Nutritional interventions through primary health care: impact of the ICDS projects in India

B.N. Tandon

In 1975 the Government of India initiated an integrated approach for the delivery of health care as well as nutrition and education services for deprived populations at the village level and in urban slums through centres, each of which was run by a local part-time female worker (anganwadi) who was paid an honorarium and had a helper. This national programme, known as the Integrated Child Development Services (ICDS), began with 33 projects but, by March 1986, had expanded to 1611 projects covering 23% of the country’s population and representing about 50% of the population in the socioeconomically backward areas. The ICDS can therefore be considered to function as a primary health care programme for preschool children (under 6 years old), pregnant women, and lactating mothers. The present study investigated the impact on the nutritional status of the target population after 3–5 years and after 8 years of ICDS interventions, compared with the nutritional status of non-ICDS (control) groups.

The results showed that the ICDS nutrition intervention programmes achieved better coverage of the target population and led to a significant decline in malnutrition among preschool children in the ICDS population, compared with the non-ICDS groups that received nutrition, health care and education through separate programmes. This example may lead other developing countries to introduce integrated programmes with certain modifications to suit local conditions. International agencies and national governments should strive to bring about the integration of nutritional services with primary health care and development programmes for children because of the good results in terms of child survival and child development.

Undernutrition involving major deficiencies in calories, protein, vitamin A, iron, folic acid and iodine presents one of the most important public health problems in the developing countries of the world. The persons affected are mostly preschool children, pregnant women and lactating mothers. To prevent or minimize the problem, various nutrition intervention programmes have been introduced, from time to time, in different countries. National nutrition programme strategies in India have included the provision of (a) iron and folic acid supplements for the prevention of anaemia (1), (b) vitamin A for the prevention of xerophthalmia (2), (c) iodinated salt for the prevention of iodine-deficiency disorders (3), and (d) food supplements for the prevention of protein-calorie malnutrition (4). This vertical approach of the national nutrition intervention programme was only loosely connected with the primary health care services. Even the nutrition programme in Tamil Nadu sponsored by the World Bank did not provide for health care and preschool education.

In 1975, the Government of India initiated an integrated approach for the delivery of health care as

1 Chairman, Central Technical Committee on Health and Nutrition, Integrated Child Development Services, All India Institute of Medical Sciences, New Delhi-110029, India.

Materials and methods

Selection of ICDS projects

The unit for each ICDS project is a community development block in rural and tribal villages with a population of approximately 100,000 and 50,000,
B.N. Tandon

Table 1: Percentage coverage, with nutritional supplements of non-ICDS populations in 1976 and 1985 (through vertical programmes) and of ICDS populations in 1985 (after 3–5 years and 8 years)

<table>
<thead>
<tr>
<th></th>
<th>ICDS population in 1985</th>
<th>Non-ICDS population in 1976</th>
<th>Non-ICDS population in 1985</th>
<th>After 3–5 years</th>
<th>After 8 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample size</td>
<td>Coverage (%)</td>
<td>Sample size</td>
<td>Coverage (%)</td>
<td>Sample size</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>27 726</td>
<td>10.3</td>
<td>20 605</td>
<td>19.7</td>
<td>22 893</td>
</tr>
<tr>
<td>Iron and folic acid</td>
<td>2 055</td>
<td>18.6</td>
<td>1 464</td>
<td>29.5</td>
<td>1 760</td>
</tr>
<tr>
<td>Supplementary food to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>864</td>
</tr>
<tr>
<td>Preschool children</td>
<td>27 726</td>
<td>25.2</td>
<td>20 605</td>
<td>23.6</td>
<td>22 893</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>2 055</td>
<td>16.8</td>
<td>1 464</td>
<td>16.0</td>
<td>1 760</td>
</tr>
<tr>
<td>Lactating mothers</td>
<td>6 091</td>
<td>14.2</td>
<td>1 938</td>
<td>12.9</td>
<td>2 301</td>
</tr>
</tbody>
</table>

* Highly significant ($P < 0.001$), compared with coverage of the non-ICDS population in 1985.

respectively, and urban slums with about 100,000 population. Proposals for locating a project in rural, tribal and urban areas are invited from the State governments, based on the following criteria:

—areas predominantly inhabited by tribal and/or scheduled caste populations;
—socioeconomically backward areas according to the revenue records;
—drought-prone areas as listed in the state's administration;
—nutritionally deficient areas as assessed by the state or central authorities.

Final selection of the ICDS project area is by the government of India. Thus, throughout the country these projects are located among the poorest populations that are in greatest need of nutrition and primary health care services. Since selection of each project area is based on common criteria, the populations receiving the ICDS services are comparable even when located in different parts of the country.

**Non-ICDS and ICDS populations**

The non-ICDS (or control) populations in the present analysis were the ones selected for the ICDS projects, as described above, and where ICDS staff had been appointed, but before the services had started for the benefit of the population. Generally it took 12–18 months for the selected areas to be served. Of the 33 new ICDS projects selected in 1976 and 192 in 1985, 27 of the former group (distributed in 18 states) and 28 of the latter group (distributed in 16 states) were sampled before the ICDS services were started, thus providing non-ICDS or control data for this study. A total of 171 projects completed 3 to 5 years and 33 completed 8 years; data from 30 in the former group (distributed in 18 states) and 13 in the latter group (distributed in 12 states) were compared with data from the non-ICDS (control) populations.

Sample surveys by teams of investigators from medical colleges close to the ICDS project areas have been carried out at regular intervals from 1976 onwards. Specific data relating to the nutrition services and their impact on nutritional status have been extracted from the detailed surveys for presentation in this paper. They include the percentage coverage of the target population that received daily supplementary food (350 calories plus 10–15 g protein for preschool children, and 500 calories plus 15–20 g protein for pregnant and lactating women), a 6-monthly megadose (200,000 IU) of vitamin A (for preschool children), and daily iron (60 mg) and folic acid (0.5 mg) tablets (for certain periods to pregnant and lactating women). The nutritional status of the children was estimated by weight-for-age classification (6). Other MCH (maternal and child health) services such as immunization, management of diarrhoeal diseases and acute respiratory infections, and family planning are also included in the ICDS package according to the details provided in the national health programmes. The impact of ICDS on immunization (7), morbidity (8), and on infant mortality and birth rate (9) have been described.

**Results**

The supplementary food service coverage among preschool children, pregnant women, and lactating mothers in the non-ICDS population in 1976 was reported to be 25.2%, 16.8%, and 14.2% respectively, while the corresponding figures in a different but comparable non-ICDS population in the 1985 survey were similar (23.6%, 16.0% and 12.9%). Table 1 compares the percentage coverage with nutritional supplements in the ICDS population in 1985 after 3–5 years and after 8 years of implementation with that in a non-ICDS population in the same year and
Nutritional interventions through primary health care

Table 2: Comparison of nutritional status (by weight-for-age estimations) of preschool children in non-ICDS populations in 1976 and 1985 and in ICDS populations in 1985

<table>
<thead>
<tr>
<th>Nutritional status (by weight-for-age)</th>
<th>Non-ICDS population (%)</th>
<th>ICDS population in 1985 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In 1976</td>
<td>In 1985</td>
</tr>
<tr>
<td>Normal and Grade I malnutrition</td>
<td>47.2</td>
<td>69.5*</td>
</tr>
<tr>
<td>Grade II malnutrition</td>
<td>27.0</td>
<td>19.7*</td>
</tr>
<tr>
<td>Grade III and IV malnutrition</td>
<td>19.1</td>
<td>8.4*</td>
</tr>
<tr>
<td>Not recorded</td>
<td>6.7 (1856)*</td>
<td>2.4 (501)</td>
</tr>
<tr>
<td>Sample size</td>
<td>27726</td>
<td>20805</td>
</tr>
</tbody>
</table>

* Highly significant (P < 0.001), compared with the non-ICDS results for 1976.
* Figures in parentheses are the numbers of children not recorded.

in 1976. There was a significant increase in the coverage of all three target groups. However, the distribution of iron and folic acid to pregnant women, and of supplementary food to preschool children and pregnant women had a higher coverage in the groups after 3–5 years compared with the groups after 8 years. Factors such as priority in supplying food and medicines to populations in the newer projects compared to older projects, decline in motivation of the anganwadi workers after some years, and pressure from local administrators on these workers to give priority to family planning as against other services of ICDS need to be studied and may account for the decline in the nutrition intervention services in the older projects.

A study of the nutritional status (by weight-for-age estimations) of the children in the non-ICDS populations showed a drop in severe malnutrition from 19.1% to 8.4% between 1976 and 1985 (Table 2). The status of malnutrition in 1985 in the ICDS populations after 3–5 years and 8 years of implementation is also given in Table 2, which shows a significant decline at least in the severe grades of malnutrition, compared with the non-ICDS group in 1976 and 1985. The non-ICDS population probably also benefited from implementation of family planning and MCH services by the health department during the last decade as shown by the nutritional improvement between 1976 and 1985 among the preschool children.

Discussion

The present study leads to the following conclusions: (1) the ICDS nutrition intervention programmes achieved better coverage of the target population (preschool children, pregnant women and lactating mothers) because the nutrient supplements were given as part of a package of primary health care, preschool, nutrition and health education services, and (2) the integrated nutrition interventions led to a significant decline in malnutrition among preschool children in the ICDS population compared with the non-ICDS groups that received nutrition, health care and education services through separate programmes. Several nutrition and health projects in India such as programmes for supplementary nutrition, control of nutritional anaemia, prevention of vitamin A deficiency, immunization, and diarrhoeal disease control operate independently with poor coordination. The World Bank nutrition project in Tamil Nadu, south India, also did not include the health care and educational components, and so differed from the ICDS programmes. In this paper we have focused on only one of the benefits of the ICDS, i.e., acceleration of nutrition interventions; other benefits have been reflected in the birth rate, morbidity and mortality figures, and immunization coverage.

The data presented here were derived from a national programme that was implemented through the government health, education and welfare infrastructures and has been in operation for more than a decade. The benefits of the ICDS-based nutrition interventions through primary health care for mothers and preschool children, as described here and in other published papers (5, 7–9), may lead other developing countries to introduce integrated programmes with certain modifications to suit local conditions. International agencies and national governments should strive to bring about the integration of nutritional services with primary health care and development programmes for children because of the good results in terms of child survival and child development, compared with the vertical approach to nutrition, diarrhoeal diseases control and immunization. Community participation and the development of self-reliance are important elements in primary health care, but as we have not attempted in this paper to report on the total ICDS package, we have not focused on this aspect. Further, the integration of nutrition services with primary health care is needed at the point of delivery, that is, at the very base of the health
pyramid as has been done in the ICDS system, rather than at the apex which refers to the level of planning and administration.

A recent international conference on nutrition in primary health care has recommended that nutrition interventions should be implemented within the primary health care strategy because epidemiological and operational advantages can yield improved programme effectiveness and efficiency (10). The experience of ICDS confirms that such an approach of integrating nutrition interventions with primary health care is feasible and effective on a long-term basis even in large national programmes.

With regard to the cost factors, the ICDS assembled in one package the different components of vertical programmes such as nutrition, health care services, and education. The ICDS budget therefore, presents under one head all the services in the package which, in different circumstances, would have been separated.

Acknowledgements
I am grateful to the 109 members of faculties in different medical colleges who were Consultants to ICDS; all the members of the Central Technical Committee of the ICDS; the Department of Women and Child Development, Ministry of Human Resource Development, Government of India; and the UNICEF Regional Office in New Delhi for their assistance in this project.

Résumé
Interventions nutritionnelles par le biais des soins de santé primaires: impact des projets ICDS en Inde
En 1975, le Gouvernement indien a adopté une approche intégrée pour la délivrance des soins de santé et des services de nutrition et d’éducation au niveau du village et dans les bidonvilles par le biais de centres destinés aux populations démunies, chaque centre étant tenu par une travailleuse de santé à temps partiel locale (anganwadi), recevant un salaire et aidée d’une assistante. Ce programme national, connu sous le nom d’Integrated Child Development Services (ICDS), a commencé avec 33 projets; en mars 1986, il comptait 1611 projets couvrant 23% de la population du pays et représentant environ 50% de la population socio-économiquement défavorisée. L’ICDS peut par conséquent être considéré comme équivalent à un programme de soins de santé primaires pour les enfants d’âge préscolaire (moins de 6 ans), les femmes enceintes et les mères allaitantes. La présente étude portait sur l’impact du système sur l’état nutritionnel de la population cible au bout de 3 à 5 ans et au bout de 8 ans d’intervention dans le cadre de l’ICDS, par comparaison avec l’état nutritionnel des groupes témoins ne bénéficiant pas de ces services.

Les résultats montrent que, par rapport aux groupes non ICDS ayant reçu des soins nutritionnels, des soins de santé et une éducation pour la santé par le canal de programmes indépendants, les programmes ICDS d’intervention nutritionnelle ont obtenu une meilleure couverture de la population cible et ont conduit à une réduction sensible de la malnutrition chez les enfants d’âge préscolaire. Cet exemple pourrait conduire d’autres pays en développement à adopter des programmes intégrés adaptés aux conditions locales. Les organisations internationales et les pouvoirs publics devraient s’efforcer d’intégrer les services nutritionnels dans les soins de santé primaires et les programmes de développement destinés à l’enfance, compte tenu des bons résultats de cette intégration des points de vue de la survie et du développement des enfants.

References

Reprint No. 4052