METHODOLOGY

The study aimed to explore some of the lacunae in the previously conducted studies discussed in the preceding chapter. It attempted to understand what diarrhoea meant to the selected population. What people did when their children suffered from diarrhoea and the problems they encountered in acquiring access to various kinds of services available.

In seeking answers to these questions diarrhoea was treated as a problem in the hierarchy of health problems in children. In addition, an attempt was made to understand the reasons for the current child feeding practices (selection of foods, the quantities consumed, the frequency of feeding etc); were these dependent on availability (locally) or inability to buy them for economic reasons or were there other reasons for not giving a child appropriate foods.

This study attempted to locate the occurrence of diarrhoea and its management within the given specificity of the socioeconomic context ie an urban slum where a migrant population from rural areas had settled and urban influences operated and interacted together with traditional beliefs and practices.

The study utilized an approach in which the household management of diarrhoea was perceived as the outcome of multiple interacting environmental factors (the environment being envisaged as comprising of several components physical, social and cultural) to understand the various patterns of home management of diarrhoea
prevalent in this community and to assess the factors which accounted for the different patterns of diarrhoea management in this population.

The social economic and cultural factors were not treated as isolated entities but as an overlapping inter linked dynamic reality which was ever changing.

Its focus was areas which are critical in assessing the validity of assumptions regarding effectiveness of the programme. The observations from this study should help understand the appropriateness or otherwise of the current approach to the prevention and treatment of childhood diarrhoea in a slum situation.

Hypothesis

The event of diarrhoea in under fives in a slum population, the response to the disease and its consequences is essentially an outcome of their environmental (physical, social, cultural) situation and is not just the lack of information regarding availability and impact of technological interventions.

To test this hypothesis the study was conducted with the following objectives.

Objectives

A. Social Context of the Selected Families

What is the status of women in the selected families. What is the father’s contribution towards child rearing? What is the
relative role of the individual members in the event of illness in a child. What is the social status of the families selected for study. What is the quality of their interaction with other families belonging to the same strata and with those belonging to other strata. What are their resource bases. What is their access to facilities for health care, education, employment, entertainment, sources of water supply etc. Do these in any way explain the occurrence and patterns of diarrhoea, the response to this illness or to its outcome

B. At the level of the family
1. Questions pertaining to diarrhoea.

a. What are the specific explanatory models for diarrhoeal disease in this population? This would include identification of the classification system for diarrhoea, each perceived entity identified by its own label, symptomatology and perceived causation and how these affect peoples choices of diarrhoea management (traditional therapies, medical treatment, feeding and fluid behaviour).

b. Is childhood diarrhoea perceived to be a problem in this population? If it is perceived as a problem, what is the status of this problem when viewed in the hierarchy of health problems as perceived at the level of the family? Also, is medical assistance, in terms of treatment or interventions to prevent diarrhoea a felt need in this community.
2. Questions pertaining to feeding during Diarrhoea

a. What are the prevalent feeding practices as regards selection of foods, their quantity and frequency of feeding? What determines these practices, whether what is offered is a function of availability of food or despite availability perceptions of 'hot' and 'cold', 'helpful' and 'harmful' food affect the choice of food that is actually offered?

b. What are the modifications in diet practiced during diarrhoeal episodes and convalescence and the reasons for these.

C. Home and medical treatments during Diarrhoea

1. Is medical or other treatment sought commonly for the treatment of diarrhoea. When is diarrhoea perceived to be serious to merit a response within the household or from outside (in terms of illness characteristics, factors related to the child etc). When is diarrhoea thought to be mild. What features in an episode classify it as mild not meriting any treatment.

2. What are the sources of treatment available in an urban slum and their utilization by the population. This included identification of the constraints, if any in their utilization and the factors which prompted families to firstly seek help and secondly, select a particular source.
3. Is the quality of services offered at these health care facilities and private practitioners optimal from the people's perspective. If not why.

D. Programme related questions

1. Is the DDC programme operational in this area? What is the health personnel's understanding of ORT

2. Have the messages of the programme reached the people. If yes through which source. Is ORT being utilized in this population. Who uses it. In users what is the form of ORT used. What is their perception of its role. Are the ingredients available at home or are they procured from outside. Are they satisfied or dissatisfied with it. What factors relate to its non use. Are ORS packets freely available in this area.

Data required

To test this hypothesis and explore questions arising from the objectives data was collected on:

Names by which various types of diarrhoea are recognized in this population with symptoms and perceived causes for each type.

The management of each type of diarrhoea named, whether treatment is sought for it, if yes the type of treatment sought; medical treatment, traditional therapies etc.

Whether diarrhoea is perceived as a health problem in infants and young children as regards morbidity and mortality. If yes is it
perceived as a serious one in the hierarchy of total problems at the level of the family.

What is the proportion of infants that are breast fed in this area. When does breast feeding begin and when does it cease.

What foods liquid or solids other than breast milk are used in the first four months of life (when these are not usually recommended) or beyond the initial 4-5 months of life. What factors influence these practices for eg factors underlying non initiation of breast feeding or its premature cessation. Does the pattern of breast feeding change during diarrhoea ie do mothers withhold breast milk.

How is diarrhoea managed in the household. Is there a change in diet during a diarrhoeal episode. Is there an emphasis on feeding the child foods that are considered 'helpful' and a reduction of foods considered 'harmful'. What are these 'helpful' and 'harmful' foods and why are these perceived to be so.

Is the child's appetite decreased as perceived by the mother. If the child's feeding is inappropriate (quality and quantity) during diarrhoea is it a continuation of similar feeding practices when the child was not ill; in other words, are the routine feeding practices in children in the area inappropriate or inadequate (due to various reasons; availability of foods, economic reasons, awareness etc.)

What are the sources of health care available in an urban slum. These would include identification of government dispensaries, private practitioners (medical, ayurvedic, unani and
quacks) and traditional healers. How often are home remedies for diarrhoea used. Is medical treatment commonly sought for the treatment of diarrhoea

What is the proportion of people seeking treatment from private practitioners and those from the government health system and what are the reasons for seeking treatment from each. Does the gender of the child influence health actions. Does the perception of the cause of diarrhoea influence the source of treatment e.g. does ‘teething’ diarrhoea receive no treatment.

Do mothers restrict fluids during diarrhoea or do they increase the quantities of those perceived to be beneficial. Is the use of ORT influenced by knowledge and beliefs about diarrhoea and by demographic and socio economic factors. Is the use of ORT influenced by the understanding of functioning of ORT i.e. do those who understand the concept of dehydration more likely to use it. Is availability of time (due to preoccupation with household chores) a major constraint to preparation and administration of ORT.

Have the messages of the programme reached the majority in this population. Of those who are aware about the programme is it perceived to be of use.

Selection of the area for study

The study was carried out in an urban slum. To select the area a list of all the JJ camps (‘jhuggi jhopdi’ clusters) in Delhi was sought from the DDA slum wing. This data was available through a
study carried out by the Institute of Socialist Education in the year 1989 and procured from the Director Planning, DDA Slum Wing (ISE 1989).

To improve the generalizability of the findings an attempt was made to select a 'typical slum' from the extensive list. Using an arbitrary definition of 'typical' the following criteria were used for selection:

The size of the slum was not too large or too small (the list comprised of slums with populations ranging between 600 individuals to 40,000).

The slum had been in existence for at least five years thus allowing for a sufficient period of time for the interface between rural and urban influences and the resultant influence if any, on health seeking behaviour.

The population had representation from several regions of India to facilitate observation of any cultural influences in the household management of childhood diarrhoea.

The means of earning a livelihood were several so that differences in help seeking across economic groups could be observed.

The population was stable with low rates of out migration to permit for uninterrupted observations.

With these considerations in mind a few slums were short listed. These were visited several times by the investigator. Five were short listed and ultimately the Janta Jeevan camp at Tigri
(Dakshinpuri) was selected because of easier accessibility to the investigator.

2.1 Pilot study

For the initial three months ie between August and October 1990 I familiarized myself with the selected area. An attempt was made to study the physical aspects of the slum, its people, the institutions present in the slum and the people providing services in these institutions.

During these visits, information was sought on the following:

1. The physical aspects of the slum, the geographical distribution of households, public amenities like hand pumps, latrines, schools, balwadis, post offices, banks and environmental sanitation.

2. Availability of supplies for daily use; food stuffs, vegetables, clothing and also of luxury goods like television, radios and refrigerators.

3. Characteristics of the inhabitants; their states of domicile, settlement pattern, castes, religion, occupation, family size, cultural background e.g. beliefs, customs, kinship separately for people belonging to different states, the mechanism of decision making in the home and for group activities, power structure and economic and political structure.
4. Perceptions and responses of the people to illnesses, childhood disorders, pre and post natal care, communicable diseases, non communicable diseases, injuries and nutritional disorders. The main focus however was on childhood diarrhoea.

5. The sources of health care available in an urban slum ie government dispensaries, private practitioners (medical, ayurvedic, unani and quacks) and traditional healers. Also the sources of referral outside the slum.

6. Other agencies providing services in the area e.g. ICDS, Lok Kalyan Samhitis, Mahila mandals etc. and the quality of the interaction between the personnel working in them and the people.

On these visits I also sat with women and observed them cooking food, cleaning wheat before taking it to the mill for grounding, sweeping the floor, washing clothes and utensils and bathing, feeding and playing with their children. Mothers were observed doing petty jobs at home; jobs which were labour intensive but fetched them nominal sums of money like making bindis, pasting them on folders, cleaning ‘chana’ (roasted Bengal gram), making balls of wool from entangled loose wool and embroidering cushion covers and quilts.

On several occasions mothers were accompanied to the market place, to the fair price shop, dispensary, private practitioners,
their child's school and to balwadis to ascertain the location of these places and also to observe the mothers' interaction with different people.

The pilot phase was used to collect qualitative information on areas identified in the previous section. Once all the areas on which data were required were covered and no new information was forthcoming the pilot phase was complete.

This phase also helped me to crystallize the sampling strategy for selection of households for the indepth study.

2.2 Indepth study

The initial pilot phase was followed by studies to understand health seeking behaviour and feeding and fluid behaviour during diarrhoea.

To identify episodes to study health seeking behaviour one approach could be to visit several households a day; enquire about occurrence of recent episodes of diarrhoea and if an episode had occurred, record details about the health seeking behaviour for that episode. The advantage with this approach is that repeated visits are not made to households during the episode, a phenomenon believed by many as likely to influence health seeking behaviour.

In another approach, a group of families are enrolled and a minimum surveillance is conducted to identify cases of diarrhoea. The investigator visits the household only after he is notified regarding the occurrence of an episode. The disadvantage of this approach according to some is, that if the surveillance is
intensive then it might itself change the health seeking behaviour. In this study the second approach was adopted but it was modified slightly so as to reduce the bias of repeated visits by the investigator.

Theoretically, there may be an advantage in studying health seeking behaviour in households after an initial period of familiarization. During the initial visits the families perceive the investigator as an 'outsider' and would therefore be on their 'best' and also report 'ideal' behaviour. Subsequently, once they got used to his presence they would go about their functions more naturally.

A field worker was recruited and she visited selected households once in 5 days to enquire whether the child was well or not. Whenever a case of diarrhoea was encountered the investigator was informed.

The qualitative study of health seeking behaviour was done in detail on the first episode of diarrhoea in the enrolled children. This approach ensured that repeated interrogation was not done before or during the diarrhoeal episode; an issue about which some investigators have expressed concern. However, an attempt was made to seek information on health seeking behaviour for all episodes occurring during the study.

Further, it was felt more appropriate to recruit a cohort because an episode of diarrhoea and the family's response to it was viewed not in isolation, but in the context of multiple and interacting environmental (physical, social and cultural) factors.
It was originally envisaged that after the study on health seeking behaviour was complete the services of the field worker would be discontinued and the investigator would determine a contact point wherein whenever a child in the enrolled families was ill the mother would inform the investigator or leave a message so that the investigator could visit that home as early as possible during the illness. Subsequently, it was realized in the initial few weeks that most mothers being burdened by household chores, in addition to taking the child for treatment would not be able to make an additional trip first to inform the investigator and the identification of episodes would have to be done at home. It was therefore decided that for efficient identification of diarrhoeal episodes the minimum surveillance system be retained. The field worker made 12-15 household visits each day and informed the investigator whenever there was any morbidity in the selected child or any other family member and also whenever there was any event of interest or crisis in the household unrelated to illness.

As the primary objective of the visits was to study health seeking behaviour and my being a doctor or being identified with health personnel would lead to seeking medical advice from me (thus distorting usual behaviour), throughout the study I did not reveal my background. The explanation given to the selected households and other people who enquired was that I was a student of a university undergoing training in field methods and that as a part it I was studying this particular JJ cluster the aim being to study the inhabitants way of life and the conditions under which they lived.
Selection of the cohort for the indepth study

The study sample was limited to the selection of 60 families with at least 1 child aged less than 60 months as this was thought to be the maximum the investigator could handle without compromising on depth. To select these families two options were available; a random selection from the total population of the camp or selection of families from a defined area.

As it was also aimed to assess the quality of interaction of the selected families with other families and to maximize time available for observation (as against walking large distances to cover individual families) it was felt that the selection of these families from one block (ie a limited area) would be more appropriate. This view was further justified by the fact that the study conducted by the DDA slum wing had revealed that there were no major variations within the populations residing in different blocks in terms of incomes, occupations or states of domicile.

The Janta Jeevan camp at Tigri is divided into seven blocks numbered alphabetically. Each block comprises of 500-700 jhuggis; all the jhuggis have aluminium number plates put up by the area rationing office. The number plate bears the code of the slum (S 09 in this case). The blocks and the number of households in each block are numbered as follows.
<table>
<thead>
<tr>
<th>Block number</th>
<th>Household numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1-507</td>
</tr>
<tr>
<td>B</td>
<td>1-700</td>
</tr>
<tr>
<td>C</td>
<td>1-639</td>
</tr>
<tr>
<td>D</td>
<td>1-590</td>
</tr>
<tr>
<td>E</td>
<td>1-592</td>
</tr>
<tr>
<td>F</td>
<td>1-302</td>
</tr>
<tr>
<td>G</td>
<td>1-573</td>
</tr>
</tbody>
</table>

As health seeking behaviour is known to be affected by proximity to a health centre each block was mapped in relation to the solitary health centre in the area. Ultimately block C was selected as it lies at a median distance from the dispensary.

The population in this block is represented by several states and as child rearing practices and health seeking behaviour are culture specific it was decided to stratify the selected families by their states of domicile. To ascertain these, a quick survey was carried out wherein the state of origin was ascertained for each family and separate lists were prepared for families from different states.

Out of the 639 families, 335 belonged to UP, 111 to Rajasthan, 77 to Bihar, 9 to Haryana, 3 to West Bengal, 8 to Delhi, 1 to Maharashtra and 2 to Madhya Pradesh giving a total of 546 families whose states of origin could be ascertained. Ninety three households were excluded because the jhuggis were broken or were
locked for long periods and their neighbours had no information as to when their inhabitants would return.

The proportion of households selected from each state was based on the proportion observed in the study carried out by the DDA (ISE 1989) i.e. 50% from UP, 35% from Rajasthan and 15% from 'other' states. Ultimately 30 households were chosen randomly from the list of 335 families from UP, 21 from the list of 111 from Rajasthan and 9 from the 100 families belonging to 'other' states (Bihar, Haryana, West Bengal, Delhi, Maharashtra and Madhya Pradesh).

The household listed in the randomly generated list was first located in Block C. If the household included any child aged less than 60 months it was enquired whether the family would be moving out of the area within the following year. If the response was negative, only then the family was informed about the study and children aged less than 5 years were enrolled after obtaining prior consent. If the visited household did not have a child aged <60 months or if the family was likely to move out of the area within the next year then the next household (serial number) was contacted and after ensuring that their state of origin was the same, the procedure was repeated.

The day a household was identified for enrollment a bare minimum information was recorded in the household information form (Appendix I, Form I). The baseline weights and heights of the enrolled children were obtained. Detailed information on the household was sought over several weeks. Sensitive issues like
income, family planning and intra family relationships were discussed only after a rapport was established with the family.

**Health seeking behaviour**

As soon as a diarrhoeal episode was identified by the field worker, I was informed (Appendix 1, Form II, III). I made the first visit to the household about 7 days after onset of the episode.

During the visit an interview was conducted with the caretaker of the child to find out the type and cause of diarrhoea as perceived by her, whether any treatment was given as a response to the illness in the form of home remedies or from outside the home and also details about the sources from which treatment was sought in a sequential manner.

An attempt was made to ascertain what factors prompted a mother to seek external help, the pattern of help seeking outside home and the decision to seek help from a particular source. The other important focus was to understand why help was not sought when indicated and how far situational constraints like mother’s available time and money were significant determinants of referral practices.

Information was sought on the type of treatment and fluid and feeding practices adopted during the illness. Details were sought about the doctors’ advice. The cost of treatment for each episode was also calculated. The home remedies and medication given along with prescription slips if available, were all examined (Appendix 1, Form IIIC).
Health seeking behaviour in prolonged episodes was studied distinct from acute episodes because in some settings prolonged episodes have been found to be important in causing nutritional decline. A repeat visit was therefore made after 7 days in which details about continuing (persistent) episodes were sought. This second visit enabled me to elicit changes in treatment seeking and in fluid and feeding behaviour as a response to the prolongation of the episode.

**Feeding and Fluid intake during diarrhoea**

Observations regarding feeding and fluid behaviour were focussed on episodes that were detected early or during the acute phase (i.e. between day 1 to day 3 of the illness). The 24 hour recalls were restricted to the age group 0-36 months as this is when interaction between feeding, diarrhoeal illness and children's growth is most important. The underlying aim was not to collect quantitative data but to see if there were some commonly adopted behaviours linked to particular types of diarrhoeas; types as perceived by the community and by common medical wisdom and understand factors associated with the most commonly prevalent behaviours.

When an episode of a day or two duration was reported to me in a 0-36 month old child, I visited the household the same morning.

Basic information on the episode characteristics was recorded and a 24 hour recall was performed on the foods and fluids consumed on the previous day (Appendix 1, Form IIIA, B, and C). Repeated
visits were made during the illness and during convalescence. Often, several visits were made on the same day of illness.

My effort during these visits was to obtain an understanding of whether feeding including breast feeding was continued during diarrhoea or not; what foods were offered during the illness, their content and frequency; the thickness or thinness of the foods offered (energy density), the diversity of the foods used, their preparation, mode of offering and any omissions or additions of any specific foods.

Repeated visits provided an opportunity to watch children with diarrhoea in the acute phase or when the illness became prolonged; with or without complications like fever, vomiting and blood in stools and observe the differences in child and maternal behaviour between the different types of illnesses.

The preparation of foods given to these children was observed on several occasions. This often entailed waiting in the home while the food was being cooked. Ingredients used for preparing a feed, the method of cooking, the utensils used, the condiments and oil added and ultimately how the child was fed were also observed.

Since it is often claimed that mothers significantly reduce or modify feeding during diarrhoea I particularly focussed on the mothers’ effort to feed the ill child; whether this effort was the same as pre illness, greater or reduced, the last mentioned being reflected as reduction in the frequency, quantity and consistency of foods offered to the child during diarrhoea.
An attempt was made to identify factors associated with both positive and negative behaviours ie with mothers who attempted to feed the child optimally and those who did not, children who accepted food readily and those who were anorexic; the purpose being to see if explanatory models could be constructed related to these behaviours, the factors of interest being types of illness, those related to the family, the child or to the environment.

It needs to be emphasized that while these focussed observations were made on a small number of episodes some basic information on feeding continued to be obtained till the end of the study period.

24 hour dietary recall during health and diarrhoea

A 24 hour dietary recall was conducted in children aged 0-36 months in health and during diarrhoea in the indepth study on feeding and fluid behavior described above (Appendix I, Form IIIA, IIIB). A similar recall was repeated for the same children after recovery of the diarrhoeal episode at a time when the child was free of any major morbidity (diarrhoea, pneumonia, AURI, fever and any illness requiring hospitalization) in the preceding two weeks.

The mother was asked to recall the food intake of the child, beginning from the time the child woke up in the morning on the previous day up to the same time on the day the interview was conducted. Detailed descriptions of foods and beverages consumed, cooking methods and brand names were recorded. Vitamin and mineral
supplements were also noted. The quantities of foods consumed were estimated in household measures.

Observations were made regarding use of fluids in households, which fluids were used routinely or because of diarrhoea, their preparation, storage and mode of feeding. Also on fluids used normally, those promoted by the programme like tea, lassi, lemon water, sugar salt solution, cereal based fluids and ORS packets; factors associated with appropriate fluid therapy and factors associated when fluids were not offered in sufficient quantities (social, economic, time constraints). The effect of age and seasons was also noted on the behaviours observed.

Availability of foods in the home

A random spot check spread over different months and different periods in each month was done in the enrolled households to assess the availability and quantity of common food stuffs in homes. Five households were checked each month; one every sixth day. The mother was asked what she stocked in her kitchen; on most occasions she even opened each tin and showed me its contents. The list of foods available with their approximate quantities were noted for each household.

Household surveillance

The follow up of 1 year was necessitated to obtain an adequate number of episodes to be observed for these behaviours during different seasons of the year and also to observe variations in
these practices with changing situations in the household. In addition, this also permitted an estimate of the disease burden, although this was not the primary goal of the study (Appendix 1, Form II).

**Anthropometric assessments**

Weights and heights (lengths for children aged <2 yrs) were taken for all children at the beginning of surveillance period ie between Dec 1-5, 1990 and subsequently every six weeks.

Weights of children were taken to the nearest 50 gm using a portable Seca weighing scale. Children were weighed wearing only a single shirt. Lengths were measured to the nearest 0.25 cm in children aged less than two years using an infantometer.

Heights were measured in children aged more than two years using a portable height measuring instrument known as a 'microtoise'. The child’s height was measured to the nearest 0.1 cm.

For the comparison of children according to their anthropometric measurement the commonly used indicator of weight for height as percent of NCHS standard has several potential limitations. Firstly, it does not differentiate between wasting which is a measure of recent malnutrition from stunting which is an indicator of chronic malnutrition. Secondly, these children might have oedema which could give a false impression regarding their weight. Thirdly, the degree of malnutrition indicated by a certain proportion of percentage weight for age varies with age and thus
denotes different degrees of malnutrition at different ages. For these reasons anthropometric classifications based on standard deviation scores are preferable although fraught with the problems of being infrequently used because of computational difficulties.

For the purpose of this study the software EPI INFO version 5.0 from CDC Atlanta (USA) was used to compute Z scores for weight for height and height for age for all measurements of weights and heights.

This method also obviates the problem of inaccuracies due to age and dates of birth not being available in most such settings. However, in this population this was not a major problem as accurate dates of birth were available for 95% of children.

For purposes of comparability, weight for height and height for age were also analyzed using cut offs recommended by the Indian Academy of Pediatrics.

**Experience of child deaths**

During the first month of the study (December 1990) all mothers in the enrolled households were interviewed to obtain their maternity histories. Each mother was asked about her most recent or the last birth and then the second last birth, the third last birth and so on. The information sought from the mother pertained to the dates of these deliveries, the sex of children born and whether they were living or dead. If a death was reported then the date of its occurrence was obtained.
For all child deaths thus identified and occurring when the age of the child at death was less than 4 years and 11 months a verbal autopsy was conducted to ascertain the cause of death.

Verbal autopsies involve obtaining information from interviews with relatives of the deceased person to reconstruct the illnesses leading to death. The basic premise in using this method is that the diseases of interest have characteristic signs and symptoms which can be recognized and recalled by the respondent at the time of the interview and that these characteristics are sufficiently distinctive to differentiate the diseases of interest from other conditions with which they might be confused.

Two distinct sets of forms were designed; one for neonates and the second for older children (Appendix 2). The questionnaire administered to the mother included open ended, closed and categorized questions. In both forms the common causes of deaths in that age group were enumerated and under each the most common signs and symptoms were listed. The mother was asked each sign and symptom and those present in the child before death were marked along with their durations. The cause of death as perceived by the mother was also recorded. After the interview the underlying, immediate and associated causes of death were decided based on the temporal ordering of illnesses preceding death and medical knowledge regarding relationships between diseases. All completed forms were given to a physician for this purpose who coded the cause of death according to the WHO international classification of diseases.
The deaths which occurred in the past were identified at the initial survey conducted in the first month of the study. Subsequent deaths (only one occurred during the study period) were identified during routine visits to these households, the maximum interval between two visits by a field worker being 7 days.

The time interval between the death of a child and the time of conducting the interview was ≤1 year in 6 deaths (12.2%), between 2 and 5 years in 11 deaths (22.4%) and more than 5 years in 32 deaths (65.3%). The median interval was 7 years. For the death that occurred during the study period this interval was reduced to that which is believed to be optimal i.e. 8 weeks (Gray 1990).

All interviews were conducted with the decedent’s mother. In addition to this, wherever possible, an attempt was made to interview the father, health workers, doctors, relatives and neighbours i.e. all those who had been in contact with the child.

Wherever possible information was supplemented by examining any medical records available (prescriptions, investigation reports), growth cards, birth certificate, death certificate and containers of medicines which had been administered to the child.

A possible limitation of these interviews could be the long period of recall in some. This may have led to under reporting of signs and symptoms which could have affected the coding of the cause of death. Another major problem was that inherent in the method of verbal autopsy itself. It was very difficult to gauge how much of the mother’s narration was actually ‘true’ because there were no means to validate these findings with actual medical
records. In none of the interviews could any documents be found; even if these had been given to the family they had been destroyed after the death of the child.

2.3 Population survey

At the end of the indepth study a population survey was conducted to assess the validity and generalizability of findings obtained from the indepth study. Mothers in 200 households with at least one under five were interviewed to assess their knowledge, attitudes and reported practices with regard to diarrhoea management in children.

Selection of households for the survey

The total households in the area were each allocated a number between 1-3903. The method used to allocate numbers is shown in Table 2.1.
Table 2.1 Allocation of serial numbers to households in Tigri

<table>
<thead>
<tr>
<th>Block</th>
<th>Household numbers on jhuggi</th>
<th>Number allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1-507</td>
<td>1-507</td>
</tr>
<tr>
<td>B</td>
<td>1-700</td>
<td>508-1207</td>
</tr>
<tr>
<td>C</td>
<td>1-639</td>
<td>1208-1846</td>
</tr>
<tr>
<td>D</td>
<td>1-590</td>
<td>1847-2436</td>
</tr>
<tr>
<td>E</td>
<td>1-592</td>
<td>2437-3028</td>
</tr>
<tr>
<td>F</td>
<td>1-302</td>
<td>3029-3330</td>
</tr>
<tr>
<td>G</td>
<td>1-573</td>
<td>3331-3903</td>
</tr>
</tbody>
</table>

Two hundred households were selected randomly, from between 1-3903 households. The selected household was first visited. If the family was available and the household had a child aged less than five years consent was obtained for conducting an interview with the mother. If the mother was willing, she was interviewed. The form used in the interview is shown in Appendix 3.

If the home did not have a child aged less than 5 years then the jhuggi next in serial order was visited and the procedure repeated. All the selected mothers gave consent.
Description of selected households

The distribution of households selected by this method and where interviews were conducted was; block A 47 (23.5%), block B 29 (14.5%), block C 25 (12.5%), block D 25 (12.5%), block E 8 (4.0%) block F 28 (14.0 %) and block G 38 (19.0 %).

The age and sex distribution of under fives in these households is shown in Table 2.2.

Table 2.2 Age and sex distribution of under fives covered in the survey.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>43</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>7-12</td>
<td>33</td>
<td>16</td>
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Proportion of population covered

The proportion of households covered was 5% (200/3903). The total population in the area was estimated to be 14,000 in the year 1989 (ISE 1989). The expected number of under fives in this population would be 14% (MOHFW 1990) of this figure i.e. 1960. Using this estimate, the proportion of under fives in the population covered during the survey was 16%.

2.4 Interviews with providers of health care

During the concluding two months of the study interviews were conducted with several health care providers in the area to ascertain beliefs and reported practices with regard to diarrhoea management (Appendix 4). The aim was to assess how far these practices were consistent with the national programme and with the expectations of the families. The aim was also to ascertain what the determinants of these inappropriate practices were; the lack of knowledge or lack of agreement with what the programme was saying. Also, what the similarities and dissimilarities in the understanding and causation of diarrhoea by mothers and practitioners were.

The health care providers in the area had already been identified during the pilot phase and on subsequent visits. On the visit to the practitioner the explanation given to him was that I had been following up children in some families in the area for several months and had found that one of the diseases children suffered from commonly was diarrhoea and therefore I wanted to know
more about the disorder and its management from a qualified person. If the 'doctor' was too busy attending to patients an appointment was fixed with him for the interview. On several occasions I waited and watched him treating patients and conducted the interview later when he was free.

**Techniques used during the study**

*Direct observation.*

*Conversations*: Informal talking with individuals or small groups.

*Interview*: Structured and unstructured questions were asked on predefined topics to individuals (respondents) and the answers recorded in detail.

*Group discussions*: Predefined topics discussed with groups of individuals.

*Secondary data*: Reports or other documents available on studies done in slums by other investigators.

*Tools of clinical medicine*: weighing scales, infantometers for measuring length and microtoise for height measurement.
Definitions used in the study

Community: For this study, ‘community’ was defined as the population living in the Janta Jeevan camp at Tigri.

Household: A group of people eating from a common kitchen.

Nuclear family: A nuclear family consisted of parents and their offspring.

Joint family: Comprised of households where in addition, a third generation such as grandparents or grand children or other relatives like siblings of one or both parents or their spouses or their children were living in the household.

Caste

High castes: The castes included under this group were Brahmins, Banias and Rajputs


Other castes: All others. In this area these mainly comprised of the ‘Other Backward Castes’ (OBCs). Muslims too, were included in this group.

Diarrhoea: Passage of three or more liquid (loose or watery) stools in a 24 hour period. For children aged less than 3 months the mothers definition of diarrhoea was used.
Persistent diarrhoea: Diarrhoea of duration ≥14 days.

Type of stools:
Loose: Liquid stools which have more stool and less water.
Watery: Liquid stools which have more water and little faecal matter and would take the shape of the container.
Formed: Formed or semifomed stool which has no separate water. It has its own shape.

Recovery: Passage of no liquid (loose or watery) stools in a 24 hour period for at least 48 continuous hours, the last day of this period being the day of recovery.

Pneumonia: Cough with respiratory rate >40 per minute (age 12-60 months), ≥50 per minute (age 3-11 months), ≥60 per minute (age 0-2 months) or cough with indrawing of lower chest or cough with respiratory rate > 40 per minute (≥ 50 per minute/ ≥ 60 per minute) and indrawing of lower chest.

Recovery from pneumonia:
Recovery from cough: the child has no cough in a 24 hour period for at least 48 continuous hours, the last day of this period being the day of recovery.
Recovery from respiratory rate >40/min (≥50/min, ≥60/min): This is the day the respiratory rate as counted by the field worker is 40 or less (49 or less for 3-11 month old children and 59 or less for
0-2 month old children) and this date will coincide with the date a visit is made.

Recovery from lower chest indrawing: recovery from lower chest indrawing is the day when no chest indrawing is observed. This date will also coincide with the date a visit is made.

Breast feeding status:
Non breast fed: not receiving breast milk at all.
Exclusive: only receiving breast milk with no other solids or liquids (including water).
Partial: receiving more than 2 breast feeds in 24 hours along with other foods or liquids.
Occasional: receiving 2 or less breast feeds in 24 hours along with other foods or liquids.

Consistency of foods:
Watery: clear liquid with no solid particles.
Gruel: cooked mixtures containing a cereal with milk, boiled water, pulses or vegetables.
Semi solid: mashed potato, mashed bread in milk, thick khichri, thick dalia etc.
Solid: banana, biscuits, roti.

Meal: A 'main meal' was defined as the number of times, a meal containing a cereal with another food item was consumed in a 24 hour period eg cereals with milk, cereals with tea, cereals with
pulses, cereals with vegetables and cereals with chutney or pickles. 'All meals' included in addition to the main meals eating of any snacks during the day.

Health seeking Behaviour: Comprised of all activities that people do individually and collectively, in order to maintain and/or return to health; the specific steps taken and the reasons for these.

Oral rehydration salts (ORS): Solution recommended by the WHO for correction of dehydration and maintenance of hydration in acute diarrhoea. It contains glucose (20 gm) and three salts - sodium chloride (3.5 gm), trisodium citrate/ dihydrate (2.9 gm) or sodium hydrogen carbonate (2.5 gm) and potassium chloride (1.5 gm) to be mixed in one litre of water. It also includes the ORS packets available commercially with varying compositions.

Sugar salt solution (SSS): A mixture of sugar (sucrose) and salt (sodium chloride) in amounts so as to provide a final concentration of 4% sugar and 0.4% salt to be used when ORS is not available.

Home available fluids (HAF): Increased amounts of easily available fluids in the home eg plain water, lemon water, tea, soups, dal water, rice water etc.
Analysis

Forms were designed in the computer and all analysis was done using the EPI INFO (Version 5.0) software from CDC, Atlanta, USA.

The social and economic determinants of malnutrition were analyzed at a household level in addition to the individual level. This approach avoided weightage to the same household variables more than once as is the case when all study children were considered. Alternatively, a single child, usually the youngest from each family could have been considered but the number of children available for a quantitative analysis by this approach was too small.