

ASSESSING NUTRITIONAL STATUS  
OF PRE-SCHOOL CHILDREN:  
SOME ORGANIZATIONAL  
CONSIDERATIONS

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INTRODUCTION

Child welfare is one of the most important aspects of social welfare. For a long time, social welfare was associated with services for persons suffering from physical or mental handicaps. While services for such handicapped persons will naturally continue to form a part of the total welfare programme, greater attention is now being paid to the various services needed by normal persons and more so by the children. It is recognized that the benefits of a healthy and happy childhood are numerous. An adequate level of nutrition and protection from health hazards are very important to a child in his development. However, it is found that a large number of normal children in India do not have adequate nutrition for one reason or another. We need not discuss these reasons here because such a discussion will lead us to the socio-economic, cultural and even political problems of society in general. Suffice it to say here that the need to provide nutritional supplements to a very large number of normal children has been recognized and that a number of such programmes are operating in the country. So far as child welfare services are concerned, the stress, during the Fifth Five Year Plan will be on providing integrated child care services. Nutrition programmes for pre-school children will form an important segment of such services.

When large-scale programmes of provid-

ing nutritional supplements to children whose initial nutritional status is poor are undertaken, the need arises to assess their nutritional status at different points of time. This need is felt not merely to make out a case for such programmes, (the case having been already made out), but mainly to evaluate the results of the programmes. It is found that when any large-scale programme of providing nutritional supplements is to be organized, it is easier to do so at places where children gather in fairly large numbers. Thus, it is found that schools are focal points for distributing nutritional supplements. Lack of suitable focal points for organizing the programme of distribution of nutritional supplements has been one of the reasons why such feeding programmes for pre-school children are not as many as they need to be. As the programmes of starting recreational centres, *balwadis*, pre-primary schools, etc. gather momentum, the programme of distribution of nutritional supplements will also receive fillip. But this raises several questions concerning delivery of services, nutritional or otherwise, to the home-bound pre-school children; the roles of special purpose, general welfare and child welfare agencies in such a delivery system; the need to resort to unconventional methods of reaching the pre-school children; etc. But obviously, this is not the place to enter into such a discussion.

Just as the nutrition programme needs to be on a large scale, the programme of

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assessing the nutritional status too will have to be on a large scale. It is obvious that such a large scale nutritional assessment will have to be at once comprehensive enough to be worthwhile and useful, and quick enough to be organizationally feasible. The present paper describes and discusses one such large-scale programme of Nutritional Assessment of pre-school children. The stress is more on the organizational problems involved. The Assessment under discussion was not connected with any programme of distribution of nutrition supplements but formed an important part of a research project. However, it can be relevant for nutrition programmes as well. Before taking up the details of the Assessment, we will briefly describe the main research project entitled "An Area Study of the Needs and Problems of Pre-school Children".

#### THE AREA STUDY

In view of the growing trend towards urbanization in India and of the grave problems that have followed in its wake, the need to study the special problems of urban children and youth was felt. It is now recognized that large sections of urban children are, socially speaking, as handicapped as are the rural children. But the nature and the impact of such handicaps are different and need to be understood. Studying the various aspects of the situation of urban children now forms a part of the research activity of the Tata Institute of Social Sciences. The Institute had, in 1969, set up a Unit for Study of the Urban Child and Youth with financial assistance from the UNICEF. One of the studies undertaken by the Unit so far is an Area Study of the Needs and Problems of Pre-school Children. It was sponsored jointly by the Indian Council for Social Science Research and the UNICEF and was carried out in 1971

in two wards of Greater Bombay. One was a ward (G/south) from Bombay City and the other (L) was from the Suburbs. Both are predominantly industrial in nature. The objectives of the Area Study can be summarized as follows:

- (1) To obtain information on various factors e.g. demographic and socio-economic characteristics and physical environment; nutritional level of pre-school children and the parents' understanding of the needs and problems of their pre-school children.
- (2) To suggest guidelines for formulating a minimum programme of integrated services for pre-school children in urban areas.
- (3) To study the existing institutional frame-work for child welfare in the selected areas.

According to the research plan, 2,000 households were contacted for the necessary information. Finally, 1,908 households furnished the data. In all, 3,499 children in the age-group 0-6 years were covered by the Main Study. It collected extensive data about pre-school children and their parents in the sample households. The Area Study had a few sub-projects attached to the Main Study of the Sample Households. They are mentioned below without any details.

1. Views of the community influentials concerning the services for pre-school children.
2. Follow-up study of the utilization of welfare services for pre-school children.
3. Nutritional Assessment of pre-school children.
4. Welfare Agencies — Their work and potentialities.
5. A study of the existing institutional frame-work for child welfare in the selected areas.

## THE NUTRITIONAL ASSESSMENT

The Nutritional Assessment was undertaken to fulfil one of the objectives of the overall Area Study. All the pre-school children aged 1-6 years in the sample households were to be covered by the Assessment. The data collected for the Main Study were to be used for analyzing data on the health and nutritional status of the pre-school children. The objectives of the Assessment were as follows :

1. To assess the nutritional status of the children by employing a technique which would be simple, objective, replicable and easily learned. It was expected to be useful in comparative studies also.
2. To relate the anthropometric measurements of the selected children regarding height, weight, head and chest circumferences, etc. to the expected measurements and to use these in assessing the nutritional status of the selected children.
3. To relate the nutritional status of the children to their socio-economic background by using the data already collected through the Main Study.
4. To conduct a diet survey.
5. To evaluate the following measurements as indices of nutritional status:
  - i) Arm length,
  - ii) Arm circumference, and
  - iii) Calf circumference; and
6. To obtain statistics on protein-calorie malnutrition, vitamin A and riboflavin deficiencies, anaemia and rickets.

## MAJOR COMPONENTS OF THE ASSESSMENT

The major components of the Nutritional Assessment were based on the objectives set out for it. They were.

1. Application of the Quac Stick method in assessing the nutritional status of Pre-school children.
2. The assessment of different types of nutritional deficiencies and those leading to serious physical conditions.
3. The measurement of actual anthropometric characteristics and expressing them as percentages of the expected measurements.
4. Conducting haemoglobin test and stool examination and collection of data on the dietetic intake of the selected children, and
5. Linking the Nutritional Assessment to the Main Study by utilizing the latter's socio-economic data about the households and the parents, and the special information about the children.

## THE QUAC STICK\*

There are various methods for assessing nutritional status of children. As the Area Study was concerned with pre-school children, the Nutrition Sub-committee of the Indian Academy of Paediatrics decided to test a newly developed method of assessing the nutritional status of pre-school children. This is the Quac Stick. As this method was yet too new and subject to confirmation, it was also necessary to take the different anthropometric measurements and to conduct clinical examinations and tests.

The method of Quac Stick (*Quaker Arm Circumference Stick*) was developed for a

\* For details of the Quac Stick Method refer to "Quac Stick — Field Measure for Quick Assessment of Nutritional Status of Pre-school Children" by Amdekar, Rajadhyaksha, Desai and Shah in *Indian Paediatrics* volume IX, Number 7, July 1972.

quick nutritional assessment of pre-school children in Eastern Nigeria in 1968-69 by the Quaker Relief Team. As a result of the military operations, the Nigerian children suffered from frequent and severe malnutrition and the relief agencies needed an indicator which could be used to guide their programme of distribution of nutritional supplements. They were on the look-out for a simple technique which was both objective and reliable and which could, at the same time be learnt easily. With the help of such an indicator they wanted to compare one area with another and the same area at different points of time. They also wanted to determine the quantity of nutritional supplements needed by individual children and to gauge the ultimate success of their programme. The handicap under which they worked was that a large number of the Nigerians were unable to give the exact ages of the children.

The result of their search was the Quac Stick. They found that the relationship between the arm circumference (which depends upon the body tissues) and height is a good indicator of a child's nutritional status. The maximum left arm circumference is measured when the arm is kept hanging by the side of the trunk. The other measurement that is required is height. This method is applicable to children who are over 12 months but not more than 72 months. So long as they are within this range it is not necessary to know their exact ages.

On the basis of the readings on the Quac Stick, the children were grouped in four categories. In the case of the Nigerian children, the Quaker Relief Team adopted the following categories.

1. Children whose arm circumference was over 85 per cent of the expected arm circumference for their heights,
2. Children whose arm circumference was between 80 and 85 per cent,
3. Children whose arm circumference was between 75 and 80 per cent, and
4. Children whose arm circumference was below 75 per cent.

Since the question was one of priorities and the food supplements had to be given to those who needed them most, children in the last two categories were given food supplements. Children whose arm circumference was less than 75 per cent of the expected arm circumference for their heights were given proportionately more food supplements so that they could make quick progress. Children received food supplements so long as they remained in the last two categories. It also meant that such supplements were withheld from those who made progress and crossed over to the first two categories.

It is possible to have only two broad groups of children, viz. those whose arm circumference is 80 per cent or more of the expected arm circumference for their heights and those who are below this level. The latter constitute the high-risk group and receive food supplements while the former can be expected to make do with whatever they get as a matter of routine. This is based on the general observation by doctors that children in former category do not need any special attention for their physical development.

The Nutrition Sub-committee of the Indian Academy of Paediatric and the Institute of Child Health at the J. J. Group of Hospitals, Bombay are standardizing the Quac Stick for Indian children. So far, two nutrition surveys have been conducted. One of them was the Nutrition Assessment of pre-school Children conducted as a part of the Area Study described here. The other was conducted in Palghar in Maharashtra and covered about 600 rural children.

The paediatricians in charge of these surveys compared the results obtained with

the help of the Nigerian Quac Stick to the results (for the same children) obtained on the basis of weights. This was done because the actual weight of a child expressed as a percentage of the weight he is expected to have for his age (as per Harvard Standard) is considered to be the best indicator of his nutritional status. When such a comparison was made, it was observed that Indian children showed higher readings on the Nigerian Quac Stick. This was true of the urban as well as the rural children in all the age-groups. The comparison indicated that it was necessary to modify the Nigerian Quac Stick if the method was to be used in the case of Indian children. This has now been done by Dr. P. M. Shah and his colleagues. The Indian Quac Stick is ready but more research is needed in other parts of India to make it standard. The objective in developing the Quac Stick is that the results obtained through it should have a high and direct correlation with the results obtained on the basis of the weights.

On the basis of the Indian Quac Stick the pre-school children are grouped in the following categories:

1. Those whose arm circumference is 81 per cent or more of the expected arm circumference for their heights,
2. Those whose arm circumference is between 71 and 80 per cent,
3. Those whose arm circumference is between 51 and 60 per cent, and
5. Those whose arm circumference is 50 per cent or less.

These categories have been adopted in view of the very large number of malnourished children in India.

Children whose arm circumference is 81 per cent or more of their expected arm circumference for their heights may not be covered by the programme of the nutritional supplements. All those who are below this

level will need special attention if their physical development is to be speeded with the help of nutritional supplements to their routine intake of food. Although different gradations of nutritional status have been provided for in the Indian Quac Stick, it is possible, for the sake of a large-sale programme of distribution of nutritional supplements, to have only two broad groups of children, viz. those who need supplements and those who don't.

At present, such programmes are operated on a very gross level: the quantum and composition of the supplements are the same for all the children covered. The variations, if any, are very few. As such, having two broad groups of children is all that would be required.

#### ORGANIZATION OF THE ASSESSMENT

The Nutritional Assessment was organized by the Unit for Study of the Urban Child and Youth which devotes itself to a study of the social problems of children. As conducting a nutritional assessment is a specialized job it was imperative for the Unit to seek expert help, guidance and collaboration. The Indian Academy of Paediatrics was approached for such collaboration. At the request of the Academy, Dr. P. M. Shah Convener of the Academy's Nutrition Subcommittee, took up the responsibility for conducting the Nutritional Assessment of the children covered by the Main Study.

The Assessment thus was a collaborative effort of the Unit and the Indian Academy of Paediatrics. The latter carried the responsibility for all the technical work and for the medical examination of the children. The schedule used for recording the data was constructed by the Nutrition Sub-committee. The Unit was in charge of organizing the Assessment, preparing the codebook and the scheme of analysis, and data processing. It was agreed that while the doctors engaged

in the assessment would write technical reports, the Unit would analyze the Nutritional Assessment data in the light of the socio-economic data obtained through the Main Study. Thus writing papers, reports, etc. on Components 1 to 4 would be done by the doctors who had participated in the Assessment.

The main organizational objectives kept in mind while conducting the assessment were as follows:

1. To get a good response. As the Main Study and the Assessment were carried out at two different points of time so far as each sample household was concerned, it was necessary to ensure that a maximum number of children covered under the Main Study attended Nutritional Assessment.
2. To ensure a smooth and regular work-flow at the time of the actual Assessment, especially because a child had to go from person to person before all the necessary technical data about him could be obtained. It may be mentioned here that a team of doctors and technicians was required to gather the requisite information through various measurements and tests.

We will now describe how these objectives were sought to be achieved and how the task was approached. In the process, we will discuss the various aspects of organising the Nutritional Assessment. These are:

- a) Selecting the centre
- b) Informing the parents
- c) Organizing the work-flow
- d) Personnel
- e) Conveyance
- f) Cost

#### A — SELECTING THE CENTRES

As the Nutritional Assessment was linked to a field research project, it was necessary to carry out the work in the field. Similarly, as the geographical coverage of the Main Study was fairly extensive, the Assessment had to be conducted at different centres. For determining the number and the location of centres, it was necessary to take into consideration:

- i) the distance to be covered by the parents for bringing the children to the centres,
- ii) the number of children to be examined and the number of children one team can examine in about 3-4 hours, and
- iii) the availability of suitable premises to serve as a centre.

When the number of children to be examined at a centre is small and yet it is necessary to have a separate centre, it is possible to arrange assessments at two different centres by one team on the same day but at two different points of time. Necessary transport would, of course, be needed.

It was but natural that the parents were unwilling to spend more than 5-6 minutes to go to a centre. Spending time is like spending money and requires careful consideration. To describe the local situation in the two selected areas, it was found that the time the parents found most convenient for attending the assessment was between 9 in the morning and 12 noon, especially because the Assessment was conducted only on Sundays to suit the convenience of the doctors who worked in an honorary capacity. The Sundays suited most of the parents as well. The average number of children who could be examined in an hour was between 50 and 60. This average number depended on a number of factors

such as the physical layout of the centre, the smoothness of the work-flow, the composition and the strength of the assessment team, etc. Taking into consideration all these points, it was decided to conduct the Assessment at 12 centres so far as the Area Study was concerned.

The total number of children examined at these 12 centres was 2,056. Of these, about 150 had come uninvited but were examined just the same. Of the remaining, 1,576 were definitely those for whom detailed information was available in the Main Study. Some 330 were doubtful cases. On account of the inadequate information supplied by the adults (other than parents) accompanying these children, we could not be sure that they had been covered by the Main Study. As such, they were not considered for the final analysis. This problem may not arise when nutritional assessment is not linked to a research study, as ours was. But one can foresee such a problem and take adequate steps to meet it. Probably, the problem is such that it cannot be solved completely, but efforts can be made to keep it to the minimum.

Once it was decided to have a centre in a locality, it was necessary to look for some agency the premises of which could be used for the Assessment. A centrally located agency was preferred. Another consideration in the choice of the agency, apart from the willingness of the agency to allow the use of its premises, was the total space and the facilities available. An idea of the physical layout and area found most useful and convenient, is given at a later stage.

When it was not possible to have a centre within easy reach of the sample households response was improved by providing transport to those who lived some distance away from the centres. This was particularly true in the case of mothers with very young children. We also found from our

pre-Assessment canvassing that even in a city where multi-storeyed buildings are so very common, mothers with young children did not like centres situated on even the second or the third floor. So, efforts were made to select agencies which could provide space on the ground floor. This was just as well because in the congested areas in which these disadvantaged households lived, a ground floor, along with the adjacent space, roads, grounds, etc. provided greater scope for a possible spillover of men, women and children. The types of agencies which were able to provide their premises were schools, community welfare centres, hospitals, etc. The average number of children per centre was around 250. In a couple of cases as many as 350-400 children came to one centre. As the children were accompanied by their elders, the available space had to be sufficiently big. When the number of children to be examined at one centre was large, two teams of doctors and helpers worked simultaneously provided the centre was big enough.

A description of the work-flow is given a little later. For a smooth work-flow involving a very large number of people, ample space is needed. We found that having a big hall with two or more doors, some open space or varandahs outside the hall and a room, even if small, adjoining the hall, was desirable. The hall would be the place where the greater part of the overall work could be done. The open space or varandahs outside the hall could be used for forming the queue, and for checking and registering the children. In some cases, the collection of the completed schedules could also be done in this space. A separate room adjoining the hall is found useful for collecting and examining the blood and stool samples. The sight of the equipment needed for this purpose as well as the behavioural response of the children subjected to these tests, has an adverse effect

on the general morale of other children. It is, therefore, desirable to have a separate room for these tests. Should a separate room be not available, it would be advisable to curtain off a corner of the hall for this purpose.

It goes without saying that a centre should have drinking water and sanitary facilities. The task of conducting the Assessment is facilitated, to a considerable extent, if the centre itself can provide the requisite furniture. As the model pattern for the work-flow had been planned and worked out by the Nutrition Sub-Committee, it was possible for us to let the centre have an idea of the different pieces of furniture required. For this purpose again, the overall work-flow was taken into consideration. The general requirement was for the following.

*Four tables:* One each for registration, for examination by the paediatricians, for examining the blood samples, and for collecting the schedules.

*Six chairs:* For those taking and recording the various measurements.

*One bench:* For the blood test.

*A couple of stools:* For keeping the small weighing machines.

It is, of course, always possible to make improvised arrangements. Where the centres themselves are unable to make the necessary provisions, the organizers can hire furniture for the occasion.

The organizers should, it is almost superfluous to add, take out all the necessary formal permissions well in advance of the date fixed for conducting the Assessment. It is our experience that the officials in the government and municipal departments and in the voluntary agencies are generally most helpful in giving not only the necessary formal permissions but also active help. The organizers should, however, give them sufficient time for this purpose.

## B — INFORMING THE PARENTS

It has already been mentioned that the Nutritional Assessment was a sub-project attached to the Main Study and that the children to be assessed belonged to the households constituting the sample for the Main Study. This meant that only selected households were to be informed about the Assessment and about what they were expected to do. Even if such an Assessment is not linked to a field research project, informing the parents would be a task by itself because of the content of information and the need to motivate them to attend the Assessment. If the coverage of Assessment is not community-wise, it will be necessary, as was the case with our Assessment, to inform each selected household individually. This task was assigned to the interviewers who had collected the data for the Main Study, because they could easily locate the households even after a lapse of time. Depending upon the time-lag between the Main Study and the Assessment, information about the Assessment was given at the time of the interviews for the Main Study or a few days before the Assessment. It was our experience, however, that even when such time-lag was short, household's response to the request to attend the Assessment improved if they were contacted again on the day of the Assessment.

Conveying this new-fangled idea of the assessment of the nutritional status of children to their parents is some task indeed. In the first instance, the notion of having an apparently healthy child examined by a doctor, let alone a team of several doctors, is foreign to most of the parents. To have them examined, moreover, for purposes of the doctor's and social investigator's profit — albeit profit knowledge-wise — did not make much sense to many. That the results of the Assessment could lead to the formulation of some pro-

gramme of nutritional supplements for disadvantaged children in general but not necessarily for their own children, seemed a remote possibility and failed to enthuse them. We ourselves made no such promises. Some parents were scared when they came to know that a blood test was planned. We also found that some persons tended to view the Assessment as a show of charity. Now, there are people, even amongst the socially disadvantaged sections, who resent the idea of charity being extended to them. On the other hand, there are also those who not only "welcome it but demand it. Considered this way, an Assessment linked to a research project is at a disadvantage as compared to an Assessment linked to a feeding programme. A great deal naturally depended upon the individual entrusted with the task of contacting the parents. The degree of response at any one centre was a measure of his or her persuasiveness.

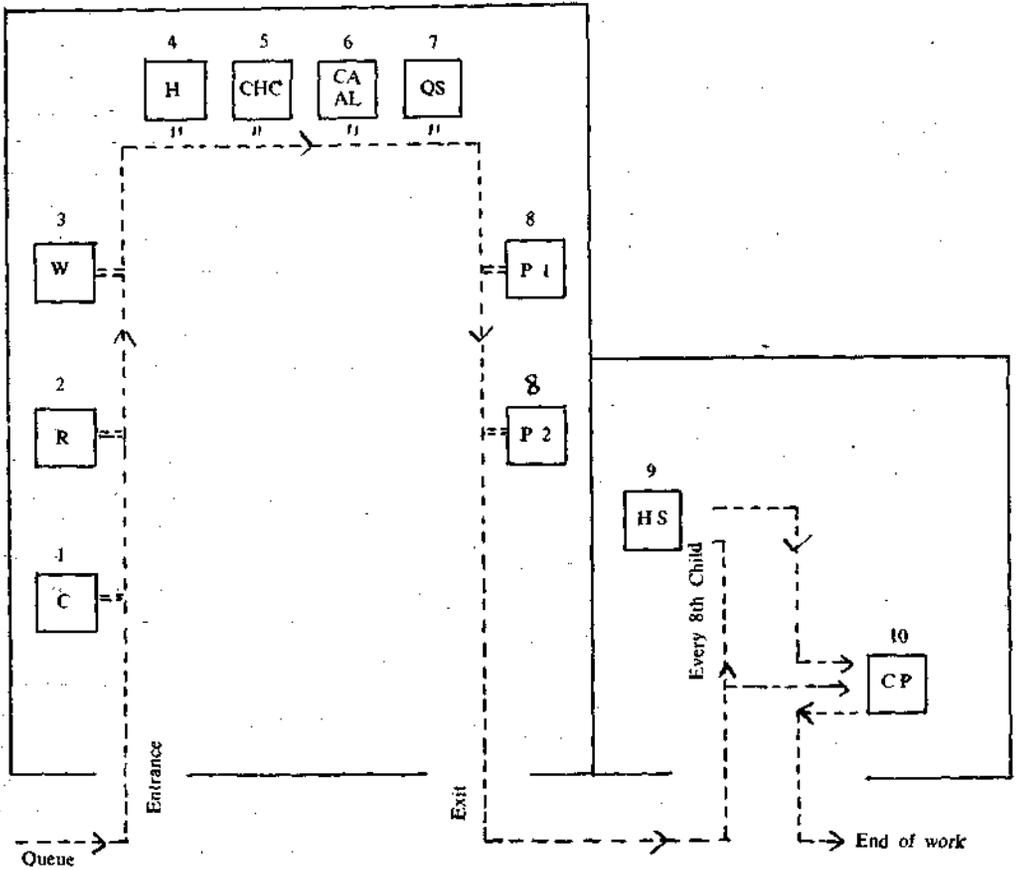
Persuading the parents to bring their children to the selected centres for the Nutritional Assessment soon acquired many of the characteristics of a small campaign! And one now knows that the golden key to success in such ventures is involving the local leaders and entrusting part of the job to them. Here, we came across different problems. In the two selected wards where our Area Study was conducted there were some distinct localities which had some of the characteristics of a neighbourhood or a community. There also existed, however, some localities which shared the general urban heterogeneity and anonymity. Depending upon the situation, identifying the local leaders was either an easy or a difficult job.

After the preliminaries of trying to persuade the parents were taken care of, there remained the task of ensuring that they got the various particulars right — the name of the centre, its exact location, the day,

date and the time, etc. To ensure that older children did not come — the technique used for assessing the pre-school children is unsuitable for older children — we had to tell the parents which of their children were to be brought to the centre. For this purpose, we had to identify the children by name. The children were those about whom we had collected detailed information during the course of our Main Study. Organizationally, it meant preparing lists of parents to be informed and of children to be assessed. These lists were prepared separately for each centre and were so arranged that sub-area-wise parts of the lists could be given to individual investigators. These lists proved very useful not only for contacting the parents but also for registering the children and for monitoring the progress of work. Identification of households from where children had not attended the Assessment was easy and while the work was in progress, the investigators could once again go round the locality making a last-minute bid to persuade the parents to come along with their children. Preparing such lists was easy as all the relevant particulars were available from the Main Study. Only, when the time-lag between the interviewing for the Main Study and the Assessment was short, we had to work under pressure to beat the clock.

A field programme of nutritional assessment and medical examination of children cannot, even though undertaken for purposes of research, be entirely devoid of the element of service. So, the parents were given to understand that they could have their ailing young children examined by the paediatricians in the team. For minor ailments, supplies of medicines to last 2-3 days were distributed on the spot. Although an effort was made to restrict the Assessment to pre-school children covered by the Main Study, it was inevitable that some older children and some pre-school

Chart showing the work — flow



- |    |       |  |
|----|-------|--|
| 1  | C     | Checking   |
| 2  | R     | Registration                                       |
| 3  | W     | Measurement of Weight                              |
| 4  | H     | Measurement of Height                              |
| 5  | CHC   | Measurement of Circumferences of head and chest    |
| 6  | CAAL  | Measurement of Circumference of Arm and Arm Length |
| 7  | QS    | Reading on Quac Stick                              |
| 8  | P1 P2 | Examination by two paediatricians and diet survey  |
| 9  | HS    | Haemoglobin test and Stool examination             |
| 10 | CP    | Collection of papers                               |

children not covered by the Main Study would troop in. They were examined in order to maintain good public relations, but their data have not been included in the analysis.

For the purpose of the Assessment, it was necessary to record the correct ages of the children. So, when the parents were contacted they were requested to be ready with this information. Whenever possible, they were asked to consult birth certificates, horoscopes, hospital cards, etc. As an aid to determining the ages as nearly exact as possible, the Nutrition Sub-Committee had devised a Local Events calendar where a large number of major and minor Hindu, Muslim and Christian festivals and days of religious, cultural and social significance were recorded and their equivalents in the Gregorian Calendar were identified for the preceding five years — five years because the Quac Stick Method is applicable in the age-group 1-6 years. This Calendar was used when the parents gave the date of birth according to, say, the Hindu Calendar or with reference to some special day or event. After identifying the year of birth, it was possible, with the help of the Local Events Calendar, to place the child's date of birth as near to the exact date as possible. Such a Calendar is, really speaking, a Special Events Calendar and had to be prepared well in advance of the Assessment with the help of old calendars, *panchang*, etc. The parents were requested to take the children to the centres themselves as they but not others, could be expected to furnish the necessary information required by the doctor's team. One more practical aspect could be mentioned. Most of the young children are not inclined to view the prospect of a medical examination with equanimity. It is in the interest of the organizers if the parents concerned could be present to take the situation in hand by pacifying their crying babies! On our part,

we offered biscuits or toffees to the children to secure their co-operation.

#### C — ORGANIZING THE WORK-FLOW

The major part of the Assessment was devoted to the various anthropometric measurements and the medical examination of the children. Systematic organization of the flow of work was of vital importance as the number of children to be examined was large and as the work had to be completed quickly. Recording the data was to be done simultaneously. The work-flow was taken into consideration while finalizing the sequence of the items included in the schedule. We now detail below the sequence of the different jobs that were done. This sequence is from the point of view of the child being examined. Each job was the special responsibility of one or two persons.

##### *Job 1: Checking the children*

The investigators had previously guided the parents and the children covered by the Main Study to the Centre. An effort was made here to check once again that, as far as possible, only those pre-school children who had been covered by the Main Study, were present. Simultaneously with the checking, the children and their parents were lined up in a queue.

##### *Job 2: Registering the children*

The children were registered for the Assessment. Identification data for the centre and for the child were recorded here. The schedule was then handed to the adult accompanying the child. Persons performing the different jobs had to make the necessary entries in the schedule and hand it back to the clients.

*Job 3: Recording the weight*

*Job 4: Recording the height*

*Job 5: Recording the circumference of the head and the chest*

*Job 6: Recording the circumference of the arm and the calf*

*Job 7: Recording the reading on the Quac Stick*

*Job 8: Clinical Assessment of Nutritional status by the paediatrician*

The child was examined thoroughly at this stage. Recommendations for X-Ray were made, if found necessary.

*Job 9: Blood and Stool examination*

Every eighth child was sent in for this purpose.

*Job 10: Diet Survey*

Every sixteenth child was sent in for this purpose.

*Job 11: Collection of papers*

The filled-in schedule was collected after a child had gone through all the stages of the overall work. The person collecting these schedules would make sure that no items of data were missing. If they were, the child was sent to the appropriate person to have the requisite data recorded in the schedule.

The children would move in single file and go from one doctor to another. The pace of the overall work-flow was decided, in most of the cases, by the time taken by

the paediatricians to examine the children. The persons over-viewing the queue had to regulate the work-flow considering the paediatrician's work. As the job of medical examination naturally requires more time than other jobs, it is desirable to have two paediatricians in one team. A diagrammatic representation of the work-flow is given on page 20.

#### D — PERSONNEL

Closely linked to the question of organizing a smooth work-flow is the strength of personnel required for it. When a large number of pre-school children, who cannot come to a centre unattended, are to be examined in a reasonably short time, it is necessary to have a sufficiently large team to accomplish the task. While it was true that doctors were to perform the essential jobs involved in the Nutritional Assessment including medical examination, it was equally necessary to give them adequate support in recording the data, organizing the overall work and regulating the work-flow. The following statement gives an idea of the type and number of persons who took part in the Assessment organized by the Unit.

Among the technical personnel, all except the laboratory technicians who collected and examined the blood and stool samples, were highly qualified doctors. It may be mentioned that all the doctors and the laboratory technician worked without compensation. Practically all the doctors had an academic interest in the work and were to analyze the data to bring out technical papers as envisaged by the objectives of the Assessment.

The supporting personnel was provided by the Unit. The officers of the Unit and a couple of volunteers worked without com-

Job	Personnel	
	Technical	Supporting
Informing the parents	—	3-4
Checking	—	1-2
Registration	—	1
Measurement of weight	1	1
Measurement of height	1	1
Measurement of the circumferences of head and chest	1	1
Measurement of circumferences of calf, arm and arm-length	1	1
Reading on Quac-Stick	1	1
Clinical assessment of nutritional status by the paediatrician and diet survey	2	—
Haemoglobin and stool examination	1	—
Guiding the queue	—	1-2
Collection of papers	—	1
General Assistance	—	1

pensation. But temporary staff including interviewers, coders, etc. were compensated for the work they did for the Assessment. The work of Assessment was done by the paediatricians and their team. Taking care of the preliminaries, recording the measurements, providing general assistance and doing incidental jobs were assigned to the supporting personnel. While selecting a person for a specific job, the nature of the job and the person's familiarity with it were taken into consideration. For example, the investigators for the Main Study were sent out to establish contacts with the parents. The work of checking the names of the children was given to the person who had compiled the lists of parents and children and was thus familiar with the lists.

Although a large number of doctors had offered their voluntary services for the present Assessment, a question arises: What could be the composition of the overall team in terms of the necessary qualifications for the different jobs? When the different jobs are reviewed with this consideration

in mind, it is seen that depending upon the number of children to be examined, having one or two paediatricians to conduct the clinical examination is most essential. Similarly, a laboratory technician to collect and examine samples of blood and stool will also be needed. But for other jobs, it is not necessary to have highly qualified doctors, unless of course, their voluntary services are available. Less qualified medical or para-medical staff could be engaged. It would, however, be necessary to give them due instructions for taking the necessary measurements, especially those concerning the exact locations for measurements. The use of fibreglass tapes to take the measurements would facilitate this work as these tapes are inelastic and therefore suitable for taking accurate measurements. The point made here is that equipment would render the task of giving orientation to the persons concerned, easier. Appropriate instructions would again be necessary if the persons in charge of recording the readings on the Quac Stick are not familiar with this technique. This would be true of doctors as well as the less qualified persons.

To ensure a smooth work-flow, it is suggested that the whole team should be assembled well in advance of the assessment and a couple of dummy work sessions — dry rehearsals, in other words — could be held so that everybody knows what to do at what time. The jobs to be done are easy and what needs to be ensured is proper co-ordination.

#### E — CONVEYANCE

While discussing the questions concerning the selection of the centre, it was mentioned that one of the considerations should be its easy accessibility to those who would be called upon to come to it. We pointed out that when such easy accessibility could not be ensured, we provided transport to the people both ways. It helped in increasing the response to the Assessment.

Similar support also helps in assembling a large team for concerted work. Necessary transport arrangements are also required for carrying the equipment to the various centres in the field.

It was pointed out that the paediatricians sometimes indicated X-Rays for some of the children. In such cases it is better to transport such children and their parents to the Hospital where X-Ray can be taken and thereafter back to their localities. It was our experience that a part of the organizational success of our venture can be attributed to the fact that both the Unit and the Nutrition Sub-committee had good transport facilities at their disposal. The utility of such transport in a big city like Bombay cannot be underestimated.

#### F — COST

The items of expenditure for conducting the Nutritional Assessment described here were as follows :

(1) Token payment to the Indian Academy

of Paediatrics which had agreed to conduct the Assessment. The sum paid was Rs. 2,000. As mentioned earlier, all the doctors who worked for the Assessment did so without any compensation. That was the reason why they worked only on Sundays.

(2) Transport

(a) for visiting the various centres prior to the Assessment for selecting the centres.

(b) for bringing some of the children and their escorts on the days of Assessment and reaching them home, and

(c) for the staff on the days of the Assessment.

(3) Compensation to the service staff of the co-operating agencies which had made their premises available to serve as centres for the Assessment.

(4) Payment to the temporary staff engaged by the Unit for informing the parents.

(5) Payments to the temporary staff engaged by the Unit for help in conducting the Assessment.

(6) Refreshments.

(7) Printing the schedule.

(8) Contingencies.

The total cost of conducting the Assessment at 12 centres, came to Rs. 4,918. The total number of children whose data were taken for final analysis was 1,576. Thus the cost per child came to Rs. 3.15.

While we give the cost of conducting the Assessment described here, the point can be made that these costs would very much

depend on the local conditions. The different types of personnel available, the rates of payment, costs of transport, etc. are all local factors and will differ from place to place.

In this article, we have discussed some of the important aspects of organizing a large-scale nutritional assessment of pre-school

children. Such assessment will be necessary if large-scale programmes of distribution of nutritional supplements have to be organized as well as evaluated. The discussion is based on the experience gained through conducting such an assessment in Greater Bombay in 1971.