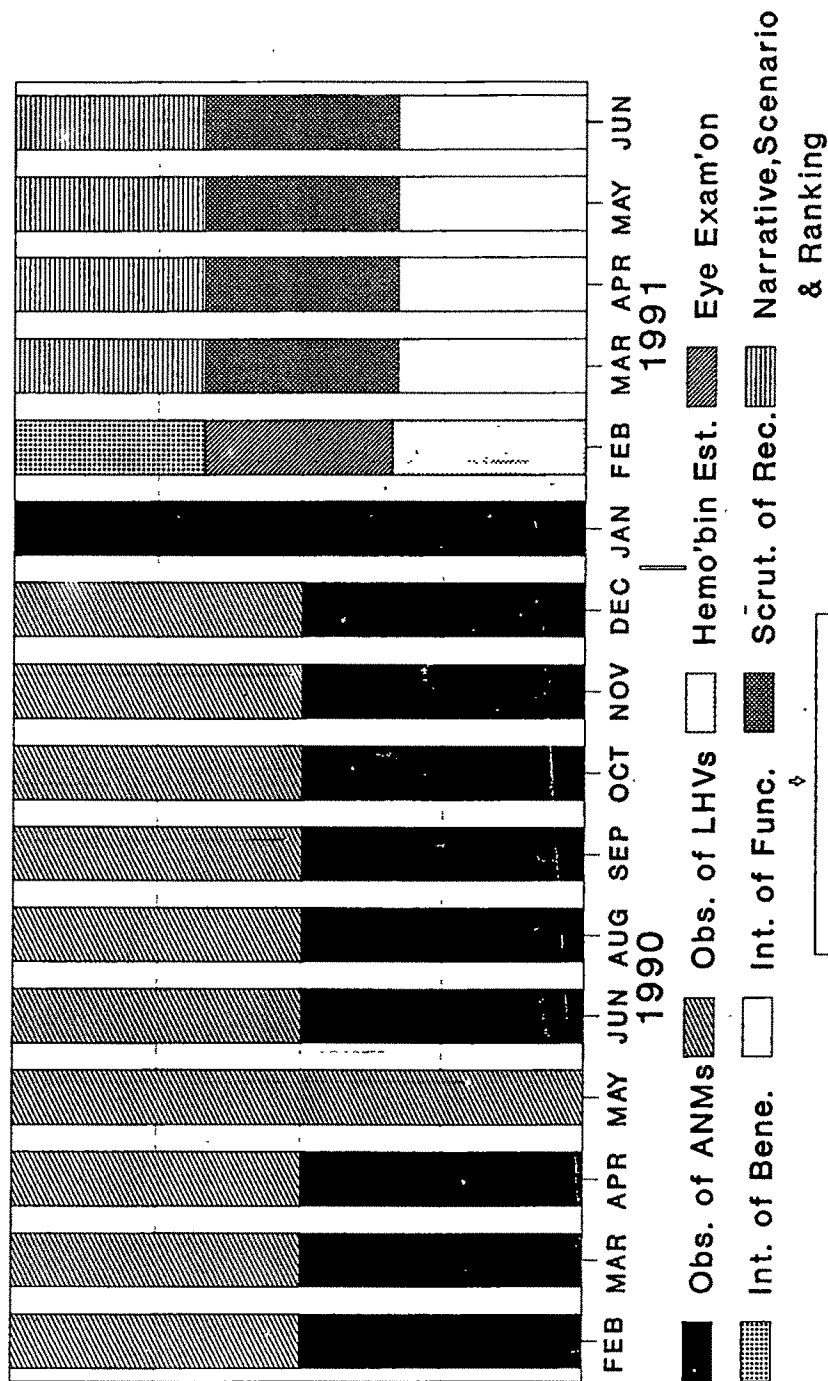
Table (iii) summarises the management indicators and the methods used in the study. Data collection framework used in the study has been shown in Figure 10.

DESCRIPTION OF QUALITATIVE METHODS USED IN THE STUDY

1. Observations

Principle : Ethnographic observation means examining with all of the senses an object, an individual, a group of people or an event with the object of describing it. Careful observation of events and behaviour provides valuable non-verbal clues as to what is actually occurring (Scrimshaw and Hurtado 1987). Lack of correlation between knowledge and actual practice may be revealed through direct observations (Kashyap 1990).

FIG.10 : DATA COLLECTION FRAMEWORK *
USED IN THE STUDY (FEB-90 TO JUN-91)



DATA COLLECTION

* Adapted from Basic Framework Of India
Core Substudies by Johns Hopkins
University (1979).

TABLE (iii) MANAGEMENT INDICATORS AND THE DATA COLLECTION METHODS USED IN THE STUDY

S.N.	Management Indicators	Data Collection Methods
I. Providers' level		
A.	Manpower and Materials	
1.	Educational qualifications	1. Interviews
2.	Knowledge, attitudes and practices related to NAP and VAP	1. Observations 2. Informal interviews 3. Scenarios 4. Narratives 5. Ranking 6. Structured interviews 7. Secondary data review (Diaries).
3.	Work organization and time allocation	1. Observations 2. Interviews
4.	Training related to NAP and VAP	1. Curriculum 2. Interviews
5.	Logistics of iron and vitamin A	1. Observations 2. Interviews 3. Secondary data review (Records)
6.	Transport facility	1. Observations 2. Interviews
7.	Incentives and disincentives	1. Observations 2. Interviews
B.	Monitoring and Control	
1.	Supervision	1. Observations 2. Interviews
2.	Target setting	1. Interviews 2. Secondary data review
3.	Management information system	1. Observations 2. Interviews 3. Secondary data review (Reports, Records and Circulars)
4.	Meetings	1. Observations
5.	Visits	1. Observations 2. Interviews
II. Beneficiaries' level		
1.	Knowledge and awareness related to NAP and VAP	1. Interviews
2.	Haemoglobin level	1. Biochemical estimation
3.	Bitot's spots	1. Clinical examination of eyes

Continuous monitoring (Bernard 1991) or Time frame studies (Bernard et al 1986) focus on direct observation of the activities of individuals for specific periods of time in terms of the central concern of research, and the observations are recorded as faithfully as possible. In the present study, direct and unstructured observations were used to obtain the following data :

1. Knowledge, attitudes and practices of ANMs and LHVs related to NAP and VAP.
2. Work organization and allocation of time to various job functions by the ANMs and LHVs, in particular for NAP and VAP vis-a-vis FPP.
3. Logistics of iron and vitamin A supplements in terms of their procurement, storage and distribution.
4. Transport used by ANMs and LHVs for carrying out their job functions.
5. Incentives and disincentives connected with NAP and VAP.
6. Type and adequacy of supervision provided to ANMs and LHVs.
7. Communication system prevalent between the ANMs and LHVs.
8. Community visits and interactions of ANMs and LHVs with the community.

Procedure : All the rural (PHC/SC) and urban (UFWC) ANMs selected for the study (n=19) were observed at work for a period of one week each. (Total 19 weeks). The rural and urban LHVs (n=14) were observed at work for a period of 3 days each (Total 7 weeks). These weeks of observations were spread over one year as will be subsequently explained. Careful recording of all the activities carried out by the subjects on each work day and time spent on each activity was done. The observations started from the point of time they arrived at the health centre or the field (as the case may be) till the time they stopped work for the day. All the possible details of the job functions carried out by them and their interactions with their superiors and subordinates as well as with the members of the community in formal and informal settings during the working hours were carefully recorded. Remarks made by the functionaries, if relevant to the study, were noted verbatim.

As mentioned earlier, FP is widely believed to receive first priority in the government health sector and it sets the pace for the other programmes. Thus, during December to March, there is intensification of family planning activities to meet the targets by March end to the neglect of other programmes. The MCH programmes receive more priority during other times of the year. To account for these monthly variations, the observations were conducted over one year beginning in February 1990 and ending in January 1991. The observation data were collected during the months of February, March, April, May, June, August, September, October, November, December and January. The month of July was utilized for reviewing the observation data collected and for further planning.

Total time spent in observations : The time spent in conducting observations was 848 hours. However, the actual time spent in

observations was about 2-3 times more than this (about 1697 to 2544 hours) because of several reasons such as frequent lack of punctuality or unexpected absence from duty by the ANMs and LHVs, unavailability of public transport back to Indore, and delayed fortnightly and monthly meetings of the centre level functionaries.

Analysis of observational data

- a. The data collected through observations were categorized into specific job functions performed by each ANM and LHV. Time spent on each job function by each ANM and LHV on each day of observation was calculated in minutes. Average time spent and the range was then arrived at.
- b. The quality of management functions was observed and noted under various categories, such as supervision and communication.
- c. The skills of ANMs and LHVs in implementing NAP and VAP were noted under appropriate categories.
- d. Rich and varied data from the observations was obtained in the form of verbatim responses which are quoted in the Results Chapter as appropriate, to highlight functionaries' perspective in their own words.

The observation data were then analysed from the perspective of various management components as elucidated in the objectives of observations' i.e., logistics of vitamin A and iron supplements, supervision and so on.

2. Scenario

Principle : Informants are presented with hypothetical cases followed by questions regarding the most appropriate course of action according to the informants. The questions are framed in terms of giving advice to someone else (The Johns Hopkins University and Ford Foundation 1990).

Scenarios were designed in the present study with the aim of

- a) assessing the practices of the functionaries with regard to distribution of Iron and Vitamin A supplements to beneficiaries, when the supply of these supplements is inadequate;
- b) assessing the adequacy of information available with the functionaries for orienting beneficiaries to the nutrient programmes, i.e., are functionaries equipped for I.E.C. ?

Procedure : Two scenarios were used in this study. They are as follows. Scenario 1. Mrs Patel is an ANM. On clinic day she finds that small and large iron tablets and vitamin A solution which she is expected to distribute, are in short supply. Both old and new beneficiary preschool children, pregnant and lactating mothers have come to the clinic. Some family planning acceptor

women are also there. What do you think she should do with respect to each of these three supplements?

Scenario 2. Mrs Jacob is an ANM. She is informed by her superiors that a team of state level health officials is coming from Bhopal (capital city of Madhya Pradesh) to evaluate the implementation of NAP and VAP. Hence, she should organize an orientation camp for the community focussing on these two inputs. What do you think Mrs. Jacob should speak about in the orientation camp to the community members?

These scenarios were presented to all the urban and rural ANMs, MPWs, LHVs and BEEs included in the study (n=42). The responses were recorded in textual form, with verbatim responses being noted wherever appropriate in the local language Hindi.

Analysis of scenarios :

Scenario 1. The responses obtained from informants were categorized under the following heads.

- a. VAP : In case of short supply of vitamin A solution ANM should give preference to
 - i. Previously registered beneficiaries
 - ii. New beneficiaries
- b. NAP : In case of short supply of small and large iron tablets, ANM should
 - i. Give preference to previously registered beneficiaries
 - ii. Give preference to new beneficiaries
 - iii. Give fewer tablets to all, both previously registered and new beneficiaries.

Further, among the various target groups of large tablets, she should

- i. Give preference to pregnant women
- ii. Give preference to lactating women
- iii. Give preference to family planning acceptors
- iv. Give fewer tablets to all : pregnant and lactating women and family planning acceptor women.

Scenario 2 : The responses obtained from informants were grouped under the following heads :

- a. Role of vitamin A and iron in the body.
- b. Deleterious effects of deficiencies of these nutrients.
- c. Food sources of vitamin A and iron.
- d. National programmes (NAP and VAP) : dose and frequency of supplements and probable side effects.

Data were scrutinized to detect common patterns in responses among the various categories of functionaries and variations in responses if any.

3. Narrative

Principle : A narrative is a full play by play' description of a past event (The Johns Hopkins University and the Ford

Foundation 1990). Informants are asked to narrate a past event in full detail as it occurred. This makes it possible to obtain a sequential description of an event and to view it through the respondent's eyes : as he/she sees it. A narrative is also an opportunity to ask questions that demonstrate the investigator's interest in the experience and helps in building rapport with the respondent.

The use of narrative in the present study was intended to serve a dual purpose. First, to know whether the respondents ever had a problem with the community in the past which they remembered and considered important. Secondly, the narratives indicated the nature of problems faced by the respondents in their work, and the job functions they were associated with (FP, immunization, NAP, VAP or others).

Procedure : In the present study, the respondents were asked to narrate an incident in detail when they had a problem with the community they were serving, and the action that was taken, if any, to tackle the problem.

The narrative was presented to all the urban and rural ANMs, MPWs, LHVs and BEEs (n=42). The responses were recorded in detail in textual form with verbatim responses to highlight the functionary perspective in an accurate manner.

Analysis of Narratives : Data were studied to obtain the common patterns underlying the narratives. The narratives were classified according to the job function their problem was connected with.

4. Ranking

Principle : Ranking, also called the Rank order method, requires informants to rank items in terms of a specific characteristic (Weller and Romney 1990). The purpose of this method is to obtain data concerning the individual's perceptions of the relative position of various items (The Johns Hopkins University and the Ford Foundation 1990). Some domains lend themselves to being ranked by informants on more than one dimension such as ranking of occupation in terms of prestige or income (Bernard et al 1986).

Ranking method was used in the present study to assess the perceptions of functionaries regarding the job functions performed by them according to three dimensions. These dimensions were time, importance and level of difficulty.

Procedure : The informants were presented with a stack of 11 cards. Each card had one job function written on it. Each informant was asked to arrange the cards in order of relative importance of each job function as perceived by him/her. The ranking given by the informant to each job function in terms of its place in the stack was noted down by the investigator. The cards were then shuffled and the informant was asked to arrange the cards in order of **time spent** on each job function. Again, the ranking given by the informant was noted by the investigator.

The above procedure was followed for a third time for obtaining the relative level of difficulty faced by each informant in performing various job functions.

The informants were allowed to eliminate a card if they were not assigned that particular job function in their work. Similarly, if they felt that any two job functions were at the same level, they were free to indicate the same.

The ranking exercise was conducted for all the urban and rural ANMs, MPWs, LHVs and BEEs (n=42). The ranking given by them on each dimension was recorded from most (rank 1) to least (rank 11) as follows :

- a. Ranking of importance of each job function as perceived by each informant.
- b. Ranking of time spent on each job function.
- c. Ranking of level of difficulty faced in each job function.

Analysis

- a. Ranking on the dimension of importance : Out of the 11 major job functions ranked by the informants, the top two job functions were categorized as most important, the bottom two job functions as the least important and the ones in between as less important. The ranking given by a majority of the respondents was then arrived at.

A similar analysis was done for the other two dimensions i.e. time spent and level of difficulty experienced.

5. Secondary data review

Principle : This method entails reviewing data or materials collected or written up by the persons other than the investigator (Bernard et al 1986). Such archival or documentary data include census records, household register and clinic records and may be published or unpublished. Written records are important sources of information but contain a limited amount of relevant information. Hence, it is necessary to be highly selective about the information abstracted (Annett and Rifkin 1990).

The objective of using secondary data as a method in the present study was to obtain relevant data about the primary health care programmes, so as to place the nutrient programmes being studied within the larger picture of health care in Indore.

Procedure : The various secondary data sources along with the information sought in each, are listed below :

- a. Census abstracts : Census abstracts for Indore district were obtained to get the basic information about Indore district, the site of the study and the health services infrastructure providing primary health care.
- b. Records of health services infrastructure : These were reviewed at the CMOH office and the Preventive and Social

Medicine department of MGM medical College to obtain the latest information about the rural CHC/PHC/SC and urban UFWC.

- c. Circulars : The MCH circulars available in the MCH circulars file for the year 1990-91 at CMOH office, Indore were reviewed to assess the types of instructions and guidelines provided for various components of health programmes especially NAP and VAP. The objective was to find out about the adequacy and type of guidelines communicated regarding NAP and VAP, as circulars comprise an important facet of monitoring of programmes.
- d. Stock registers : Stock registers at district, PHC/SC and UFWC levels for the year 1990-91 were scrutinized to study the logistics of iron and vitamin A supplements being provided under NAP and VAP respectively, and to compare these data with interview responses of functionaries.
- e. Beneficiary registers : The records of beneficiaries supplemented with iron and vitamin A during 1990-91 were examined to obtain information about coverage of beneficiaries under NAP and VAP.
- f. Reports : The reporting procedure was studied with respect to achievements in relation to targets set under NAP and VAP during the year 1990-91, and the maintenance of reports filed at district health centre level.
- g. Daily diaries of ANMs : The ANMs were requested to provide their diaries for the year 1990-91. These diaries were scrutinized with respect to field level performance of their job functions, in particular NAP and VAP.
- h. Curriculum at Family Welfare Training Centre for ANMs : The curriculum was studied at the Training Centre with the objective of finding out the content with regard to NAP and VAP and the proportion of time spent in training for these nutrient programmes in relation to the total training provided.

6. Informal conversations

Principle : Important data can be obtained through informal conversations since people are more at ease in an informal setting and talk more freely (Scrimshaw and Hurtado 1987).

Procedure : Informal conversations were held with various officials at district and health centre level as well as with various functionaries at different points of time throughout the study to know more about the functioning of health services in Indore district and specifically about the nutrient programmes under study. These conversations were especially possible because of the presence of the investigator at various health centres for long periods of time every day for about one and a half years.

In addition, conversations were held with the instructors of the ANM Training Centre which focussed on the training imparted with respect to NAP and VAP, practical experiences provided to trainees and the importance given to these two programmes relative to the other health programmes.

DESCRIPTION OF QUANTITATIVE METHODS USED IN THE STUDY

1. Interviews

There are three broad categories of interviews depending on the degree of control or structure:

- a. Unstructured interviews, which exercise a minimum of control over the informant's responses (Bernard 1991).
- b. Semi-structured interviews, which follow a predetermined pattern but their substantive focus shifts according to the responses of the informant (Bernard et al 1986).
- c. Structured interviews, which involve asking same questions to every informant in a particular order, in such a way that reliable comparisons can be made between the responses (Kanani and Consul 1993, Bernard 1991).

An important type of structured interviewing is structured domain interviewing in which a group of systematically chosen informants are asked questions (generally open-ended) about the same set of topics (Bernard et al 1986). This was the method used in the present study.

Procedure :

I. Interviews of Functionaries : Both urban and rural functionaries in the PHCs, SCs and UFWCs, senior district level officials and recently trained ANMs were interviewed using different sets of interview schedules. These interview schedules were pretested and subsequently modified on the basis of results of pretesting. The schedules are presented in the Appendices (I to IV). The interview schedules for the grassroot level functionaries (ANMs and MPWs), their supervisors (LHVs, BEEs and MOs) and the district officials sought to elicit information on the following main domains. Additional information was sought from different categories of functionaries wherever relevant.

- a. Educational and other qualifications and work experiences.
- b. Inservice training.
- c. Perceptions of their roles in implementation of NAP and VAP.
- d. Knowledge, attitudes and practices related to NAP and VAP.
- e. Work schedule on various days of the week.
- f. Logistics of vitamin A and iron supplements.
- g. Infrastructural support provided.
- h. Type and adequacy of supervision.
- i. Targets provided for NAP and VAP.
- j. Visits to the community made by them.

2. Interview schedules for recently trained ANMs (N=10) contained questions regarding

- a. Educational qualifications.
- b. The subjects taught and instructional methods used in their preservice training; their views regarding the same.
- c. Information provided in the training in connection with NAP and VAP.

- d. Knowledge regarding the various aspects of implementation of NAP and VAP.

The functionaries were encouraged to talk freely without interruptions while they were being interviewed.

II. Interviews of beneficiaries : A total of 328 beneficiaries of NAP and VAP including pregnant women (n=56), lactating women (n=101) and mothers of preschool child beneficiaries (n=171) were interviewed in urban as well as rural areas (Appendix V). The beneficiaries were encouraged to talk freely. Gentle probes were made wherever required in order to gain insight into their perceptions of Iron and vitamin A supplements in the context of the services provided by the health system as a whole. Care was taken to note verbatim responses as far as possible.

Information was sought from them on the following aspects.

- a. Socio-economic profile of beneficiaries.
- b. Perceptions of beneficiaries regarding the benefits and side effects of supplements.
- c. Receipt of complete/partial doses of iron and vitamin A supplements.
- d. Regularity of receipt of supplements.
- e. Nutrition health education received related to NAP and VAP.
- f. Beneficiary and adherence to supplements and its monitoring by functionaries.
- g. Discontinuation of supplements and the reasons for discontinuation.

Analysis :

Percentage responses were calculated for all the indicators used in the study based on the responses given by the officials, functionaries and beneficiaries included in the sample.

2. Estimation of Hemoglobin by Cyanmethemoglobin method (INACG 1985 and Oser 1979) using Filter paper technique (NIN 1974)

Principle : A sample of blood is mixed with a solution containing potassium ferricyanide ($K_3 Fe [CN]_6$) and potassium cyanide (KCN). Ferricyanide oxidizes the Hemoglobin to Methemoglobin which is then reacted with cyanide ion to form cyanmethemoglobin. The cyanmethemoglobin formed absorbs light at 540 nm and is a very stable compound.

Standardization : A series of standards were run using standard Cyanmethemoglobin solutions. A standard curve was constructed using the spectrophotometer readings and the known concentrations (Appendix VI). From the standard curve a factor of 36.77 was obtained which could be used for estimation of hemoglobin content of samples.

Procedure :

1. Collection of sample : The middle or ring finger of the left hand was cleaned thoroughly with a spirit swab and dried with

tissue paper. Holding the finger firmly in one hand, a sharp prick was made with a sterile disposable lancet with the other hand. The first drop of blood was wiped away. Then 0.02 ml blood was collected in a Hemoglobin micropipette taking care to avoid formation of air bubbles inside the pipette. The tip of the pipette was wiped and the blood was blown gently on a piece of filter paper (Whatman filter paper No.1) in concentric rings. The blood was air dried, appropriately labelled and put in a box between layers of butter paper to avoid contamination of one sample with another.

2. Estimation of Hemoglobin : In the laboratory, the portion of the filter paper containing the blood was cut out carefully and dipped in 5 ml of Drabkin's reagent which had been previously measured out in a labelled test tube. The reagent solution was shaken slightly after adding the sample. The sample was allowed to elute into the reagent for a minimum of 30 minutes. Then the sample and the reagent were mixed well and the readings were taken at 546 nm on Semi-auto analyser photometer (Model 4010, Make : Boehringer Mannheim).

Analysis of data

Mean and Standard Error (SE) was calculated for Hemoglobin levels of pregnant and lactating women and preschool children in both urban and rural areas.

3. Clinical examination of eyes for presence of Bitot's spots.

Principle : There are five well recognized ocular clinical manifestations of vitamin A deficiency. These are night blindness, conjunctival xerosis, Bitot's spots, corneal xerosis and Keratomalacia (IVACG 1989). Bitot's spots are easily recognized, are a relatively specific marker of active vitamin A deficiency among preschool age children and are appropriate for use in the prevalence field surveys (WHO 1982, Sommer 1982, Sommer et al/ IVACG 1976).

Procedure : Standardization of the method for detecting the presence of Bitot's spot was done under the supervision of a trained senior colleague of the Department of Foods and Nutrition, M S University, Baroda. In the field, the detection and recording of the presence of Bitot's spots was done in accordance with the guidelines suggested by WHO (1982).

Analysis : Percent prevalence of Bitot's spots in preschool children (both receivers and non-receivers of vitamin A supplement) was calculated in both urban and rural areas.