EVALUATION OF THE UNICEF
PROGRAMME IN THE
ESTATE SECTOR

Prepared by the
Macro-Economics Studies Division

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Abstract

The primary objective was as far as possible to assess the impact of UNICEF assisted programmes carried out in the plantation sector in the period 1979-1983.

These services involved the following areas:–

1. Creche
   (a) Physical upgrading of buildings.
   (b) Provision of safe water.
   (c) Provision of latrines and cooking facilities.
   (d) Provision of basic toys and play materials.
   (e) Aiding the training of creche attendants.

   The creche was to be developed into a community centre to maximise parental participation.

2. MCH Services
   (a) Establishing a cold chain of vaccines in key estates to cover target diseases of the National EPI.
   (b) Assisting in training Estate Medical Assistants to administer the vaccines.
   (c) Assisting in a programme of health education through Estate Medical Assistants, Estate Midwives, Family Welfare Supervisors and creche attendants covering –
       1) immunisation services;
       2) personal hygiene;
3) basic nutrition;
4) Family planning;
5) ante-natal care.

3. Water and Sanitation
(a) Assisting 20 plantations covering 300 schemes of water supply.
(b) Providing water-seal latrines - one per family.

4. Community Participation
Obtaining parents help in -
(a) feeding programmes in creches;
(b) cutting latrine pits;
(c) construction of wells (for drinking water).

5. Training
Assisting in training estate health welfare staff in -
(a) feeding of infants and young children;
(b) prevention and early treatment of diarrhoea using simple home remedies;
(c) stressing the importance of breast-feeding of infants.

6. Regional Training Centres
Provision of equipment and facilities for in-service training of health welfare staff at regional centres.

The inputs selected - though not a complete package, there being other areas outside the programme which are equally relevant - were however crucial to the objectives in the programme.
A complete impact analysis could not be carried out owing, on the one hand, to the programme being in varied stages of implementation and, on the other, to the absence of a base-line scenario. Some indicators of impact, together with trends and changes indicative of impact were evident from data pieced together from different sources in the estates.

The creche programme where it was successfully carried out was particularly effective, not alone in providing child care and basic education but also as a tool for attacking malnutrition among infants and children and for providing basic pre-school activity. It extended its influence further afield by providing a focus for community activity. The ripples of the message of basic health nutrition, infant care and the value of formal education spread through the creche to the mothers and the community of workers who are normally difficult to reach in any other way. Regular and consistent feeding of milk and supplementary foods could be a draw to the greater utilisation of the creche. The low utilisation of the creche, however, pointed to gaps in the scheme which merit the attention of future programmes to use this tool with its multi-faceted impact on the community.

The immunisation programme has been successful in minimising the incidence of a range of serious and, at times fatal, illnesses in young children, in the plantations where the coverage has been good. Here again the implementation has depended greatly on the effectiveness and availability of the Estate Medical Practitioner, in utilising the supplies of vaccines made available through the successful operation of the cold chain in key estates.

Health education had been fairly successful in conveying the message of immunisation and family planning
and to a lesser extent on nutrition, cleanliness and environmental hygiene. The message of family planning was, however, ineffective in that no methods except sterilisation and vasectomy were available in the plantations. Gaps in health education were evident in the collection of even pure drinking water in contaminated vessels, and the gross misuse of toilets, rendering these unusable in some estates which had been provided with toilets.

The training of medical and health personnel in particular was found to be very specific, and although very relevant and useful was not of sufficient depth and coverage. The problem was compounded by the fact that with only a narrow field of knowledge, such as immunisation or family planning, they were often expected to provide health and medical care in the absence of medically qualified persons in the estates.

Some health workers felt that even in these narrow fields of knowledge they were capable of meeting demand only 'partly' or 'rarely', implying either lack of time or facilities or sufficient knowledge.

Initial training which provided a good foundation should, it is felt, be continued in the next programme.

Water and sanitation had been provided only in a few estates, and these were well utilised. There was a great need for expanding these services for the use of toilets depended very much on the availability of water from sources which did not perhaps meet the ideal but could be used fairly safely, with a concerted programme of propaganda on the use of boiled water for drinking. Wherever the package of inputs completely or partially was well implemented, there appeared to be a substantial reduction in immunisable and diarrhoeal diseases, maternal
and infant malnutrition, infant and maternal deaths. There were, however, situations where good monitoring and recording had succeeded in identifying the malnourished, so that records showed an increase in the proportion of malnourished. This pointed to another vital factor, that of providing training for accurate, uniform and simple record-keeping methods in all estates.

Increase in worker participation in the creche programme in particular was another aspect seen in estates where the health inputs were fairly successfully implemented.

The raising of an awareness of the need for better facilities for women and children, in the management, the male workers and the females themselves was one single factor of great importance, since these two categories had traditionally received very low priority in a group where the male focus was predominant.

This awareness was totally lacking in the control estate where no inputs were even planned for. There was a complete absence of records and a sense of apathy in the responses given to questions by the male and female workers and even the management, displaying effectively, if negatively, the scenario which could very well have prevailed to a greater or lesser degree in other estates as well in the absence of intervention.
An Overview of the Programme

Introduction

The primary concerns of the UNICEF assisted project on estates were the health and welfare conditions of children and by extension their mothers. The areas identified for focus were the Day Care Programmes for children, maternal and child health services, upgrading of water and sanitation on selected plantations, primary education and community participation.

The project area covers the State owned tea, rubber and coconut plantations under the management of the Sri Lanka State Plantations Corporation and the Janatha Estate Development Board spread over 17 administrative plantation regions. The labour population living on the tea and rubber plantations consists mainly of Tamils of South Indian origin and more than 50% of the workforce are women. There are approximately 300,000 mothers and 500,000 infants and children (0-14 years) living in and around these plantations.

Day Care Services for Children

The importance of the children's creches arises from the fact that both parents in the workers' families are out working most of the day; mothers picking tea and fathers working in factories or other sundry work on the estates. Children are, therefore, frequently neglected or looked after by older siblings and, therefore, cannot attend school. It was evident that the physical upgrading of the creches that commenced in 1976-77 had some positive results and there was a need to upgrade a further 300 creches during the project period. This meant the physical upgrading of creche buildings including the provision of safe water,
latrines and cooking facilities; the provision of basic toys and play materials and the recruitment of educated young women from the estate community to train them as creche attendants. The upgraded creche was to be developed into a community centre in order to maximise parental participation so as to improve the quality of life of their children.

**Maternal and Child Health Services**

Some of the larger plantations have had some infrastructure for the delivery of health services to those living on the estates. These have hospitals, dispensaries and maternity wards maintained by Estate Medical Assistants (Para Medical Staff). One of the main objectives during this period was to establish a Cold Chain and to implement a Programme of Immunisation on the plantations to cover the same target diseases of the National EPI, namely, tuberculosis, diphtheria, pertussis tetanus (including neo-natal tetanus) and poliomyelitis. The programme was to cover 15 of the 17 plantation regions and was to be implemented under three phases, each phase covering five plantation regions. The two low country plantation regions in the coconut belt were left out since the resident labour on these plantations were minimal and the national programme would cover this population.

The programme was to be developed for the EMAs on the estates to administer the vaccines to their resident population. For this purpose the EMAs had to receive a training both in the theory and practice of immunisation. Key estates had to be identified with basic facilities so that they could service 6 to 8 satellite estates around them. Vaccine centres were to be established at each regional office to store the vaccines for estates in a
region. A key estate and its satellite estates would form a Plantation Area. UNICEF would provide all medical supplies including vaccines and equipment, Cold Chain equipment, and transport for the immunisation programme. Thereafter, the management and administration of the programme was the full responsibility of the staff in the estate agencies. The anticipated coverage following implementation was to immunise 80% of infants living on the estates with DCC, DPT and OPV on the recommended schedule within the first year of life (0-12 months) and to immunise 70% of the pregnant women with tetanus toxide.

Health Education

Along with the setting up of the Cold Chain, a programme on health education was also to be developed concentrating on utilising the immunisation services, personal hygiene, basic nutrition, family planning, antenatal care and environmental health through EMAs, Estate Midwives, Family Welfare Supervisors and the Creche Attendants.

Water and Sanitation

The objective of the water and sanitation project was to find solutions to the health problems caused by unsafe water and poor environmental sanitation. Although 50 estates, each under the Sri Lanka State Plantations Corporation and the Janatha Estate Development Board, were selected, much time had to be spent in identifying suitable water sources and developing low cost designs which would be more suited for mainly pipe water systems on the plantations. Existing sources were generally from streams and springs which are unprotected and polluted. The storage tanks and pipes had deteriorated and most of the
water supply schemes were either abandoned or in a poor state of repair. Environmental sanitation is closely linked with the availability of water, and latrines on the basis of one privy per family are almost non-existent on the plantations.

Following investigations and surveys it was found that a single plantation would have as many as 15-20 separate water schemes and at the end of 1963 UNICEF was assisting on 20 plantations covering almost 300 separate schemes. Water-seal latrines on the basis of one privy per family are constructed along with the provision of water.

Pilot projects on community participation were also started where the resident community is educated to undertake self-supporting schemes and utilise available health/welfare facilities. These include activities on feeding programmes in the creches improving their living environment, cutting of latrine pits and construction of drinking water wells on a self-help basis. The estate health welfare staff are trained on the implementation of the PHC approach, including infant and young child feeding, prevention and early treatment of diarrhoea in children using simple home remedies and the importance of breast feeding. These programmes have only recently started on a few estates. Community involvement has been very relevant in the water and sanitation projects so that as a consequence, problems of operation and maintenance can be minimised.

Regional Training Centres

Support by way of furniture, equipment and materials has been given to establish regional training centres so that these centres could be utilised for the in-service training of all health welfare staff at the regional level.
Conclusions

Evaluation should necessarily follow the development of a series of data over a time span, commencing before the project and continuing well beyond the implementation period. Had these conditions been satisfied, an impact evaluation still requires a long time span before conclusions can even be tentatively drawn. Both these conditions were absent in the UNICEF programme at the time of the Survey.

It was also not possible to isolate effects which were contributions of the programme itself. Successes as well as failures could be the cumulative effect of exogenous events not controlled by the programme.

The 'control' scenario which was substituted for a bench-mark scenario was not available since the absence of the UNICEF programme here resulted in absence of records, (a very good negative indicator to support the extension of the programme).

The limitations deterred the application of statistical methods to establish 'nuances' of differences between effects and impact in the different groups A, B and C with any meaningful conclusions.

All that could be achieved were a set of trends, an idea of direction and plausible conclusions substantiated by data gathered from more than one angle or source. The most significant impact detected was a singular development of focus of management and workers on programme areas, at times to the neglect of other areas which require attention. This was pointedly felt by attention drawn to the area of the over 6 and under 14 child who was particularly neglected by the management since this group was not in the UNICEF programme. In estates where the UNICEF programme had not begun, some similar programme had been started by the
the management directed at the same targets as the UNICEF Programme in an attempt not to be left out.

The other impact noted was the creation of an awareness, first, among the management and filtering down to the workers - of the need for improvement in the health conditions of women and children.

This led to better monitoring, better recording and better participation of workers and management in common programmes which resulted in contradictions in data where these estates had at times indicators showing higher malnutrition, morbidity and deaths.

UNICEF intervention has, it is evident, proved a catalyst in materially forming positive attitudes, changing attitudes, conscientising both management and workforce in relation to the key areas of the programme.

The analysis in this report, therefore, becomes more meaningful as a bench-mark study or a scenario depicting the travail experienced at the commencement of a programme of this nature. An evaluation of impact can then be planned for two years from now. There is one proviso, however, which requires the most urgent consideration, which is the incorporation of a uniform effective and concise system of maintaining data. Training in maintenance of data should be included within the training programme of the UNICEF. The failure in obtaining a 'control' scenario from the selected estate and the pathetic lack of an awareness of and indifference to health conditions, underscored in the dialogue with women in the 'control' estate, highlighted, to my mind, another important aspect for policy direction. This was the feasibility of designing a programme which would spread itself more extensively at first in providing as a first stage basic necessities of 'water' from a reasonably good source, a good EMA who could perhaps get an initial immuni-
sation programme going through the state health authorities of the area, basic nutrition - Triposha to be given as dry rations if preparation is initially difficult - basic health education focusing at first on a few selected areas, such as drinking boiled clean water and use of toilet with emphasis driven home through visual propaganda of the real meaning and purpose of these health rules, and most of all monitoring health and recording data. This situation could very effectively provide a springboard to launch out on the next stage of further refining the inputs. In the meantime, both the management in every estate and labourers would have the initial infusion of health awareness which alone is able to make the UNICEF inputs meaningful in the life and conduct of workers at the individual level.

This is an important input in the light of the many exogenous factors outside the purview of the UNICEF programme such as bad housing which continue to be a major health hazard. Awareness can generate management interest and more self-help schemes to improve existing housing in the absence of a costly programme for new housing, by eliminating the apathy among estate labour which often lead to their 'putting up' with the most atrocious conditions of living, when they could improve it by a little effort on their part as a community.
Basis of Analysis

The 15 selected estates covering tea and rubber plantations in the agro-climate regions of

up-country;
mid-country; and
low-country

were grouped for investigation and analysis on the basis of actual inputs within the programme and similarity of conditions as conveyed by the survey data.

Groups

1. The 1st Group 'A' comprised five estates having a package of immunisation, creche-upgrading, water and sanitation together with the ancillary inputs of training of staff, provision of equipment for schools and health education programmes. These inputs were in various stages of implementation.

2. The 2nd Group 'B' comprised seven estates with two inputs of immunisation and creche-upgrading and some of the ancillary inputs listed earlier.

3. Group 'C' comprised one estate which had no inputs whatever in 1983 and only sporadic immunisation by State Health authorities in 1982. This was considered the 'control' estate for comparison with the other estates. Investigation in this estate was, however, greatly hampered by a complete absence of records. The type of situation prevailing in this estate is encountered only in exceptional circumstances such as, in this instance, where it was privately owned and has only recently come within the purview of the State sector. Normally, some health inputs, even at a basic level, are found in most plantations.
Analysis of Findings

The end of the programme period had not culminated in the envisaged package of inputs being completely established or the planned coverage achieved.

It was thought timely, however, to assess even in a tentative manner the directions in which the programme was proceeding, trends of change in the areas of concern, and gaps in the programme itself as well as in implementation. The primary objective which was that of measurement of impact was hampered by the absence of a base-line at the beginning of the programme. This itself would have contributed to the inability to set out specific measurable targets in the designing of the programme itself.

The outcome of the survey, however, leaves one in no doubt as to the catalytic effect the UNICEF intervention has had in the areas where the input package has been successfully even if partially implemented.

The inputs selected for assistance by the UNICEF involve some of the crucial areas impinging directly on the health and mortality of children and mothers. Admittedly, the package is not a complete one, there being other equally crucial areas like housing, education and literacy, cultural practices, social considerations and the status of the woman in this group of society whose evolution has been circumscribed by conditions very dissimilar to those experienced by other social groups in the country.

A measurement of impact of the selected inputs on the quality of life of this group of workers cannot, therefore, be carried out without the exclusion of the impact which these latter areas continue to exercise on the entire social fabric.
Other limitations to collection of data and the selection of a methodology for investigation have been detailed in Appendix 'A' of this report. Data had, therefore, to be obtained from different angles and varied sources which when pieced together, presented a scenario from which the changes and developments in areas such as morbidity, mortality and malnutrition could be identified.

Other areas were less specific but had clear indications of improvement as a result of the implementation of the programme.

More relevantly the analysis presents a good benchmark scenario for later comparison, and, while indicating trends for enhancing the inputs also gives guidelines and directions for the next programme. It throws out some gaps in policy and implementation, particularly in the spread and coverage of the area of implementation.

One of the areas identified as requiring attention was the problem of adequate child care. This gave rise to a focus on the establishment of a chain of good daycare centres.

1. Creche

The creche programme was primarily meant to provide for child care in the absence of the mother at work. This was particularly essential in estates where most of the women worked a long day in the plantation and often, small children were left to care for themselves as well as care for infants left in the home. This proved very unsatisfactory both for older children who were as a result deprived of schooling, and for infants who could not have even basic care and safety at the hands of children only a little older.
The creche programme, however, included greater dimensions, acting as a centre for proper child care, nutrition, pre-school education, health education of the child and through the child the mother, community involvement and motivation of parents to strive for a better standard of life.

The data points to the unqualified success achieved in all these spheres in the reach and impact not only materially but psychologically on the entire household by the running of a 'good' creche, and also conversely to the lack of motivation in those areas where the creche is poorly run or not functioning at all.

Inhibition to creche utilisation by mothers should be further identified and removed in order that its package of benefits can reach the maximum of the target groups of women and children.

Creche utilisation

Both Groups 'A' and 'B' felt the impact of the creche in varied degrees. Group 'A' had 84% of creches upgraded and creche utilisation was a high average of 92% of children 0-6 years in three estates in the group and a general average of 52% in the group of five estates. In two estates where utilisation was low the upgrading was not complete.

In Group 'B' where only 71% of the creches were upgraded, the average utilisation was only 48%. Group 'C' had no creche at all.

Utilisation was considered a primary impact of the creche programme. It was clear that a creche as solely a place for housing children, had little utility in the plantation. The efforts involved in taking a child to the creche which was an additional chore for the mother, had to be worthwhile. In such instances, they arranged to keep the child at home. The analysis, therefore, dwelt on characteristics which could be correlated with utilisation.
A complex of conditions, attitudes and circumstances contributed in dissimilar ways in the different estates to the utilisation or under-utilisation of creches. These factors had to be elicited from women’s perceptions, investigators’ observations, opinions expressed by creche attendants, superintendents and health workers as well as from data from creche records.

It was established that in most of the creches attendance was not regular, in that the number of children brought to the creche fluctuated with the weather, the working days of the mother, illness of the mother and facilities at the creche. It was found that on days when supplementary foods were given at the creche the attendance was good and in general where the pre-school programme and child care by a trained attendant was available, attendance was good.

Estate records pointed to a creche programme in Group 'A' which on the average had reached high standards of achievement in establishing trained attendants (95%), facilities such as water and sanitation (79%), supplementary feeding of milk and triposha (100%) and pre-school (100%).

The achievements in Group 'B' were slightly less in proportions but, nevertheless, sufficient to motivate mothers to use the creche more often.

Likely factors which may have led to low utilisation have, however, been highlighted by the observations and the interviews, some of which throw some light on the variations in the quality of creches even within one estate.

Low utilisation appeared to be correlated to fluctuating standards in creches in relation to the facilities mentioned earlier.
Creche observations in Group 'A', particularly in those estates with low utilisation, remarked on some creches where the children were not clean, where cooking facilities were makeshift so that milk and triposha (cereal) could not be prepared regularly. The distance from the 'line-rooms' was a factor which militated against the use of the creche by some mothers. In Group 'A' generally 24% of observed creches were found to be in need of repairs. They were overcrowded and lacked adequate play or reading materials. Some of these, however, had good creche gardens, toilets and utensils for cooking but no separate kitchen. In some of the 'good' creches there was a shortage of cups and plates, toys and reading materials.

All creches appear to have a problem of storage for milk and triposha.

In the creches with low utilisation there was also a high ratio of children per creche attendant, as much as 40 and 45 which would affect the quality of care given to the children.

This ratio was lower in Group 'B', ranging from 17 to 42, but there were other weaknesses and wider gaps in inputs to the creche programme in Group 'B' suggesting likely reasons for low utilisation in these estates. Overcrowding was the main problem in 68% of the creches observed in Group 'B', while many of them (46%) had no separate kitchen and no proper cooking facilities.

Toilets were grossly inadequate and some which had toilets had no regular supply of water. Generally, all creches had an acute problem without vessels for boiling and storing water, or for storing water in times of drought when water had to be fetched from great distances. The inference is that in many of them drinking water is not boiled.
The absence of facilities, the pre-school programme and the irregular supply of milk and tripods even in creches where these facilities were stated to be available, was further confirmed by interviews with mothers and creche attendants which showed serious gaps in implementation and weaknesses in maintenance of facilities. Interviews of mothers indicated that some likely factors for non-utilisation were those of 'overcrowding', 'distance to the creche', 'absence of proper care', 'spreading of infection', 'unkindness on the part of the attendant', while creche attendants too admitted to the lack of facilities for pre-school programmes, creches where milk feeding had been suspended, lack of space, the dilapidated state of some buildings and sometimes lack of cooperation from the parents. The pre-school programme appeared to be absent in most creches due to lack of training of creche attendants in this field and also to lack of space to separate children by age groups, for teaching.

Despite these negative aspects highlighted as inhibitions to the wider use of creches, there was a group of creche users on whom the impact of the creche programme was very marked and very positive. The impact was greater in most indicators as well as in general satisfaction in Group 'A' than in Group 'B'.
The responses of creche users to queries regarding facilities and benefits showed an awareness of conditions in the creche. While conscious of the benefits to themselves and the children, they were conscious also of the defects in the creche and showed sufficient interest and involvement to suggest remedial measures.

The general satisfaction with the creche attendants' ability to provide clean accommodation, kindness and care was very high in both Group 'A' (96%) and in Group 'B' (96%). There was satisfaction about the improvement in health of the children in the creche. Arising from this involvement and community participation were suggestions to improve the creche, such as more feeding of supplementary foods and milk, affording more space for separating infants from other children. The absence of the pre-school programme was not as keenly felt by mothers due perhaps to the low priority for education in general. The feeding programme, on the other hand, appeared to have wide appeal to mothers.

The role of the creche in educating and raising health awareness in the parents was clearly borne out in the perceptions of the mothers on other benefits from the creche. In reiterating the lessons learnt by children in health, such as using toilets, boiling water used for drinking, washing hands before meals, singing and drama, and religious observances, the mothers revealed their awareness of these factors through the children. This seemed a very effective entry point to the otherwise inaccessible female plantation worker with little time
and energy left to attend health education classes or demonstrations.

It was also found that in Group 'A' 23% of the women who did not usually use the creche, nevertheless, took the children in time for milk, triposha, rice or congee given in the creche. The creche was in this instance used as a nutrition centre. Distance and there being no one to take the children regularly to the creche, kept others away from utilising even this benefit, and this was a sizeable proportion (77%) of children not using the creche who did not get the benefit of supplementary foods even at home.

The superintendents were keen to develop the creche since they saw in this a very effective instrument in attacking the problems of high morbidity from malnutrition related diseases in particular and mortality among infants and young children. The impact on health and malnutrition will be dealt with later on.

The creche programme, therefore, has had a far-reaching impact on mother and child as well as on the community of workers and the principle of the creche package if not the creche itself merits wider application, if it can be carried out in smaller locations, more spread out in the plantation and more accessible to the mothers.

2. MCH Services

Coverage

Immunisation of pregnant women with tetanus toxoid, and of children with BCG, DPT and OPV was the main thrust of the health programme for mother and child. This was an area where not only coverage but direct impact was easily measurable if morbidity records were available.
Groups 'A' and 'B' had completed or partially completed the programme, while Group 'C' had no programme planned for it.

2.1 Infants

Coverage of infants was highest in ECG since it is done at birth and is a single dose. While the coverage was as high as 74% in some estates for OPV and 77% for DPT in 1983, it was very low in others and in some had not begun at all due to problems with medical staff.

2.2 Children between 1-6 years

Records showed a much lower coverage in this group. But this was partly due to weaknesses in record-keeping for the period before 1983. While records showed a coverage of 28% for ECG, 52% for OPV and 31% for DPT in Group 'A', mothers' interviews indicated much higher proportions of 93% for ECG, 97% for OPV and 99% for DPT. The picture was similar in Group 'B'. These immunisations had taken place before record-keeping on this category of children became a practice in the estates.

Group 'C' had no immunisations at all in 1983, but a few of the children had been immunised by the State health authorities before 1983.

2.3 Pregnant women

It is not always possible to obtain coverage of all the pregnant women in the estate unless they attend the clinic or creche or come voluntarily for immunisation. The records, however, show total coverage of women attending clinics in Group 'A' and about 91% in Group 'B'. Clinic attendance was enhanced in some estates in Group 'A' by the regular distribution of dry rations of supplementary foods to the mothers.
The response from mothers' interviews indicated that they had immunisation during the most recent pregnancy but not for the earlier ones and showed a coverage of 90% in Group 'A' and 91% in Group 'B' of those pregnant in 1983.

2.4 Impact

The impact of this programme is seen very clearly in the absence of any records of incidence of these diseases in 1983, while there have been some cases of whooping cough, tuberculosis and diphtheria in 1982 in both Groups 'A' and 'B'.

Interviews with mothers reported occurrences of these illnesses in the family before 1983. Coverage being incomplete, there may have been isolated cases of illnesses but the fact that these have not been noted indicates that infectious diseases of this type have ceased to be a major health hazard in this sector.

The programme has, however, to be taken forward to clear the backlog as well as immunise new infants and mothers and extended particularly to the 6-11 age group.

3. Health Education

Health education programmes took the forms of distribution of leaflets, display of posters, meetings and home visiting, films and lectures in Group 'A' where the participation rate was 47% of workers. This participation was mainly attendance at a film show.
In Group 'B', the only programme was a film show and participation was 13%. Home visiting was only sporadic.

The impact of health education on the community was assessed by interviews with women and their husbands.

Four areas were selected for inquiry. These were:

(1) Information on how to look after the health;

(2) How to feed children;

(3) Space births;

(4) Importance of drinking good water.

The question was whether anyone had spoken to them regarding these aspects of health. In both Groups 'A' and 'B', the majority of them had heard of these but deeper probing revealed that the message had not been meaningfully received in relation to some of these aspects.

The question was asked whether drinking water was boiled always. Some of them who said they did, did so only at times. The investigators' dialogues, however, revealed about 70% of those who said they boiled water, only heated it because of the weather conditions. They did not appear to realise the danger of contamination since they used containers into which children and even the women themselves dipped unclean tins and mugs to take water and even dipped dirty hands into the water.
There appeared to be a serious gap in health education as evident also from the alleged misuse of toilets. The superintendents of over 50% of the estates felt that health education should be improved in their estates. Some of them did not have any consistent or practical programmes.

Group 'C' had a small proportion of only 9% who had heard about drinking pure water. They did not, however, boil their water. The husbands interviewed in Group 'C' regarding knowledge of ways to improve their family's health, replied that they had no knowledge and were not interested.

In Group 'A', about 65% of the husbands were aware of health and nutrition rules and advised their wives about these and about cleanliness and the use of toilets.

In Group 'B' only 37% of husbands were aware of these.

In the field of family planning only 44% practised in Group 'A' and 44% in Group 'B'. A fair proportion in each of the groups said they "did not know", "were afraid", or "did not like".

The category saying "want more children" was further analysed to find out how many each of them already had. Of these, a fair proportion in both Groups 'A' and 'B' had only one child. There were, however, in Group 'A' 47% with 2 children, and others with 3 or 4 children, and in Group 'B' 31% with 2 children, and others with 3 and 7 children wanting more children, which calls for more intensified facilities for education and family planning.

Interviews with EMAs and superintendents stressed the need for more attention in this area. At present the only methods available were vasectomy for men and tubectomy for women. Even those who want tubectomies have to be on a waiting list in the nearest government hospital.
4. Training

The training of personnel for health and immunisation and child care is a very vital ancillary input in the UNICEF programme. The training itself is carried out by existing institutions. The Medical Faculty, the Family Planning Association, the Labour Department, the Army Hospital have been some of those responsible for undertaking short-term training courses for Estate Medical Assistants and midwives and Family Welfare Supervisors, while the creche attendants have been trained by the School of Social Work and Sarvodaya (a village level NGO).

These courses have necessarily been short-term ones directed very specifically to certain inputs in the programme.

The output of such training did not appear to have much consistency. Performance varied widely and so did the quality of the personnel. Enthusiasm and interest and motivation by the management appeared to fill in the gaps in training. What is required apparently is a continuation of the training, particularly of EMAs and creche attendants to meet these deficits.

The EMAs category included some Assistant Medical Practitioners and Registered Medical Practitioners who had basic medical training and were among the 80% of EMAs in Group 'A' and 57% in Group 'B' who were satisfied with their competence to deal with endemic diseases and injuries. They were also among the 30% in Group 'A' and 72% in Group 'B' who wanted more training in pre- and ante-natal care and in modern methods of diagnosis and treatment.
The UNICEF aided training however was limited to the narrow area of administering vaccines. Some of the estates where the immunisation programme was stalled or slow in implementation attributed it to the inefficiency of the EMAs, absence of an EMA, to having one EMA covering a number of estates and lack of interest of the EMAs.

There was also an indication that personnel trained in immunisation alone were not only given a title implying medical knowledge but also tacitly expected to perform medical functions for which they have not been trained.

**Family Health Supervisors**

These were again trained only to carry out work related to Family Planning but the designation implied wider knowledge as well as wider functions. Their work in family planning was hampered by the absence of facilities for any method other than sterilisation for the female and vasectomy for the male, which are obviously of limited relevance only.

Records state that only 36% of them were trained in Group 'A' and 57% in Group 'B'.

The superintendents gave ratings of 'fair' to 'not at all satisfactory' in Group 'A', while 50% of them expressed their dissatisfaction of this grade of worker in Group 'B'.

When questioned about their ability to meet the demands in maternal health care and family planning, the Family Welfare Supervisors themselves were critical of their performance. Since 33% of them in Group 'A' and 40% in Group 'B' could meet the needs only "partly" and in Group 'B' 10% of them could do so only "rarely".
Creche Attendants

Those were found satisfactory by the superintendents in all the estates investigated. The parents were generally satisfied with child care in the creche except for a few who were critical of her attitude to the children in the creche.

The attendants themselves were questioned as to their training in relation to the work they are expected to perform.

Out of those interviewed 20% in Group 'A' and 35% in Group 'B' thought their training was adequate, and some explained that low performance was due to other extraneous factors such as lack of facilities.

However, there were 80% in Group 'A' and 65% in Group 'B' who felt their training was too limited and the course was too short. The areas singled out for further training were pre-school activities, nutrition, health education, maintenance of records and health inspection. Some of them rated their performance in the creche in these areas from "average" to "poor" owing, mainly to poor training in those fields.

In general, the areas selected for training are specific and relevant to the entire programme. Wherever the training has matched motivation and interest by the management, the impact, particularly in the areas of immunisation and creche care, has been catalytic. The expressed need for continued training in these fields should be met in future programmes. A further observation is that the specificity of the training limits some functions to the extent of it being impractical to have many categories, each trained in one narrow field of work, and expected to concentrate on that area alone. The inevitable consequence
is that in operation in a situation where local medical facilities are poor or absent "health personnel" begin to be connected with medical and health functions for which they are not trained.

This could perhaps be remedied by expanding the area of training of the health workers and by having some institutional medical facilities even at a basic level in all plantations.

**Impact**

As stated before, considering the specific areas of training, the immunisation programme and the creche programme showed very clearly that good performance did relate to training even with the gaps in training pointed out.

The impact of family planning was felt clearly in the knowledge of family planning as shown earlier in this report. The gaps in practice were not owing to any fault in training or dissemination of information of the FWS but were solely due to lack of facilities.

5. **Water and Sanitation**

The message of safe drinking water is relevant to all groups of society in Sri Lanka, but more so for those in the estate sector where high infant mortality and morbidity are due partly to bowel diseases caused directly by contaminated water and by exposed faecal matter.

The provision of safe water and toilets is, therefore, a vital need in combating water-borne and viral diseases.

The problem in the estate sector is complex in both areas of water and sanitation. It presents a question of
utilisation as well as provision. Both items require large financial investments and both can be rendered completely ineffective by bad usage. This area is therefore closely tied up with education and propaganda.

Group 'A' had some estates where this input was completed and therefore had 60% of the group with a regular supply of good water in close proximity to the houses. In Group 'B' only 14% of the estates had a 'satisfactory' water supply from spouts and streams and some wells. The balance in both groups had irregular supplies at some distance from the houses. The quality was 'satisfactory' as perceived by the women interviewed. There did not appear to be any serious effects of contamination from these sources although the possibility of mild bowel ailments cannot be ruled out.

Both in Group 'A' and in Group 'B', where the water supply was satisfactory, the use and availability of toilets was 'good', and some estates in Group 'A' had one to three households per toilet. The women's interviews revealed the absence of toilets or of usable toilets in 40% of the estates in Group 'A' and 72% in Group 'B'.

The superintendents deplored the misuse of toilets, particularly when they were common or shared, and the inability to use them anyway in the absence of a regular water supply.

In Group 'C', 22% of the women stated that the toilets had broken down and were not in use.

In all the estates there were small proportions of toilet users who, nevertheless, restricted the use to adults only, while children defecated in the compound, thus creating a health hazard anyway. There was a small proportion of women whose reason for not using
a toilet was very significant. They stated that "it was not their custom" to use toilets.

While the impact of a good supply of water close to their homes was clearly seen in cleanliness of surroundings and homes remarked on by the observations of investigators, there was no particular evidence of an increased incidence of bowel or water-borne diseases in estates where the water supply was stated to be irregular and toilets not used or non-existent. This was due partly to the good weather conditions which prevailed for a considerable length of time before and during the survey ensuring a plentiful supply of water in the streams, spouts and wells. These dried up in the dry period and it is then that the consequences of bad water and environment pollution affect personal hygiene, cleanliness and bring on disease and death.

6. **Impact of inputs on the health conditions of women and children**

The investigation with all its limitations has been able to identify some specific areas of impact related to implementation.

It is useful, however, to consider general health and morbidity patterns, as far as the data allows such analysis to note broad trends of improvement, areas of progress or pockets of stagnation.

Data was collected from records and from interviews of women on the following:

1. Infant deaths and cause.
(3) Malnutrition among infants, children, pregnant and lactating mothers.

(4) Maternal deaths.

Data was mainly in relation to 1982 and 1983 records, while in interviews too the period of recall was the past two years.

This data has been analysed under broad categories in the section that follows.

6.1 Infant deaths

Data for 1982 and 1983 showed a considerable lowering of infant mortality in both Groups 'A' (41 to 25 per 1000 live births) and in Group 'B' (69 to 55 per 1000 live births). The divergence of mortality rates between the two groups indicates the positive results of greater improvement in health conditions in Group 'A' than in Group 'B'.

Cause of death

Data from records were analysed first as aggregates of the two years 1982 and 1983. The highest proportion of deaths in both Groups 'A' and 'B' was caused by prematurity.

While infantile debility and malnutrition came next in both groups, diarrhoeal and respiratory diseases were responsible for the third highest proportion of infant deaths in Groups 'A' and 'B'. Group 'B', however, had a significantly higher proportion of deaths from respiratory diseases than Group 'A'.

Comparing the two years it was significant that Group 'A' which had some deaths from malnutrition and respiratory ailments, had no deaths from these causes in its 1983 records.
In Group 'B', however, where health and nutrition inputs were much less than in 'A', records indicate marginal reduction in proportions of deaths from these causes in 1983 over 1982.

Both groups had deaths from diarrhoea in 1982, but had no records of deaths in 1983. While Group 'A' had some deaths from debility in both years with a lesser proportion in 1983, Group 'B' had some deaths from debility in 1982 but none in 1983.

Information of a slightly different nature was obtained from women who were asked to recall any deaths of children in their family during their married life and also to state cause. Admittedly, though occurrences of deaths could be remembered the cause may not be all that reliable. This data, however, served to provide a broad idea of the incidence of deaths in past years, age at death and likely causes.

It was significant that 38 per cent of women in Group 'A', 27 per cent in Group 'B' and 36 per cent in Group 'C', had at least one child dead before 14 years of age. The highest incidence of death was found to have been in the age group 0-1 year (84% in A, 82% in B, 75% in C). The major causes given related to the areas of malnutrition, respiratory ailments and diarrhoea, indicating that these were common causes in this sector for deaths in infants.

6.2 Deaths of children 1-14 years

Generally the proportion of deaths in this age group was much less than among infants in all three groups. In Group 'A', which had deaths from diarrhoea and malnutrition in 1982, there were no records of deaths in
1983. Group 'B' has been able to reduce marginally the proportion of deaths in 1983 from 1982.

The improvements in Group 'B', however, were not as much as had occurred among infants, since deaths from debility of young children had marginally increased in 1983 over 1982.

6.3 Maternal deaths

There were no records of maternal deaths in 1982 or in 1983 in either Group 'A' or 'B'.

7. Morbidity

Incidence of illness is of great significance in assessing impact, since elimination of fatality is only the first step in attacking the problem.

Recording of information, particularly on the out-of-creche child, was very poor or non-existent. Some records were available in respect of 1983 on the 0-6 year children who attended the creche or were treated in the estate.

7.1 In Group 'A', where the recording was better, there was a fair proportion who had diarrhoea or respiratory ailments in 1983. These proportions were slightly less in Group 'B', but could be due to poor recording in some of these estates.

7.2 Malnutrition - children 0-6 years

The proportion of malnourished children was higher in Group 'A' than in Group B. This was again due to better monitoring and higher utilisation of creche in Group 'A', while Group 'B' did not have proper records in
creches. Identification, as a first step to treatment, was more efficient in Group 'A', where the nutrition programme had greater reach.

7.2.1 Malnutrition—mothers

It was difficult to trace pregnant and lactating mothers in the estates unless they attended a clinic for treatment. In Group 'A' monitoring was done by encouraging women to attend a creche or clinic where triposha was prepared for them. Group 'A', therefore, recorded a higher proportion of malnourished than Group 'B'. Dialogues with the staff revealed that triposha (cereal) was not utilised due to lack of facilities for preparation. Dry rations were discouraged since it was alleged that mothers sold the cereal. Interviews with women, however, revealed that some of them did get these dry rations and this was shared by the entire family when it was prepared at home.

Incidence of maternal malnutrition was also reflected in low birth-weight babies born averaging a proportion of 20% in Group 'A' in 1983 with a range of 0-63%. In Group 'B' where records were not so good, this average was 21%.

The prevalence of premature births of 5% in 1983 in Group 'A' and 7% in Group 'B' again points to the persistence of malnutrition among mothers.

Community Participation

The need for parental involvement was seen as crucial to the programme for community development. Participation in creche activities was high in both groups and this was mainly by women. Participation in other activities, such as building toilets and wells, cleaning roads and line-rooms was minimal in all three groups. Motivation for such service was stated to be high in a few estates in Group 'A'
where the welfare programme was going on successfully.

The reasons for such non-participation were given as "No such activity" by a majority interviewed. "No time" was the reason given by the next highest proportion. Cultural problems were highlighted by some who stated that the husband "did not like", "had family problems", "No freedom to go out and work". Problems of non-cooperation were highlighted by some who stated that they were angry with other workers and did not wish to work together.

**General Conclusions**

1. **Immunisation**

   The cold chain for vaccines appeared to serve a useful function since no comments on shortage of vaccines were made. On the contrary many of the officers were positive about the availability of vaccines. While some of these estates achieved 'complete success' in the programme others achieved only a partial success. Some attributed complete success to the UNICEF intervention, while others who did not come within the UNICEF scheme achieved it due to the efficiency of the management, the medical staff and the cooperation of the government medical authorities in the area. A common feature of 'success' in this sphere, was however the availability of a good estate medical officer and supporting staff. UNICEF intervention was very positive in its effect on the programme in providing vaccines and training. Some of the medical staff in the estate had their sole training in immunisation and so considered it their primary function.

   Those who could not successfully carry out the programme attributed it to staff, lack of interest and
lack of cooperation by the workers themselves, which shows a lack of motivation. One superintendent attributed the incompleteness of the programme to an old and ineffective EMA.

The dialogues with management and medical staff revealed the fact that the 'immunisation programme' to their minds was confined to the under six year olds and to pregnant mothers. This appeared to result directly from the UNICEF focus on these groups. This was so even in areas where the UNICEF programme had not started as yet and where estates carried out their own programme. This is evidence of the catalytic effect of intervention in others wishing to emulate successful programmes in other estates.

A comment that could be made on programmes outside the UNICEF is that success was achieved purely on the enthusiasm and motivation of the estate management and took place in exceptional cases and were necessarily dependent on temporary circumstances, whereas the UNICEF intervention could achieve far more uniform and continuous results.

No estate had carried out any immunisations in other age groups despite the inclusion of school children in the programme.

2. Croche

Socio-economic factors have been very materially related to the health and nutrition conditions of mothers and children in the estate sector. Altering ingrained habits and patterns of living at the micro-level is an insurmountable task. The croche providing at its basic level a place where children can be kept under adult supervision during the mother's working hours is now being utilised very effectively to deliver a package of benefits which can in the long term prove the catalyst in radically
altering eating habits, health awareness, education, nutrition, good conduct, cooperation, community work and a host of vital factors affecting the quality of life of estate labour.

As a first step, therefore, more creches closer to line-rooms with perhaps basic facilities for cleanliness and nutrition programmes only, at first, could be set up. These could later be upgraded to improve and increase facilities. This would help in initially increasing the present low rate of creche utilisation in some estates where constraints such as distance, overcrowding, inadequate attention, and more important, absence of a feeding programme have kept children away from the beneficial influence of the creche.

3. Water and Sanitation

The supply of pure water on tap for drinking is yet only an ideal situation which is slow in implementation due to the costs of purifying water to the standards required. The alternative to this ideal at present in the estates surveyed appear to be "no water", only a seasonal supply of water, or water available at great distances from the residences and from sources such as streams and spouts.

Considering that many of the estates investigated relied on these sources of water anyway and considered the quality acceptable by their standard appears to preclude at the very least bad or contaminated water being used at present. One step towards making these supplies available in close proximity to their homes would enable one facility towards better hygiene - the provision and utilisation of toilets and better personal cleanliness, and as a direct consequence elimination of contamination by exposed fecal matter around the residences.
An interim step to 'pure' water supply in these estates where the supply now being used is at least free from contamination or serious health hazards, could be the regular supply of 'water' with easier access coupled with a concerted programme of propaganda for 'boiling' drinking water.
### TABLE 1

**IMMUNISATION OF INFANTS (From Records 1983)**

<table>
<thead>
<tr>
<th>Category of Estates</th>
<th>Total</th>
<th>BCG</th>
<th>OPV</th>
<th>DPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. (No.)</td>
<td>175</td>
<td>155</td>
<td>100</td>
<td>112</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>100</td>
<td>92</td>
<td>71</td>
<td>77</td>
</tr>
<tr>
<td>B. (No.)</td>
<td>352</td>
<td>313</td>
<td>280</td>
<td>270</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>100</td>
<td>89</td>
<td>80</td>
<td>76</td>
</tr>
<tr>
<td>C. (No.)</td>
<td>-</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### TABLE 2

**IMMUNISATION OF CHILDREN 1 - 6 YRS (From Records 1983)**

<table>
<thead>
<tr>
<th>Category of Estates</th>
<th>Total</th>
<th>ECG</th>
<th>OPV</th>
<th>DPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. (No.)</td>
<td>1,010</td>
<td>305</td>
<td>321</td>
<td>315</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>100</td>
<td>28</td>
<td>32</td>
<td>31</td>
</tr>
<tr>
<td>B. (No.)</td>
<td>2,118</td>
<td>1,563</td>
<td>1,541</td>
<td>1,557</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>100</td>
<td>74</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>C. (No.)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mean (%)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### TABLE 3
CRECHE FACILITIES (From Records 1983)

<table>
<thead>
<tr>
<th>No. of children 0 - 6</th>
<th>Children in Creche</th>
<th>No. of creches</th>
<th>Children per creche</th>
<th>Children per creche Attendant</th>
<th>No. of Creche Attendants</th>
<th>% of trained creche attendants</th>
<th>% of untrained creche attendants</th>
<th>% of children in creche Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1,199</td>
<td>625</td>
<td>19</td>
<td>16</td>
<td>33</td>
<td>33</td>
<td>95</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>2,516</td>
<td>1,936</td>
<td>38</td>
<td>27</td>
<td>50</td>
<td>38</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>No. of Women with children (0-6 yrs)</td>
<td>No. of Women using creche facilities</td>
<td>No. of Women Stating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>---------------------------------------</td>
<td>----------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satisfied with Creche Attendant</td>
<td>Creche attendant kind to children</td>
<td>Creche attendant consults parents</td>
<td>Creche is clean</td>
<td>Creche attendant regular in attendance</td>
<td>Space sufficient</td>
<td>Facilities available for play, feeding and sleeping</td>
<td>Health cards maintained</td>
</tr>
<tr>
<td>A 125</td>
<td>82</td>
<td>80 80 79 74</td>
<td>39 46 62 67 66 81</td>
<td>134 136 129 132 137</td>
<td>30 63 81 56 102 134</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 187</td>
<td>139</td>
<td>134 136 129 132 137</td>
<td>30 63 81 56 102 134</td>
<td>129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 23</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 5
DEATHS OF INFANTS BY CAUSE (From Records 1983)

<table>
<thead>
<tr>
<th></th>
<th>Total No. of Infants</th>
<th>No. of Deaths</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Premature births</td>
</tr>
<tr>
<td>A</td>
<td>175</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>329</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>Not available</td>
</tr>
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</table>

### TABLE 6
DEATHS OF CHILDREN 1 - 14 YEARS BY CAUSE - FROM WOMEN'S INTERVIEWS

<table>
<thead>
<tr>
<th></th>
<th>1 - 6 Years</th>
<th>Causes</th>
<th>6 - 14 Years</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total children ever born</td>
<td>Deaths of children 1 - 6</td>
<td>Total children ever born</td>
<td>Deaths of children over 6 and up to 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Causes</td>
<td></td>
<td>Causes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accident deaths</td>
<td>Malnutrition</td>
<td>Other diseases</td>
</tr>
<tr>
<td>A</td>
<td>565</td>
<td>8</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>798</td>
<td>17</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>133</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* Epilepsy, fever, convulsions, leukaemia.
TABLE 9
MAL/NUTRITION IN PREGNANT AND LACTATING WOMEN
(From Records 1983)

<table>
<thead>
<tr>
<th>Total Pregnant and Lactating women</th>
<th>No. Malnourished</th>
<th>Mean (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 382</td>
<td>170</td>
<td>44</td>
</tr>
<tr>
<td>B 780</td>
<td>310</td>
<td>39</td>
</tr>
<tr>
<td>C</td>
<td>No records</td>
<td></td>
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</tbody>
</table>

TABLE 10
PREMATURITY AND LOW BIRTH WEIGHT IN BABIES (From Records 1983)

<table>
<thead>
<tr>
<th>Total infants born in 1983</th>
<th>Normal weight 5 lbs and over</th>
<th>Low weight under 5 lbs</th>
<th>Premature births</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 175</td>
<td>136</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>B 329</td>
<td>232</td>
<td>72</td>
<td>23</td>
</tr>
<tr>
<td>C</td>
<td>No records</td>
<td></td>
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</tr>
</tbody>
</table>
**TABLE 11**
COMMUNITY PARTICIPATION BY WOMEN IN THE SAMPLE

<table>
<thead>
<tr>
<th>Total No.</th>
<th>No. of women participating</th>
<th>Types of Activity</th>
<th>No. of women not participating</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Helping in creche</td>
<td>No time</td>
<td>No activity</td>
</tr>
<tr>
<td>A 160</td>
<td>55</td>
<td>32 1 1 22 9 1</td>
<td>105</td>
<td>39 61 1 3 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>B 224</td>
<td>59</td>
<td>42 0 7 16 0 0</td>
<td>165</td>
<td>58 106 1 2 3 1 1 1 2</td>
</tr>
<tr>
<td>C 32</td>
<td>0</td>
<td>0 0 0 0 0 0</td>
<td>32</td>
<td>0 32 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
### TABLE 7
MORBIDITY OF CHILDREN 0 - 14 YEARS (From Records 1983)

<table>
<thead>
<tr>
<th></th>
<th>Total children 0 - 14 years</th>
<th>Type of Illnesses</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Diarrhoea</td>
<td>Respiratory</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>No. 2,736</td>
<td>513</td>
<td>730</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean (%)</td>
<td>19</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>No. 4,575</td>
<td>583</td>
<td>556</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean (%)</td>
<td>13</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>No.</td>
<td></td>
<td>No records</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 8
MALNUTRITION IN CHILDREN 0 - 6 YEARS

<table>
<thead>
<tr>
<th></th>
<th>Total children 0 - 6 years</th>
<th>No. of malnourished</th>
<th>Mean (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1199</td>
<td>513</td>
<td>43</td>
</tr>
<tr>
<td>B</td>
<td>2516</td>
<td>782</td>
<td>30</td>
</tr>
<tr>
<td>C</td>
<td>No Records</td>
<td>No Records</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A

Limitations.

In a preliminary investigation made by visiting three estates, prior to the survey, it was found that there was a wide variation in implementation of welfare schemes, administration, quality of personnel ability, facilities, maintenance of records and in the interest and involvement of the management in welfare activities in the plantations. It was, therefore, to be expected that variations in techniques of investigation would have to be made in operation and these were made by monitoring the field activities while the investigators were on the field and also by discussions at the head office with the investigators at the conclusion of each lap of the survey. At these discussions, problems encountered in the field were ironed out. It gave an opportunity for a perusal of all the data collected by each team for editing and clarifying wherever necessary. In certain instances investigators were sent back to fill in gaps in data collection and in others these gaps were filled by communicating with the estate personnel by telephone and correspondence.

A major departure of the actual from the design was found in relation to the 'control' estates selected. It was found that two of these estates had actually some inputs from the estate administration itself and so did not provide the scenario expected from the 'control' condition. The actual 'control' situation was, therefore, provided by one estate.

It was also found that in some estates, more inputs than were expected had gone into the welfare scheme.

There was no region-wise difference in conditions in the areas of investigation. The agro-climate regions
were, therefore, ignored in the final analysis of data.

The estates were re-grouped for analysis on the basis of actual inputs and similarity of conditions seen in the survey data. Analysis was, therefore, carried out on the basis of three groups.

1) 'A' comprising five estates having a package of immunisation, creche upgrading, water and sanitation;
2) 'B' group with immunisation and creche upgrading comprising 7 estates; and
3) 'C' group comprising one estate which had no inputs whatever in 1983, and sporadic immunisation by State Health authorities in 1982.

One major limitation in data collection was the weaknesses encountered in record-keeping specifically.

(1) The absence of a uniform system of maintaining records;
(2) Limitations in coverage of inputs in areas which were investigated;
(3) Absence of separate records for resident estate workers;
(4) Absence of records for periods before 1983;
(5) Unreliability of recording even in respect of 1983;
(6) Ambiguity in recording, e.g., causes of death and illnesses.

Limitations in assessing differences between groups

Theoretically, there should be significant differences in the impact based on the differences in the package of inputs, and these differences should be manifest in the key indicators. Statistical tests worked out proved inconclusive
in some areas since indicators like malnutrition and morbidity patterns were not always consistent with the package of inputs. This could arise from two causes:

(1) The weaknesses in recording;

(2) The differences of periods of operation of the programme.

To illustrate. In some estates within the group an input had been established two to three years ago and some impact could be assessed while in others it had begun late or had begun just prior to the survey.

The 'control' estate could not fully serve its purpose since in addition to absence of inputs there was also no recording system in the estate.
APPENDIX B

Methodology

The primary source of data was records maintained by estates pertaining to various activities in the programme. These were in respect of resident workers in the plantations selected for investigation. They were supplemented with interviews with a sample of recipients, i.e., households with children under 14 years of age where the mother was interviewed, interviews with a sample of their husbands, interviews with medical and health workers, creche attendants and estate superintendents. This information was additionally supplemented with observations by the investigators of a sample of creche schools and clinics/dispensaries.

Sampling Design

The selection of the sample of estates was made after stratification of all estates by agro-climatic regions comprising three strata:

(1) Up-country
(2) Mid-country
(3) Low-country.

The next consideration in selection of the sample was the inputs of Immunisation, Creche, Water and Sanitation.

An important consideration was also the question of operational facility. While ensuring that the sample contained estates with varying combinations and degrees of inputs – according to the information available at the UNICEF Office – an attempt was made to minimise travel within each region, to save on time and cost. The selection was to this extent purposive.
A total of ten estates were selected in this manner, three in the up-country region, four in the mid-country and three in the low-country.

In the absence of any bench-mark study to compare the impact of the programme an attempt was made to study these estates in relation to a 'control' group of estates where no inputs were made by the UNICEF. As such, one estate in each region was selected as 'control', based on information available at the UNICEF Office.

While the data from records was in respect of all resident households in the selected estates, the questionnaire was directed to a randomly selected sample of 416 women from a list of women with children 14 years and under 14 years old. A further 65 questionnaires were addressed to randomly selected husbands of these women.

Questionnaires were also directed to 11 Estate Medical Officers, 20 Health Workers and Midwives, 36 Croche Attendants, 11 School Teachers and 13 Superintendents of estates, making a total of 572 interviews. In addition, a total of 31 croche and 5 clinic observations were made.