SUMMARY REPORT OF THE USAID ASSISTED ICDS IMPACT EVALUATION PROJECT IN PANCHMAHALS (GUJARAT) AND CHANDRAPUR (MAHARASHTRA) 1984-1990

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USAID Assisted ICDS Impact Evaluation

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HIGHLIGHTS OF THE FINDINGS

Marked improvement in the coverage of the target mother and child population for ICDS services was observed over the five year period, but the coverage did not reach pre-set project targets. Inspite of this, the impact of the ICDS services in concert, resulted in a substantial improvement in the survival, and health and nutritional status of children and pregnant women.

Infant mortality was reduced by 35% in Panchmahais and by 38% in Chandrapur and toddler mortality by 9% in Panchmahals and by 27% in Chandrapur. Furthermore, severe mainutrition in children 0-36 months of age was reduced by 25% in Panchmahals and by 53% in Chandrapur. The prevalence of moderate plus severe mainutrition was reduced by 13% in Panchmahals and by 32% in Chandrapur. In children 37-72 months of age, the decline in severe mainutrition was 36% in Panchmahals and 68% in Chandrapur. The decline in severe plus moderate malnutrition was 9% and 29% in Panchmahals and Chandrapur respectively. Major declines were also observed in Vitamin A deficiency in children and iron deficiency in anemia in pregnant women. These achievements are consistent' with those anticipated per the USAID Assisted ICDS Project goal in Chandrapur. but fell short in Panchmahals with the exception of the decline in infant mortality, due in part to severe drought which affected that district.

Since most of the pre-set goals of the USAID-ICDS model were met, it needs to be supported and extended to other ICDS blocks in the country. Greater efforts need to be made to assure near universal coverage of priority groups with essential health and nutrition services in the ICDS programme in order to obtain the maximum benefit from the inputs invested. The Integrated Child Development Services (ICDS) scheme initiated in 1975 by the Government of India (GOI) in 33 blocks operates today in about 1952 blocks in different states of the country. The ICDS is a multi-sectoral program which delivers a comprehensive package of services to children and their mothers population through village based centres called Anganwadis (AWs). One AW center caters to a population of about 700 and 1000 in tribal and rural areas respectively.

The United States Agency for International Development (USAID) as an independent bilateral donor organisation assisted the Government of India to introduce innovative inputs into the ongoing ICDS program in two assigned districts namely, Panchmahals of Gujarat state and Chandrapur of Maharashtra state in order to enhance the impact of ICDS on the nutritional status and survival of children. The Foods & Nutrition department of M S University, Baroda was commissioned to evaluate the success/impact of the USAID-assisted ICDS model over a six year period (1984-1990) against pre-set project goals.

The features of the USAID Assistance designed to enhance the existing ICDS Scheme were: Priority attention to regularly reaching most pregnant and nursing women and malnourished children under three years of age with supplementary nutrition, health services and nutrition and health education.

Enhanced nutrition and health education using social marketing approaches.

Better trained workers with essential skills primarily through Mobile-In-Service Training.

Improved supervision through reducing the supervision to Anganwadi Worker ratio by half (Panchmahals only).

Improved management information system, monitoring and evaluation.

Establishment of food processing plants to improve the quality of foods distributed for supplementary nutrition.

The goal/sub-goal of the USAID project were:

- 1. An average decline of 25% in the 0-11 months Infant mortality rate and of 33% in the 12-36 months toddler mortality rate in communities within six years after an AW is established.
- An average reduction of 50% in the prevalence of severe malnutrition in children 0-36 months of age and of 35% in severe plus moderate grades of malnutrition in communities within 4 years after an AW is established

Objectives of the Impact Evaluation Survey

- 1. To estimate the coverage of malnourished children 6-36 months and pregnant and nursing women by supplementary feeding and health check-ups.
- 2. To estimate the coverage of children 12 to 72 months of age with Vitamin A prophylaxis.

- 3. To establish the coverage of pregnant women with two doses of tetanus toxoid, 3 months supply of iron and folic acid and delivery by a trained person (dai, female health worker etc.)
- 4. To determine the coverage of mothers of malnourished children and pregnant and lactating women with Nutrition Health Education (NHED)
- 5. To determine the changes in nutritional status and child mortality status every two years in Panchmahals and Chandrapur.
- 6. To measure changes in nutrition knowledge and behaviour.
- 7. To determine the extent of prevention of malnutrition in younger children enrolled for supplementary feeding and/or whose mothers who received NHED.
- 8. To verify the data collected by Management Information Systems.

The impact evaluation was conducted over a 6-year-period from 1984-1990. The data were collected from 3-7 randomly selected AWs in each of the 19 blocks (all 11 blocks in Panchmahals and all 8 blocks in Chandrapur). In all, 93 AWs (51 AWs in Panchmahals and 42 in Chandrapur) were sampled. The entire population was surveyed within an AW area. Details of the surveys conducted are outlined below:

Year	Survey Title	Survey code
1984-85	Baseline	В
1985-87	First Follow-up	F1
1987-88	Second Follow-up	F2
1989-90	Third Follow-up (Final Survey)	F3

Survey was not conducted in the year 1988-89 because of the delay in implementation of USAID inputs by the said state governments.

For the sake of brevity, the above survey codes will be used through the report.

The final round of the survey was conducted in 1989-90, which had been preceded by three years of unprecedented drought for many states in India. The intensity of the drought's effect was more stark in Gujarat state as severe drought conditions prevailed for three consecutive years from 1985 through 1987. Maharashtra suffered from mild drought only in 1987. The impact of the programme must therefore, be viewed keeping in mind the aftermath of the drought on the socio-economic, nutritional and health status of the ICDS communities.

Data were collected on coverage for various services offered under ICDS viz. immunization, health check-ups, nutrition supplementation, iron/folic acid tablets distribution, Vitamin A

prophylaxis and nutrition health education. The impact of these services was evaluated by measuring the nutritional and health status of women and children.

By design, data were collected on ICDS beneficiaries viz. children 0-72 months of age pregnant women and nursing mothers upto 6 months postpartum. The data were collected by medical/non-medical investigators from MS University of Baroda in Panchmahals and by similar type of investigators in Nagpur University and Indira Gandhi Medical College in Chandrapur. The investigators underwent 3 days intensive training before they were sent to the field.

Data cleaning, processing and analysis were done on an IBM Compatible PC/XT at the Department of Foods and Nutrition., Faculty of Home Science, M S University of Baroda. Details of the sampling procedure and other methodological aspects of the evaluation are found in the final report (1991) of USAID Assisted ICDS Impact Evaluation Project.

The present summary report contains the major findings of the final survey (F3) as compared to the findings of the baseline survey (B) after a period of five years. The findings of the F3 will be discussed according to the service components of the ICDS under the following heads:

- 1. Coverage of women and children under health and nutrition services viz. Immunization, health check-ups, Vitamin A and anemia prophylaxis, antenatal and postnatal health services for pregnant and lactating women, supplementary nutrition for children, pregnant and lactating women and nutrition health education for mothers.
- Impact of nutritional and health services on nutritional and health status of women and children viz. infant and toddler mortality, nutritional and health status of children, pregnant and lactating women and nutrition and health knowledge of mothers.
- Nutrition and health knowledge of AWW and her performance at the AW.

Sample size

The population covered was 28,815 and 29,163 in Panchmahals and 29,466 and 29,780 in Chandrapur at B and F3 respectively (Table 1). The proportion of 0-72 months children, pregnant and lactating women was consistent with expected demographic norms.

Demographic and socioeconomic characteristics of the population

The economic status of the population improved in both districts over the five year period that elapsed between B to F3 (Table 2) attributable to the rise in wages and the relief works provided by GOI during the drought. Consequently, there was an increase in the population above the poverty line. The per capita monthly income of the families when corrected for inflation over the five year period exhibited no increase in family income in Panchmahals and of only 28% in Chandrapur. A shift in the major occupation of agriculture to non-agriculture was observed in Panchmahals indicating that farmers were reverting to the relief works, possibly due to their apprehension that the drought may strike again and their subsistance livelihood from agriculture may at anytime be jeopardized. The literacy status of mothers remained almost unchanged from B to F3 in Panchmahals whereas in Chandrapur it showed a slight improvement. A smaller

proportion of mothers worked outside at F3 as compared to B in Panchmahals where as there was no significant change in Chandrapur.

Coverage of children and women for nutrition and health services

Immunization

A significantly more children upto 12 months (Figure 1a) were immunized at F3 than at B in both the districts by mother's recall as well as by AWW's records (Figure 1b). However, recorded data show that 2 to 3 times more children were immunized as against recall data. Similar observations were made in children 11-23 months of age (Figure 1c and 1d). The maximum coverage was for BCG vaccine. The immunization coverage by health records was comparable with that reported by Tandon (1990) and as expected, was higher than the coverage in the non-ICDS blocks (Figure 1e). The Universal Immunization Programme (UIP) which was introduced in 1985/86 in Panchmahals district and 1986/87 in Chandrapur district is largely responsible for this improvement. However, the coverage for immunization remained below the target of 100%, especially in Panchmahals.

Motivation of parents to get their children immunized and educating mothers regarding the danger of the six fatal vaccine-preventable diseases is needed to improve the coverage, and to meet the target of 100% for immunization. In addition, the pollo immunization schedule needs to be reworked as it has been reported that the unprotected newborn period leaves more children susceptible to pollomelitus during the first three months of life.

Health check-ups

Health functionaries like the Auxillary nurse midwife (ANM) are expected to give health check-ups to children 0-72 months of age at least once a month. A significantly higher proportion of all children as well as those who were malnourished received 1 to 3 or more health check-ups in the past three months at F3 as compared to that at B in both districts (Figure 2). This could be attributed to the notable improvement in ANM visits to the Anganwadi (Only in Chandrapur) in the past three months from B to F3 (Figure 3). However no differences were observed between the percentage of younger (0-36 months) and older (37-72 months) children who received health check-ups. Also equal proportion of malnourished and all children received health check-ups. These data indicate that younger/malnourished children did not receive health check-ups on priority basis as expected. The significant improvement in coverage of children for immunization discussed earlier may also be attributed to the increased health check-ups and notable improvement (Figure 3) in ANM visits to the AW (only in Chandrapur) in the past three months form B to F3.

Health functionaries specifically of Panchmahals need to be motivated to make more frequent visits to Anganwadis and priority be given in providing health check-ups to younger/malnourished children.

Vitamin A prophylaxis

The National Vitamin A Prophylaxis programme provides oral mega-doses of vitamin A semi-annually to children 12-72 months of age. A significant improvement from B to F3 in the proportion of children who received mega-doses of vitamin A by both recall and AWW' and health centre records has been observed from B to F3 (Figure 4). The change in the distribution guidelines introduced by the Ministry of Human Resource Development between B and F3 which allows AWWs to distribute vitamin A might have contributed to the improvements observed in coverage for vitamin A. However, only 23% of children in Panchmahals and 41% in Chandrapur had received one or two doses of vitamin A at F3.

Perhaps, proper orientation to the staff concerned, preparation of the community for utilizing the programme effectively, improving nutrition knowledge of mothers and ensuring that Vitamin A supplies meet the requirements, may help in improving the coverage and consequently the Vitamin A status of children.

Participation in supplementary nutrition by children and pregnant/lactating women

Supplementary nutrition is provided by USAID through CARE under the label of PL 480 Title II to malnourished children, pregnant and lactating women (upto 6 months postpartem) at the AW under the ICDS programme. One of the objectives of the USAID-assisted ICDS project was to attain at least 85% participation in supplementary feeding by malnourished children under three years of age and the pregnant and lactating women.

Children: A definite age gradient (Figures 5a and 5b) was evident in the participation of children in supplementary nutrition at the AW with maximum participation of the 'above threes' in both the districts (66% in Panchmahals and 86% in Chandrapur).

Supplementary nutrition at the AW is provided to 6-72 months old children and pregnant/lactating mother for 25 days in a month and 300 days in a year for the most part on-site. On an average children received supplementary nutrition for over 21-22 days at B and 18-19 days at F3 in Panchmahals (Figure 5c) and 19-20 days at B to 20-22 days at F3 in Chandrapur (Figure 5c) by mothers' recall. The attendance (days) for supplementary nutrition between 'under' or 'above threes' did not vary. The recorded data (Figure 5d) were comparable with the recall data for attendance (days) in supplementary nutrition. These data show that the children are not attending the AW for the supplementary nutrition for the number of days they ought to attend in a month. Also equal proportion of malnourished and normal children of 6-36 months of age participated in supplementary nutrition in both districts. The participation by malnourished children 6-36 months fell short of 40% in Panchmahals and 20% in Chandrapur in meeting the project target of 85% (Figure 6).

There is a need for food at the AW to be prioritized first for the 'below threes' rather than to the 'above threes'. Also, mothers need to be motivated to bring or send their children to the AW for supplementary nutrition. Further, it is desirable that the food when cooked is of low viscosity but high nutrient density.

It appears that if children participate in supplementary nutrition then they become available to receive other health services. In the present study a significantly higher percentage of children who participated in supplementary nutrition received health services than those who did not (Table 3a). Also literacy status of mothers appears to affect delivery of nutrition and health services. More children of literate than illiterate mothers participated in supplementary nutrition and received Vitamin A, immunization and health check-ups (Table 3b) in Panchmahals where literacy rates were very low. In contrast, in Chandrapur where literacy rates are much higher this effect was only seen on immunization.

Pregnant/Lactating women : Although participation of pregnant and lactating women in supplementary nutrition improved from B to F3, neither in Panchmahals nor in Chandrapur the participation reached the target of 85% (Figure 7). The gap between the target and the actual participation in supplementary nutrition was larger in Panchmahals than in Chandrapur. The findings thus suggest that the coverage of priority groups with supplementary nutrition was much higher Chandrapur than in Panchmahals.

The average participation of pregnant women in supplementary nutrition was for not more than 3-4 months as against a possible 6-9 months. As per the revised guidelines of the GOI, pregnant women are eligible for the nutritional supplement from the time they know they are pregnant. Therefore, theoretically they could have participated in ICDS services throughout their entire pregnancy period.

The average participation of lactating women in supplementary nutrition during their pregnancy and lactation period, was not more than seven to eight months.

Pregnant and lactating women need to be motivated to come to the AW for nutritional supplement s or alternatively a 'take home' food supplement needs to be introduced.

Home visits by AWW

In addition to four hours of work at the AW, the AWW is expected to make 'home visits' during which she counsels mothers, weighs children, provides health care to malnourished children and encourages increased participation at AW. Malnourished children under three years of age are considered a priority group for home visits as both counselling and Growth Monitoring (GM) are of great importance in this group. In Panchmahals the percentage of malnourished younger (0-36 months) and older (37-72 months) children visited at home by Anganwadi workers atleast once in the past three months increased from 2% to 33% and 6% to 29% respectively from B to F3. In Chandrapur the increase in the percentage of malnourished children who received home visits was from 29% to 49% in 0-36 months old and 29% to 46% in above threes. It was encouraging to note that larger percentage of younger (0-36 months) than older children received home visits at F3. Also in Chandrapur, larger proportion of malnourished than normal children were visited at home (Figure 8). This could in part, be the reflection of

increased supervision and support that the AWW's received from Mukhya Sevikas (MS) (Figure 9). The percentage of children visited at home by AWWs at least once in the past three months, increased from 3% to 35% (0-36 months) and 6% to 30% (36 months) in Panchmahals and 31% to 46% (0-36 months) and 29% to 43% (36 months) in Chandrapur (Figure 9).

Antenatal and postnatal health services for pregnant women

The antenatal and postnatal health care provided to women includes immunization against tetanus (two doses of tetanus toxoid during the second and third trimester at an interval of one month), health check-ups by ANM/LHV/Doctor and a daily supplement of 60 mg elemental iron and 0.5 mg of folic acid for 100 days during second and third trimester of pregnancy under the National Anemia Prophylaxis Programme.

Tetanus Toxoid (TT)

The percentage of lactating women during pregnancy immunized with tetanus toxoid was significantly higher at F3 as compared to at B (Table 4a) in both districts by recall as well as AWW and health records.

Antenatal Health check-ups

The ANM/LHV/Doctor is expected to provide pregnant women with make a minimum of 4 antenatal check-ups per the ICDS guidelines. A small but significant increase was observed in both Panchmahals and Chandrapur districts in the percentage of women who received antenatal check-ups from B to F3 (Table 4a). Since a larger percentage of 'health-check-up-receivers' had received TT and Fe/FA tablets in both districts (Table 4b), it suggests that efforts to improve the frequency of health check-ups would automatically improve the delivery of other antenatal health services.

Thus, stress should be laid on early and regular antenatal check-ups to detect high risk pregnancy for appropriate care and provision of referral services at the AW.

Postnatal Health check-ups

Postnatal health check-ups (Table 4a) both within 10 days and 6 weeks after delivery significantly improved over the five-years-period. However, this component of health services needs to be strengthened as less than of 20% women had received health check-ups within 10 days or 6 weeks after child birth at F3.

Referrals to PHC by AWW

The actual number of children, pregnant and lactating women who were referred to the PHC or hospital in the past month remained less than 2 in both districts (Table 5).

Impact of ICDS services on nutritional and health status of women and children

Infant (IMR) and toddler (TMR) mortality

In Panchmahals, IMR decreased by 9% and TMR (12-36 months) by 35% from B to F3 (Table 6). Likewise in Chandrapur, the decrease in IMR and TMR was 27% and 38% respectively. The decline in IMR in Chandrapur and of TMR in both Chandrapur and Panchmahals met the USAID -assisted ICDS target of 25% decline in IMR and 33% decline in TMR (within six years of an AW being established). The decline in IMR and TMR was attributed to improved coverage of mothers and children for nutrition and health services.

Morbidity status of children

The prevalence of various morbidities (measles, pneumonia, polio, worms and diarrhea) in children did not appreciably decline in Panchmahals; rather it showed an upward trend (Table 7). However, in Chandrapur, significant decreases were observed in the prevalence of all the morbidities.

The decline in various morbidities in Chandrapur was attributed to improved nutritional status and due to better coverage for immunization, health check-ups and increased ANM visits to AWs and possibly due to increased coverage with Vitamin A prophylaxis.

It is suggested that mass deworming be included in the ICDS. AWs may make better use of the simple generic drugs and first aid kits to combat common maladies. In addition, mothers could be educated about the adverse effects of worm infestation on the growth of their children and the importance of diarrhea preventing measures such as observing personal hygiene, maintaining environmental sanitation and providing clean food and water to their children. These measures may further help in curtailing the prevalence of various morbidities.

Nutritional and health status of children

The prevalence of anemia as indicated by signs of pallor, decreased significantly in Panchmahals as well as in Chandrapur (Figure 10). The improvement in the anemic status of children may, again be the result of improvement in health services received by them.

Prevalence of Vitamin A deficiency

Ocular signs of Vitamin A deficiency in children reduced significantly in both districts (Figure 11a). The reduction in Vitamin A signs of children was attributed to significantly higher coverage of children with mega-doses of Vitamin A. This hypothesis is supported by the fact that, of the Vitamin A deficient children while 20% had received one dose and 16% had received two doses, 64% were those who had not received Vitamin A (Figure 11b).

However, the risk factors for nutritional blindness appear to be:

- a) poor nutrition knowledge among mothers;
- b) maternal illiteracy;
- c) practice of feeding children less than 3 times a day (Table 8a); and
- d) prevalence of malnutrition, measles and anemia (Table 8b).

These findings suggest that in addition to the improvement in coverage for Vitamin A prophylaxis, efforts to improve nutrition and health knowledge of mothers and nutritional status of children would further help in reducing the prevalence of Vitamin A deficiency.

Nutritional anthropometry

In Panchmahals as well as in Chandrapur the proportion of children 0-36 months of age (Figure 12a) and 37-72 months of age (Figure 12b) who were severely malnourished (IAP classification, normal : > 80%, First : 71-80%, Second : 61-70%, Third : 51-60%, and Fourth : < 51% and NCHS median wt/age) significantly decreased and that of mildly malnourished increased at F3 as compared to at B. Chandrapur met the project goal of 50% reduction in the prevalence of severe malnutrition in children 0-36 months and nearly met the goal in moderate plus severely malnourished children (within 4 years after an AW is established). The reason for less impact in Panchmahals may have been drought. The decline in malnutrition however was higher in above threes than below threes in both districts. This could be the reflection of higher participation in supplementary nutrition of above threes versus below threes.

Waterlow's (1972) classification of 0-36 months children into normal, wasted, stunted and wasted + stunted categories using a combination of two indicators viz. weight for height and height for age showed an increase in the prevalence of stunting from 28% to 35% and a decrease in that of wasting from 17% to 15% in Panchmahals from B to F3 (Figure 13a). Similar findings were observed in Chandrapur but the increase in the prevalence of stunting was of a smaller magnitude (35% to 41% Vs 28% to 35%) and the decrease in that of wasting was of a higher (11% to 6% Vs 17% to 15%) magnitude as compared to those observed in Panchmahals. The decrease from B to F3 in the prevalence of wasting + stunting was from 10% to 7% in Panchmahals and from 11% to 5% in Chandrapur children. The relatively better nutritional status of Chandrapur versus Panchmahals children may be attributed to their relatively higher coverage for nutrition and health services.

Similar analysis for 37 to 72 months old children (Table 13b) revealed that the prevalence of stunting increased from 40% to 42% while that of wasting decreased from 12% to 10% in Panchmahals from B to F3. In Chandrapur, on the other hand, a smaller proportion of children were stunted at F3 than at B (51% Vs 56%). The decrease in the prevalence of wasting plus stunting was from 10% to 8% in Panchmahals and from 11% to 6% in Chandrapur children. The proportion of children in normal category increased from 38% to 41% in Panchmahals and from 26% to 37% in Chandrapur. These differences in anthropomatry remained even after adjusting for family income, sex, age, birth order, birth interval, maternal literacy and maternal employement status. The scarcity of food for a prolonged period of time in the drought conditions that

had prevailed for more than three years from 1986-88 specifically in Gujarat appear to have affected linear growth in children. These findings suggest that increased participation in supplementary nutrition and the receipt of other health services perhaps helped children to at least maintain their weights.

Table 9a shows a higher proportion of children 0-36 months, who had received health check-ups were in a normal category by wt/age and Ht/age criteria only in Panchmahals. Such effects of health check-ups were not observed in Chadrapur children. Also equal proportion of children were morbid in the past year who received or did not receive health check-ups. Perhaps health check-ups were provided to only morbid children.

The data were also analyzed to evaluate the impact of nutrition and health services on the nutritional status of the children. Table 9b shows that a higher percentage of children who received either health or health plus nutrition services were nutritionally superior as assessed by percent of NCHS median Wt/age, to those who received none of the services.

Mothers knowledge of basic nutrition and health measures strongly influences their child care practices which, in turn, affect the nutritional status of their children, and a positive relationship has been reported between socioeconomic status and the ability of mothers to provide adequate food and primary care to their children. Therefore, an analysis of covariance was used to determine the effect of mothers nutritional knowledge on nutritional status of their children. Table 10 shows that in both districts the nutrition knowledge score of mothers categorized into 0 to 4 and above (maximum score of 9) significantly associated with the nutritional status of children although income and literacy status of mothers were significant intervening variables.

The above findings demonstrate that the improvement in nutritional status of the Chandrapur children was better than that of Panchmahal's children. This was attributed to the better coverage of health and nutrition services in Chandrapur as compared to those in Panchmahals. Also, nutrition knowledge of mothers was found to be positively related to nutritional status of their children. It is suggested that nutrition and health knowledge of mothers be improved by strengthening the NHED component of the ICDS.

Nutritional and health status of pregnant and lactating women

Prevalence of anemia in pregnant women

The increased coverage for iron/folic acid tablets distribution and increase in number of tablets received were reflected in a better hemoglobin (Hb) profile of pregnant women at F3 as compared to that at B in Panchmahals (Figure 14). At F3 56% of pregnant women had an Hb level above 11g/dl as compared to less than 3% at B. In Chandrapur, the Hb level of 29% pregnant women was above 11 g/dl at F3 (Figure 14); Ohemoglobin data were not available for B.

Risk status by anthropometry in pregnancy

Risk status which identifies pregnant women more likely to have difficult deliveries and give birth to low birth weight babies is used by health functionaries to select women to whom to provide antenatal health services and referal for special care. Amongst various indicators maternal weight and height are commonly used to determine the risk status of pregnant women. The proportion of women at risk by height criteria, declined by 13% in Panchmahals and 26% in Chandrapur (Figure 15). But by the criteria of weight, a significantly higher proportion of women upto 20th week of gestation were at risk at F3 than at B in Panchmahals. In Chandrapur on the other hand, a significantly smaller proportion of women upto 20th weeks of gestation were at risk at F3 than at B. Beyond 20th weeks of gestation, no significant differences were observed in the proportion of risk at women between F3 and B in both the districts.

The nutritional status of the women had not improved appreciably from B to F3. Efforts should be made by the AWW to motivate pregnant women so that they attend the AW for a longer duration in their pregnancy period, which in turn, will help to improve their nutritional status. Measures should also be introduced to improve the nutritional status of women prior to pregnancy, especially during adolescence.

Delivery assistance received by lactating women

Figure 16 shows that the percentage of lactating women who were assisted by trained dais and doctors at birth increased over the five year period from B to F3 in both Panchmahals (19% to 40%) and Chandrapur (49% to 56%) districts.

AWWs' characteristics and performance

NHED sessions held by the AWW and mother's attendance

One of the ICDS services is to provide nutrition and health knowledge to mothers through monthly sessions held by AWW. In Panchmahals, sessions were held once in two months and in Chandrapur, once a month at F3 (Figure 17). However, in both the districts 10% or fewer mothers attended the nutrition health education sessions. Also, a lower percentage of mothers attended the sessions when the sessions were held once a month than once in two months. Thus, the findings suggest that less frequently held sessions tend to attract more mothers.

Nutrition and health knowledge of AWWs and mothers

Nutrition knowledge of AWWs and mothers of 0-72 months old children was evaluated on a set of 7 and 9 nutrition knowledge questions respectively. A score of one was given to each valid response. The nutrition knowledge score being an aggregate of all responses. Figure 18 shows that the AWW had adequate nutrition knowledge in both the districts attributable to the Mobile-In-Service Training and nutrition and health education conducted by training sessions by

CP Trust and CHETNA respectively from 1987 to 1989. Although the nutrition knowledge of AWWs was sound, it did not percolate to the mothers.

These findings indicate that the knowledge of AWW is not being transferred to the mothers. It may be that mothers do not attend NHED sessions by choice or they do not have time to attend the sessions as they may have to forego the entire day's work which means losing earnings of that day. It may also be that the AWWs lack counselling skills which aid in imparting knowledge. Efforts must be made to improve counselling skills of AWW's through NHED component of ICDS scheme. Also, mothers need to be motivated to receive the counselling.

AWWs and mothers' knowledge of Oral Rehydration Therapy (ORT) in diarrhea management

All the AWWs but fewer than 30% of the mothers were aware of ORT at F3 (Table 11). The knowledge of AWWs to correctly prepare ORS improved significantly from B to F3 but, no appreciable changes were observed in the ability of mothers to prepare ORS. Fewer than 40% mothers could prepare ORS correctly.

Growth Chart knowledge of AWWs and mothers

One of the activities of the AWW is to monitor the growth of children 0-72 months of age by monthly weighing. The AWW also maintains Growth Charts (GC) for each child at her AW. Although nearly 100% of AWWs were knowledgeable about growth charts, this did not benefit mothers as only 3% of mothers in Panchmahals and 2% in Chandrapur could correctly interpret 2 of the 3 charts shown to them (Figure 19).

Perhaps AWWs need specific training to increase their counselling skills. Also, mothers need to be motivated and prepared to receive the counselling. It should be stressed that training to mothers in preparation of ORS needs to be continually re-inforced and one-time training is insufficient.

Growth Monitoring by AWW

A significant improvement in the Growth Monitoring (GM) or weighing activity of the AWW was observed from B to F3 (Figure 20). This was revealed by the significant increase in the proportion of children with an up-to-date, accurately plotted GC (accuracy was determined by comparing the children's most recent weight recorded on Growth Charts with those taken by the investigators) in both the districts. Also, the proportion of children whose GC were maintained (both accurately and inaccurately) increased from 10% to 46% in Panchmahals and 2% to 63% in Chandrapur.

Although the growth monitoring activity by AWW was being performed more efficiently at F3 than at B, the knowledge of mothers regarding it remained poor, thereby, limiting its beneficial impact on the nutritional status of the children.

liliteracy among rural and tribal mothers appears to be one of the greatest obstacles for growth monitoring to be used as an educational tool to counsel mothers regarding the present nutritional status of the child and steps required for its improvement. It may also be that the functionaries are not adequately trained to act as facilitators who can involve themselves in problem-solving dialogue and not just be the purveyor of messages.

Determinants of AWWs' performance

AWW's performance was evaluated in terms of the coverage of children for nutrition and health services in relation to her education level, knowledge of nutrition and guidance received by her from ANM. It appears that three factors viz. the nutrition and health knowledge of the AWW, the ANM's regular visits to the AW and the educational level of the AWW alone or in combination determined the AWW's performance in terms of coverage of the target child population for various nutrition and health services. The coverage was two-to-four fold higher if the AWW had an adequate nutrition knowledge or was receiving regular guidance from the ANM (Table 12). The performance of the AWW further improved if along with adequate nutrition and health knowledge, her education level was above high school. The coverage of the child population for various nutrition and health services increased from two to twenty four fold if all these three factors were satisfied.

It is suggested that the AWW must receive regular guidance from the Mukhya Sevika (MS)/ANM. She should have adequate nutrition and health knowledge and her education level should be of high school or above.

The AWW, ANM, Village Health Guide VHG, MS, Child Development Program Officer (CDPO) and District Program Officer DPO should work in concert in order to provide multiple services of health, nutrition and education at the AW. Refresher courses for all these functionaries are therefore, essential to improve their work efficiency. In Panchmahals because of the lower AWW to MS ratio (10.4:1), the AWWs received more supervisory assistance than the AWWs in Chandrapur where the ratio stood at 18.0:1 as of March 1990. There seems to be a considerable need for further improvements in the training programme. There should be uniformity in methodologies of training and the material used during training. The AWWs should be provided with the same materials to be used at the AWs as was used during their training programme. Refreshers, orientation courses and in-service training especially in the areas where AWWs, with their minimal educational qualification, feel less confident, will surely improve the efficacy of services delivered at the AW.

Data presented in this summary and in the detailed final report can be used to verify the monthly progress report data from the CDPO, presented in the ICDS Management Information Systems.

Table 1	
Demographic break-up of the	population

		Panchmahals			Chandrapur			
Characteristics	В		F	3	E	5	F	3
	N	%	N	%	N	%	N	%
Total population	28815		29163		29466		29780	
Children 0-72 months	5045	17.5	4923	16.9	4343	14.7	4301	14.4
Pregnant women	294	1.0	380	1.3	352	1.2	321	1.1
Lactating women	567	2.0	515	1.8	490	1.7	413	1.4

Demographic norms :

Children 0-72 months : 17% of total population

Pregnant and Lactating women : 2% of total population

	Panchr	nahals	Chand	Irapur
Characteristics	В	F3	В	F3
Per-capita average monthly income (Rs)	62	88 (61)	65	120 (83)
Above poverty line (%)	28	42	30	68
Occupation				
Agriculture	59	35	39	37
Non-agricultural	14	22	25	18
Other	27	43	37	45
Literate mother (%)	7	8	26	30
Mothers work outside (%)	53	32**	69	68

Table 2 Socioeconomic characteristics of the population

() Adjusted to baseline year 1984 = 100

Povery line : B - Rs. 65/- per capita per month (Source Health statistics, Gujarat 1984) F3 -Rs. 68/- per capita per month (Source VII five year plan document Volume II, page 55, 1985-90)

Chi-square (B Vs F3)

[•]P <0.001, ^{••}p < 0.0001



Figure 1a Immunization coverage of children-Recall (0-12 months)







Figure 1c Immunization coverage of children-Recall (12-23 months)

Figure 1d Immunization coverage of children-Record (12-23 months)









Figure 3 ANM visits at Anganwadi in past three months



Baseline

Follow-up3



+ P < 0.0001



Figure 5a Participation in Supplementary nutrition by children (6—72 months)

Figure 5b Participation in Supplementary nutrition by children (6-72 months)





21



Figure 5d Attendance of children (6—72 months) for supplementary nutrition during past one month—record



22

USAID Assisted ICDS Impact Evaluation

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Figure 6

Agewise coverage of children (6-36 months) for supplementary nutrition at Follow-up3



Severely malnourished children : < 60% NCHS median weight for age Moderately malnourished children : 60—70% NCHS median weight for age Normal children : > 70% NCHS median median weight for age

Table 3a

Difference in coverage for health services of 6-72 months old children by participation in supplementary nutrition at Follow-up 3

	Panchmahals				Chandrapur			
	6-36 months		37-72 months		6-36 months		37-72 months	
Services received	Not supp	Supp	Not supp	Supp	Not supp	Supp	Not supp	Supp
	%	%	%	%	%	%	%	%
DPT 3 doses	13	26*	10	26	56	64	49	67*
Polio 3 doses	11	24	9	22*	52	56	44	57
BCG	37	60*	37	60*	80	85	61	80
Measles	16	36	14	31	55	64	37	58
Vit A 2 doses	8	17*	5	16*	11	19	6	21
Check-ups	25	49	18	44	37	40	16	32
GC accurate	13	40*	6	30	43	57	14	34
ORS pack received	4	19*	3	19*	29	43	23	39

Chi-square (Supp Vs not supp)

* P < 0.05

Table 3b

Difference in coverage of 0-72 months old children for nutrition and health services by literacy status of mothers at Follow-up 3

	Panch	mahals	Chandrapur		
Services	Illiterate	Literate	Illiterate	Literate	
	%	%	%	%	
Supplementary nutrition	53	63	73	63	
Vit A prophylaxis	22	47**	39	38	
Immunization	34	64**	76	90**	
Health check-ups received	36	54**	34	36	

Chi-square (Illiterate Vs Literate)

P < 0.05, P < 0.0001





Figure 8

Home visits paid to Malnourished/Normal children (0-72 months) by AWW in past three months





MS visits at Anganwadi in past one year



Table 4a

Health Services received in pregnancy by lactating women's recall and records

Health Services		Panch- mahals		ndra- our
	В	F3	В	F3
Tetanus toxoid received (%)				
Two doses	.			
Recall	7	28**	44	56**
Record	2	10	11	58
Check-ups by ANM\LHV\Doctor (%)				
Antenatally	15	23	47	51
Postnatally (10 days)	4	13	11	17*
Postnatally (6 days)	4	13*	9	15

Chi-square (B Vs F3) *P < 0.05, **P < 0.0001

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Table 4b

Iron folic acid and tetanus toxoid received by pregnant women (third trimester) in relation to antenatal health check-ups at Follow-up3

Health check-ups	Tetanus toxoid	Iron folic acid tablets
	%	%
Panchmahals		
No (n=115)	20	21
Yes (n=38)	79**	79**
Chandrapur		
No (n=70)	53	51
Yes (n=51)	84	77

Chi-square *P < 0.01, **P < 0.0001

27

Table 5

Referrals to PHC by AWW in past one month

Deferrels (Mean)	Panch	Panchmahals		Irapur
Referrais (Mean)	В	F3	В	F3
Child	0.2	1.0	0.7	1.1
Pregnant/Lactating women	0.2	0.2	1.0	0.9

Table 6

Infant (0-12 months) and toddler (12-36 months) mortality rate

Mortality rate in past one	Ρ	Panchmahals		Chandrapur		r
year	В	F3	Decline B to F3 %	в	F3	Decline B to F3 %
Infant mortality rate Deaths/1000 live births	69	63	-9	82	60	-27
Toddler mortality rate Deaths/1000 toddlers	17	11	-35	16	10	-38

IMR - Goal met in Chandrapur

TMR - Goal met in both the districts

Morbidity among 0-72 months old children in past one year					
	Panchm	nahals	Chandrapur		
Morbidity	В	F3	В	F3	
	%	%	%	%	
Measles	17.0	15.5	21.8	14.9	
Pneumonia	6.5	13.5**	12.1	8.8*	
Polio	0.5	0.4	0.5	0.2*	
Worms	12.0	16.4**	19.8	12.8	
Severe diarrhea	37.7	38.2	54.1	36.4	

Table 7

the old children in next ------

Chi-square (B Vs F3)

P < 0.05, P < 0.001

Figure 10

Prevalence of pallor signs in children (0-72 months)



+ P < 0.0001



Vitamin A deficiency signs present .



Figure 11b

Proportion of Vitamin A deficient children in relation to Vitamin A doses received



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29

	Prevalence of Vitamin A deficiency				
Factors	N	%			
Nutrition knowledge score ^b					
> 3 (n=570)	23	4*			
<= 3 (n=4051)	265	7			
Frequency of feeding children					
> 3 times/day (n=1648)	59	4**			
<= 3 times/day (n=2973)	229	8			
Literacy status					
Literate (n=882)	71	8*			
Illiterate (n=3739)	217	6			

Table 8a

30

Risk factors of nutritional blindness^a : Maternal factors at Follow-up 3

Chi-square *P<0.05, **P<0.0001

^adata of Panchmahals and Chandrapur were pooled to avoid skewness.

^bMaximum score=9

Factors		Prevalence of Vitamin A deficiency			
		N	%		
Nutritional sta	tus				
> 60% NCHS median wt/age (n=7028)		518	7*		
<= 60% N	ICHS median wt/age (n=573)	26	5		
Morbidity state	us				
Measles	Yes (n=1149)	100	9*		
	No (n=6444)	435	7		
Diarrhea	Yes (n=2843)	172	6		
	No (n=4750)	363	8		
Anemia	Yes (n=1165)	229	20**		
	No (n=6501)	317	5		

Table 8b Risk factors of nutritional blindness^a : Child factors at Follow-up 3

chi-square *P<0.05, *P < 0.0001

^adata of Panchmahals and Chandrapur were pooled to avoid skewness.

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Figure 12b Nutritional Status by weight for age index IAP classification of 37-72 months old children





31





Figure 13b Nutritional status by combined weight for height and height for age indices—Waterlow of classification of 37—72 months old children



Table 9a

33

Nutrition and health status of 0-36 months old children by health check-ups at Follow-up 3

	Panchmahals				Chandrapur			
Nutrition and health status	Health check-ups		No health check-ups		Health check-ups		No health check-ups	
	N	%	N	%	N	%	N	%
Weight for age								
Malnourished ¹	278	37	535	42	264	37	408	33
Normal	466	63	739	58	457	63	834	67
Height for age								
Malnourished ²	339	46	608	48	404	56	663	53
Normal	405	54	666	52	317	44	579	47
Morbidity present ³	384	52	643	51	381	53	660	53
Morbidity absent	360	48	631	49	340	47	582	47

¹Malnourished : < = 70% NCHS median weight for age

²Malnourished : < = 90% NCHS median weight for age

³Morbid : Having one or more morbidities in past one year- Pneumonia, Measles, Diarrhea, Polio, Worms infestation.

The analysis was done only for those children whose data on health check-up, anthropometry and morbidity were available.

P < 0.05

Table 9b

Effect of various services on nutritional status as assured by percent of NCHS median weight for age of 0-72 months old children at Follo-up3

	Panchi	mahals	Chandrapur				
Services received	Mean weight as percent at median						
	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^a			
Health services : Immunization + Check-ups + Vitamin A	73.9	74.3	74.6	74.6			
Health + Nutritional services : Immunization + Check-ups + Vitamin A + Supplementary							
Nutrition	76.9	79.6	73.4	73.7			
None	71.4	70.9	72.5	71.9			

^aAdjusted for family income and maternal literacy

Kruskal-Wallistest

Chandrapur : Services

* P < 0.05

Table 10

Association between mothers nutrition knowledge and then children's nutritional status as assessed by percent as NCHS median weight for age at Follow-up3

	Panchi	mahals	Chandrapur				
Nutrition knowledge score	Mean weight as percent at median						
	Unadjusted Adjusted ^a		Unadjusted	Adjusted ^a			
1	72.7	70.6	75.7	75.0			
2	73.8	72.9	76.2	76.2*			
3	76.8	78.9**	77.1	77.8			
≥4	78.0	81.2**	78.0	79.4			

^aAdjusted for family income and maternal literacy

Percent prevalence of anemia & coverage for Fe/FA of pregnant women

Kruskal-Wallistest

[•]P < 0.01, [•]P < 0.0001

Figure 14

Mean Fe/FA tablets received by pregnant women







• P < 0.001



Figure 15 Risk status of pregnant women

Figure 16 Delivery assistance received by lactating women



• P < 0.05



Figure 18

Nutrition and health knowledge of mothers and AWWs at Follow-up3



36

Table 11

AWW's and mother's knowledge of Oral Rehydration Therapy (ORT) in diarrhea management

	Panchmahals				Chandrapur			
	AWW		Mother		AWW		Mother	
Knowledge	В	F3	В	F3	В	F3	В	F3
	%	%	%	%	%	%	%	%
Awareness of ORT	100	100	4	15	95	100	4	28
ORS correct preparation	0	65	38	33	34	76*	48	37

Chi-square (B Vs F3) *P<0.001, **P<0.0001

Figure 19

Growth chart knowledge of AWWs and mothers of children (0-72 months)

Baseline

E Follow-up3





Figure 20



Growth monitoring of children by AWW

Table 12

Relative coverage of child population for nutrition and health services by determinants of AWW's performance at Follow-up 3

		D	eterminant	S	
Nutrition and health services	Educa- tion level (>high school)	Nutrition knowledge ^a (>4 score)	ANM visit in past 3 months (>1 visit) (3)	(1)+(2)	(1)+(2)+(3)
Health check-ups in past 3 montsh	1.2	1.3	1.6	2.0	8.3
Participation in supplementary nutrition	0.9	1.9	1.8	1.7	2.0
Vitamin A prophylaxis	0.9	2.0	0.2	2.2	5.6
Growth chart maintenance	0.9	1.7	2.0	2.1	4.6
Immunization	1.1	1.5	4.0	4.5	23.6

Relative coverage was calculated for education level (<=high school vs > high school), nutrition knowledge (<=4 vs > 4 score), ANM visit (<=1 vs > 1 visit), Immunization : BCG + DPT 3 doses + Polio 3 doses and booster dose + Measles

^amaximum 7 scores

38

THE TEAM ON THE USAID ASSISTED ICDS IMPACT EVALUATION PROJECT

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39

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