

OED Précis



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Tamil Nadu and Child Nutrition: A New Assessment

India's Tamil Nadu Integrated Nutrition Project, covering a rural population of more than 13 million, is one of the world's largest projects for nutrition education and targeted supplementary feeding. Though it did not achieve all its goals, it is one of the most successful efforts to date to reduce severe malnutrition. While much has been written about this project, an impact evaluation by OED extends previous analyses in three respects. It reviews progress since 1986, the date of the last large-scale evaluation; it uses a large representative sample of individual beneficiaries for its analysis; and it distinguishes the influences of other determinants of nutrition and health in the area.*

By the second half of the 1970s, India had a variety of public feeding programs. Malnutrition was particularly severe in the state of Tamil Nadu, despite the 25 different nutrition programs operating there which were costing the government about \$9 million annually. Evaluation studies showed that these programs were reaching only a small fraction of the most vulnerable groups:

- Because the programs were not targeted on the basis of nutritional criteria, they did not reach their intended beneficiaries. Children most at risk were not identified.
- Feeding on site tended to replace meals that beneficiaries would otherwise have eaten at home.

- Food taken home was shared with other family members, reducing the impact on beneficiaries.
- The food given was too coarse and bulky for very young children to eat.
- Not enough emphasis was given to nutrition education for mothers, nor to the complementary health care interventions needed to improve their nutritional status.

Project goals, approach

As a result, the government in 1980 launched the Tamil Nadu Integrated Nutrition Project (TINP I). The project sought better targeted and more cost-effective ways to improve maternal and child nutrition and health. It covered the rural areas of those districts with the worst nutritional status—about half the state, and a rural population of about 9 million. Its total cost of \$81 million (originally estimated at \$66 million) was supported by an IDA credit of \$32 million. The credit became effective in 1980 and closed in 1989, two years later than planned.

TINP I sought to improve the nutritional and health status of pre-school children, primarily those 6–36 months old, and pregnant and nursing women. A central tenet of the project was that most malnutrition is the result of inappropriate child care practices, and not of income, famine, or unpreventable health problems, though these factors

can be important. Growth monitoring—monthly weighing of all children 6–36 months old—was a critical element of this strategy. It was the way in which interventions were targeted only to problem cases, thereby controlling program costs. It was also an important educational tool, to explain to mothers why one child was receiving food and another not, and to provide them with objective feedback about how they were caring for their children. Indeed, this project was the first large-scale use of growth monitoring for this purpose.

The project's supplementary feeding component was also innovative. It focused on feeding very young children—who are the most vulnerable to poor nutrition—for relatively brief periods to help them recover their growth, in contrast to the more common approach of prolonged feeding of older children. It relied heavily on local nutrition workers,

**"Impact Evaluation. India: Tamil Nadu Integrated Nutrition Project". Report No. 13783. December 1994, by Ronald G. Ridker. OED impact evaluation reports are available to Bank executive directors and staff from the Internal Documents Unit and from Regional Information Services Centers, and to the public from the Bank's Public Information Center.*

TINP II

The goals of TINP II include reducing severe malnutrition among 0–36 month old children—by 50 percent in new areas and by 35 percent in TINP I areas—and helping to reduce infant mortality to 55 per thousand live births and to halve the incidence of low birth weights.

Design features that distinguish TINP II from TINP I include:

- extension of the target age group to 0–60 months (from 6–36 months in TINP I);
- introduction of a new mother-linked child health card to establish a link between births and TINP enrollment;
- maternal growth monitoring;
- inclusion of non-formal early childhood education;
- expansion of services to more children in different stages of malnutrition;

locally trained, working in conjunction with local women's groups.

An eight-year extension of the project (TINP II) is now in progress, supported by an IDA credit of \$96 million approved in 1991. TINP II seeks to reach most of the remaining rural population in Tamil Nadu. (Box 1.)

Why another study?

Many have doubted the practicality of a nutrition and health program based on growth monitoring and narrowly targeted short-term supplementary feeding. Before TINP, there had been no successful, large, sustained application of these principles. That is why a careful assessment of TINP, based on detailed quantitative documentation of its achievements, is so important.

Before this impact evaluation, such documentation was not available. There have been good qualitative assessments and limited quantitative studies, but none has simultaneously

- more attention to coordination between health and nutrition service delivery.

Most of these changes are positive, resulting directly from lessons learned in TINP I. But two are questionable. The most problematic is the relaxation of entry and exit criteria for supplementary feeding. This modification was apparently a response to the limited success of TINP I in reducing moderate malnutrition.

Though that apparent lack of success may have been due to overly ambitious project goals, it is not clear that the best way to deal with moderate malnutrition is to provide more food—better health services or more intensive education might be more cost effective. Investigating the reasons for the shifts in nutritional status and undertaking operations research to determine the best way to correct the situation (assuming it needed correction) might have been preferable.

used a large representative sample, attempted to control for other factors, and quantitatively investigated questions such as who benefitted and which inputs were crucial to the outcome, in order to understand why this program has succeeded where others have failed.

The impact evaluation focuses mainly on the nutrition and health impacts on children. It relies mainly on statistical analyses of a large representative sample of service records for 1982–90 from some 9,000 community nutrition centers created by the project. Project monitoring data, a field visit, interviews, and a review of the literature were also used.

Findings

Service delivery was partial but highly beneficial

TINP I provided a package of services: nutrition education, primary health care, supplementary on-site feeding of children who were severely malnourished or whose

growth was found to be faltering, education for diarrhea management, administration of Vitamin A, periodic deworming, and supplementary feeding of a limited number of women.

Growth monitoring and nutrition inputs were adequate. Although the enrollment of 6–36 month old children was less than desired (about 77 percent, largely because families in outlying hamlets were difficult to reach), once enrolled, children's monthly weighings were fairly regular and systematic. In 1986, they reached 82 percent of the possible maximum, a figure that compares very favorably with other efforts to use growth monitoring. Other indicators suggest that the procedures laid down—for example for beginning and ending supplementary feeding, providing educational inputs, encouraging community participation, and keeping accurate records—were carefully followed. Sharing of supplemental food with non-participants and substitution for food received at home was probably small.

Health interventions worked much less well. Except for immunization, the project did not achieve its target levels of implementation. Record keeping was less reliable than for the nutrition interventions and procedures were not followed as systematically.

The data were analyzed for three points in time—1982, 1986, and 1990. While all service delivery indicators improved between 1982 and 1986, several of them deteriorated between 1986 and 1990. This peak and decline pattern most likely reflects a decline in performance resulting from low morale, which was created by uncertainties in 1989 and 1990 about whether and in what form the project would continue. Once the follow-on project, TINP II, started, performance appeared to pick up.

Malnutrition levels fell significantly

The data indicate a statistically significant improvement in weight-for-age during 1982–90. They also indicate a steady drop in malnutri-

tion rates for all ages included in the sample. These improvements were continuous over time; they did not follow the peak and decline pattern found in the service delivery indicators.

Much of the change can be attributed to TINP

The nutritional improvements observed can be attributed to TINP if they can be distinguished from the effects of other factors that might also explain the improvements. This was attempted in two stages, first by comparing changes that occurred within TINP districts with changes in non-TINP areas, and second, by considering the differential impact of other programs operating within TINP areas—the one of interest here being the Nutritious Meals Program (NMP).

Unfortunately, there are no pure control areas that could be compared with TINP areas. Instead, the evaluation relied on aggregate data on nutrition status gathered for other purposes in nearby districts, data for TINP areas for the period before TINP was implemented, baseline data available at the start of TINP in each set of blocks

(an administration unit covering a population of about 100,000), and information from other large-scale nutrition interventions.

In addition, an estimate of the effect of income changes on nutrition was made for the TINP areas, using an elasticity measure estimated from other studies. In each case the comparisons are favorable to TINP.

Roughly averaging the figures together suggests that half to three fourths of the decline in malnutrition in TINP areas was due to TINP and other nutrition programs in those areas. Although the NMP operated in all districts in which TINP operated, NMP does not account for much of the observed improvement in nutrition within the 6–36 month age group. One reason is that only children 24 months and older are eligible.

Who participated?

Slightly more boys participated in TINP than girls, the participation of caste children increased from 37 to 42 percent, and the average age at enrollment declined over time. The last two of these findings suggest that

TINP increased its capacity to enroll the most needy.

Who benefitted?

Nutrition status in Tamil Nadu improved across the board, regardless of gender, caste, age groups, or income levels. There is some indication that lower caste individuals and higher income groups benefitted more.

Some inputs contributed more than others to improved nutrition

Multivariate analysis suggests that frequency of weighing, younger age of enrollment, and immunization were statistically significant while deworming and Vitamin A inputs were not.

The project was cost effective

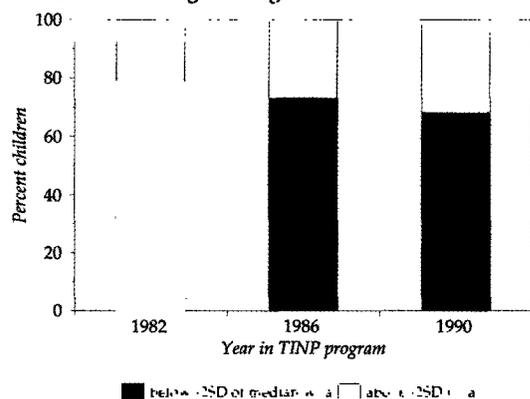
Available evidence suggests that TINP I had lower costs per capita and per beneficiary than nutrition projects that are not narrowly targeted.

The recurrent cost per beneficiary of TINP has been estimated at about \$9.50 a year. This compares favorably with the cost of the nutrition compo-

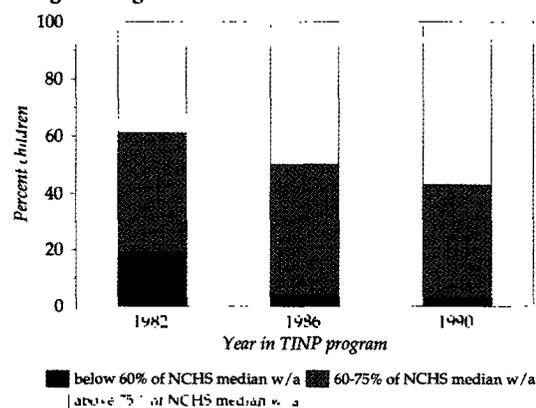
Changes in nutrition profile of children in TINP areas, 1982–90

Figure 1 shows malnutrition prevalence rates as standard deviations from the reference medians of weight-for-age maintained by the Indian National Center for Health Statistics. Figure 2 shows the same data in terms of percentage deviations from these standards. Both figures show that the percentage of children seriously malnourished has declined while the percentage modestly malnourished and normal has increased.

1. Percent children above/below -2 standard deviations (SD) of median weight-for-age (w/a)



2. Percent children above/below 75 percent of median weight-for-age (w/a)



ment of the national Integrated Child Development Services (ICDS) program. TINP's costs per village dweller were a little over half the costs of ICDS (excluding this program's education components) and TINP had roughly twice the effect on severe malnutrition. Comparing program costs per beneficiary (women and children), ICDS cost 25 percent more than TINP for half the benefit. These estimates have been questioned because they were derived from a study that used a small sample, but they are the best available. It should be no surprise that a program that helps only the most needy is cheaper and more effective than one that aims to help all regardless of need.

Is the project sustainable?

Financial sustainability seems assured. Under the TINP II agreement, the government of Tamil Nadu is financing all the operating costs of the program in TINP I areas. These costs were estimated to be less than 5 percent of the Tamil Nadu government's expenditures on nutrition in 1988–89.

Institutional sustainability is more difficult to assess. The project appears to be operating efficiently. The program took less time to achieve full operational status in new areas under TINP II than under TINP I. Moreover, some dimensions of the project are now being operated with more permanent institutional arrangements than before. The main case in point is the establishment of a permanent Communication and Training Center for the project.

The most important question is whether people have permanently changed their behavior. Are women internalizing TINP's messages so that the program can eventually be

phased out without loss of nutritional and health status? Only a few signs are available—knowledge and attitude surveys, extent of breastfeeding, and percentage of children requiring feeding—but they are all moving in favorable directions.

Evidence from a TINP II baseline study shows that mothers who participated in TINP I are significantly more aware of good nutritional and health practices than those who have not participated. Signs of behavioral changes among these mothers include their longer/higher rates of breast feeding and lower percentage of children requiring feeding. It is also encouraging to observe, in a village that was one of the earliest to establish a community nutrition center, that former participants in the program have formed an "adolescent working group".

Of more solid significance would be evidence of improvements in the nutritional and health status of younger siblings of children who were once in the program, and in the status of new mothers and their children. While some field data now exist to explore these possibilities, time and budget constraints precluded such analysis within the scope of this impact evaluation.

Conclusions

The findings of this impact evaluation confirm the practicality of large-scale nutrition and health programs based on growth monitoring and narrowly targeted short-term supplemental feeding. They confirm that:

- Women can be induced to bring their children in for weighing on a regular basis.
- Short-term feeding based on narrow targeting with clear entry and exit rules can be made to work as

planned—keeping costs down, reducing dependence on feeding, and, along with growth monitoring, serving as a powerful educational tool.

- All this can be accomplished with acceptably small leakages and costs.
- Universal feeding is not necessary to achieve nutritional and health gains.
- Most important, the education provided can induce permanent changes in mothers' behavior that positively affect their children's health and nutritional status. This may take more time than originally thought, but once made the progress is unlikely to be reversed.

Importance of processes

The key to TINP's success has been the great care exercised in planning and executing its processes:

- careful selection and training of community nutrition workers;
- detailed work routines;
- heavy emphasis on supportive supervision and on the job training;
- efforts to gain community support;
- emphasis on accurate monitoring; and
- use of the data gathered in trouble-shooting and feedback.

Such attention to detail is not typical in such projects and may reflect the fact that TINP I was owned, developed, and executed by local authorities, rather than superimposed from afar. The areas where TINP I failed—implementation of an effective health program and integration of the nutrition and health components—were precisely those where less attention was paid to process issues.

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