

Immunization coverage in India for areas served by the Integrated Child Development Services programme

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The Integrated Child Development Services (ICDS) programme was launched by the Indian government in October 1975 to provide a package of health, nutrition and informal educational services to mothers and children. In 1988 we studied the impact of ICDS on the immunization coverage of children aged 12–24 months and of mothers of infants in 19 rural, 8 tribal, and 9 urban ICDS projects that had been operational for more than 5 years. Complete coverage with BCG, diphtheria–pertussis–tetanus (DPT) and poliomyelitis vaccines was recorded for 65%, 63%, and 64% of children, respectively, in the ICDS population. By comparison, the coverage in the non-ICDS group was only 22% for BCG, 28% for DPT, and 27% for poliomyelitis. Complete immunization with tetanus toxoid was recorded for 68% of the mothers in the ICDS group and for 40% in the non-ICDS group. Coverage was greater in the urban and lower in the tribal projects. Scheduled castes, scheduled tribes, backward communities, and minorities (groups that have a high priority for social services) had immunization coverages in ICDS projects that were similar to those of high castes.

Introduction

The Integrated Child Development Services (ICDS) programme, which operates throughout India, was set up by the government to cater for the needs of preschool children and their mothers. Its most important characteristics are outlined below (1, 2).

- The beneficiaries include children aged less than 6 years, pregnant women, and lactating mothers (up to 6 months' lactation). This is the most critical population for child survival and human resource development.

- The services offered include three essential components for development (nutrition, health, and education), which are provided as a single package to each beneficiary.

- A total of 75–80% of the population of India lives in villages. The ICDS services are therefore delivered at local village centres (*anganwadi* centres) to facilitate maximum use by the beneficiaries.

- Local village women (1 per 1000 population) have been appointed as *anganwadi* workers by ICDS and act as care providers to the mothers and children in their villages.

- A systematic two-limb organization, one for health and nutrition and the other for welfare and education, has been developed from the village level up to that of the state and central government capitals to implement ICDS.

- ICDS started in 1975 with 33 projects and by March 1990 had expanded to 2525. Each project covered 100 000 beneficiaries.

The national immunization programme is implemented by the Ministry of Health and Family Welfare, according to the following schedules:

- BCG vaccine (one dose, at birth or up to 6 weeks of age);

- diphtheria–pertussis–tetanus (DPT) vaccine (three doses, the first at 6 weeks of age, followed by two additional doses at 1-month intervals);

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- poliomyelitis vaccine (four doses, the first at birth, followed by additional doses at 6-weeks and then at 1-month intervals along with DPT);
- measles vaccine (one dose, at 9–12 months of age); and
- tetanus toxoid (two doses, at 16–36 weeks after conception for the first pregnancy; for subsequent pregnancies, only a booster dose is administered).

The health infrastructure in rural areas uses the ICDS *anganwadi* centres and the *anganwadi* workers to immunize children and pregnant women and to perform other primary health care activities. The *anganwadi* workers carry out the following immunization duties:

- list the infants and pregnant women to be immunized;
- motivate the family members to accept immunization of infants and pregnant women;
- assist the health teams to perform the immunizations; and
- follow up and carry out first aid management of any minor side-effects resulting from the immunizations.

This article presents the results of a recent study of the impact of ICDS on immunization coverage of children aged 12–24 months and of the mothers of infants. Analysed also was the immunization coverage of scheduled castes,^a scheduled tribes,^b backward communities, and minorities—the priority group for social services in India.

Method

A two-stage, random sample approach was used. In the first stage, 19 rural, 8 tribal and 9 urban “experimental” projects that had completed ≥ 5 years of ICDS operation were selected as a 10% sample of the total number of projects in each of these areas. In the second stage, 6% of the population from each of the selected projects was identified by a stratified random sampling design and served as the experimental group. Eighteen newly sanctioned ICDS projects (9 rural, 8 tribal, and 1 urban) were selected as controls.

^a Scheduled castes, generally known as “depressed classes”, are socially, educationally, and economically backward classes arising out of the historical custom of untouchability.

^b The following are the main characteristics of all scheduled tribes: tribal origin; primitive way of life; living in remote and less easily accessible areas; and general backwardness.

The experimental population provided a sample of 5367 children aged 12–24 months and 5111 mothers of the infants. The control population consisted of 2018 children and 1890 mothers.

Results

The BCG, DPT and poliomyelitis immunization activities covered 65%, 63%, and 64%, respectively, of children in the experimental population. Complete immunization of children with all three vaccines was recorded for 57% of the experimental group. The control group had lower coverage: 22% for BCG, 28% for DPT; and 27% for poliomyelitis. Complete immunization with tetanus toxoid was reported for 68% of the mothers in the experimental group and 40% in the control group (Table 1).

The immunization coverages for the control and experimental groups for rural, tribal and urban projects are presented in Table 2. It should be noted that in the experimental group the proportions of children and mothers who were completely immunized were 71% and 74%, respectively, in the urban, 55% and 73% in the rural, and 39% and 43% in the tribal projects. The coverage for each vaccine in the experimental group was significantly greater than that for the controls in rural, tribal and urban areas.

Immunization coverage of boys and girls separately is shown in Table 3. Complete immunization with all doses of BCG, DPT, and poliomyelitis vaccines was registered for 51% of the boys and for 49% of the girls. A similar pattern was noted for each vaccine individually.

The immunization coverage among the scheduled castes, scheduled tribes, backward communities, and minorities is presented in Table 4. These priority

Table 1: Comparison of the immunization coverage of children (12–24 months of age) and mothers in the experimental and control groups

	Experimental group	Control group
<i>% coverage</i>		
BCG	65	22
DPT (3 doses) ^a	63	28
Polio (3 doses)	64	27
Complete immunization	57	N.R. ^b
Tetanus toxoid (2 doses)	68	40
<i>Population studied</i>		
No. of children	5367	2018
No. of mothers	5111	1890

^a DPT = diphtheria–pertussis–tetanus.

^b N.R. = not recorded.

Table 2: Immunization coverage in the control and experimental groups for rural, tribal and urban projects

	Rural		Tribal		Urban	
	Experimental	Control	Experimental	Control	Experimental	Control
<i>% coverage</i>						
BCG	62	28	48	13	81	7
DPT (3 doses) ^a	63	37	44	17	75	0.8
Polio (3 doses)	66	34	43	17	75	2
Complete immunization	55	N.R. ^b	39	N.R.	71	N.R.
Tetanus toxoid (2 doses)	73	43	43	35	74	43
<i>Population studied</i>						
No. of children	2567	1241	1085	651	1715	126
No. of mothers	2632	1101	857	703	1622	86

^a DPT = diphtheria–pertussis–tetanus.

^b N.R. = not recorded.

 Table 3: Immunization coverage of children in the experimental group, by sex^a

	% of total coverage		
	Boys (n=2725)	Girls (n=2642)	Combined % coverage (n=5367)
BCG	51	49	65
DPT (3 doses) ^b	52	48	63
Polio (3 doses)	51	49	64
Complete immunization	51	49	57

^a The difference in immunization coverage for male and female children is statistically not significant.

^b DPT = diphtheria–pertussis–tetanus.

groups for social services had immunization coverages in ICDS that were similar to those of higher castes. Scheduled tribes had lower coverages than scheduled castes, backward communities, and min-

orities probably because the scheduled tribes tended to live in small clusters of houses situated in different locations, which made it difficult for outreach workers to cover them.

Several of the projects included in the experimental group had been surveyed in an earlier baseline study when ICDS began. Immunization coverage in these experimental projects after ICDS had been in operation for ≥ 5 years was compared with the baseline immunization status in the same project population. The baseline data were collected for children aged 0–6 years, and therefore also included individuals immunized after 24 months of age. The baseline data are presented in Table 5. The baseline coverage for BCG, DPT (3 doses), and poliomyelitis (3 doses) was 25%, 13% and 24%, respectively; and these levels increased to 65%, 63%, and 64%, respectively, after the ICDS operational period. The tetanus toxoid coverage increased from 2% to 68%. Table 6 depicts this change for the rural, tribal and urban projects.

Table 4: Immunization status of children aged 12–24 months and of mothers in the experimental group, by caste

	Scheduled caste	Scheduled tribe	Backward community	Minorities	Higher caste
<i>% coverage</i>					
BCG	70	49	69	67	71
DPT (3 doses) ^a	66	45	65	69	71
Polio (3 doses)	66	44	66	69	75
Complete immunization	62	40	60	61	62
Tetanus toxoid (2 doses)	67	44	74	81	73
<i>Population studied</i>					
No. of children	1171	1148	861	933	1254
No. of mothers	1103	953	843	862	1350

^a DPT = diphtheria–pertussis–tetanus.

Table 5: Comparison of the immunization coverage in the experimental group of children and mothers with that in the baseline study

	Study group	
	Experimental	Baseline ^a
<i>% coverage</i>		
BCG	65	25
DPT (3 doses) ^b	63	13
Polio (3 doses)	64	24
Tetanus toxoid (2 doses)	68	2
<i>Population studied</i>		
No. of children	5367	15 898
No. of mothers	5111	428

^a Coverage data are for children aged 0–6 years.

^b DPT = diphtheria–pertussis–tetanus.

Discussion

Our findings permit the following inferences to be made about immunization of mothers and children in ICDS projects.

ICDS has played a very successful role in increasing the immunization coverage of mothers and children (Table 1). A total of 57% and 68%, respectively, of children and mothers have been completely immunized. These proportions are significantly greater than those in populations not covered by ICDS. Table 1 shows the coverage data for each vaccine. In the ICDS (experimental) group the coverage, both for children and mothers, was almost twice that in the control group: BCG, 65% and 22%, respectively; DPT (3 doses), 63% and 28%, respectively; poliomyelitis (3 doses), 64% and 27%, respectively; and tetanus toxoid (2 doses), 68% and 40%, respectively. The Universal Immunization Programme (UIP) has stimulated coverage in India;

however, this is variable, ranging from very low (0–16%)^c to very high (94–99%) for different vaccines. In the present study, the controls were selected from seven UIP projects and 11 non-UIP projects. The coverage in the UIP projects varied from zero to 90.3%.

The success of the immunization efforts of ICDS is further illustrated by comparison of the coverage of the children and mothers in the present study with that for the baseline study of the same projects (Table 6). The coverage increased markedly in ICDS projects.

The immunization coverage of scheduled castes, backward communities, and minorities ranged from 60% to 81%. The coverage for the scheduled tribes was at the lower end of this range possibly because of the following reasons:

- such tribes live in small hamlets of a few houses, which are much more difficult to cover with outreach services than the general rural population, whose living conditions are better organized in groups of ≥ 200 houses; and
- the cultural beliefs of the scheduled tribes offer resistance to the concept of immunization.

Despite these limitations, it is encouraging to note that the immunization coverage of the scheduled tribes was close to 50%.

ICDS has significantly increased immunization coverage in India. However, analysis of individual projects indicates that there are extremes, of both good and bad, in every component of ICDS services. This holds true also for immunization coverage. Some of the projects had poor and others excellent coverage, with the overall outcome confirming the

^c Sokhey, J. *Vaccination coverage evaluation survey*. New Delhi, National Immunisation Mission, Ministry of Health and Family Welfare, 1989.

Table 6: Comparison of immunization coverage in the experimental and baseline groups, for rural, tribal, and urban populations

	Rural		Tribal		Urban	
	Experimental	Baseline	Experimental	Baseline	Experimental	Baseline
<i>% coverage</i>						
BCG	62	17	48	10	81	50
DPT (3 doses) ^a	63	1	44	11	75	34
Polio (3 doses)	66	N.R. ^b	43	1	75	35
Tetanus toxoid (2 doses)	73	0	43	0	74	8
<i>Population studied</i>						
No. of children	2567	7582	1085	3602	1715	4714
No. of mothers	2632	278	857	53	1622	97

^a DPT = diphtheria–pertussis–tetanus.

^b N.R. = not recorded.

success in ICDS project areas. With improved management and motivation of staff, the immunization and other activities of ICDS should be capable of further improvement without significant financial inputs. The targets fixed by the Indian government for UIP (3) can undoubtedly be achieved well before the year 2000 by the coordinated efforts of ICDS and the health department. A distinctive feature of ICDS is that it provides a package of health, nutritional and educational services to the target group that is more effective for child survival and development than a vertical approach to immunization.

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Résumé

Couverture vaccinale dans les régions de l'Inde où le programme de services intégrés en faveur du développement de l'enfant est appliqué

Le Programme de services intégrés en faveur du développement de l'enfant (ICDS), lancé par le Gouvernement indien en octobre 1975, concerne les enfants d'âge préscolaire, les femmes enceintes et les femmes allaitantes. Il offre aux bénéficiaires un ensemble de services dans le domaine de la nutrition, de la santé et de l'éducation. Dans chaque village où le programme est appliqué, une habitante, l'agent de santé communautaire (*anganwadi*) a été désignée pour être le principal agent chargé d'assurer l'ensemble des services intégrés en faveur du développement de l'enfant.

La présente étude visait à évaluer l'impact de ces services sur la couverture vaccinale des enfants de 12 à 24 mois et des mères de nourrissons ainsi que pour celle des castes inférieures, des tribus primitives isolées, des communautés moins avancées et des minorités, considérées par le gouvernement comme des groupes prioritaires pour la prestation de services sociaux.

Une méthode de sondage aléatoire en deux étapes a été appliquée. Dans un premier temps, 10% des projets mis en œuvre depuis 5 ans au moins dans le cadre du programme de services intégrés en faveur du développement de l'enfant ont été sélectionnés. Dans un deuxième temps, 6% de la population bénéficiaire ont été recensés à l'aide d'une méthode de sondage stratifié. Au total, 5367 enfants de 12 à 24 mois et 5111

mères de nourrissons ont ainsi été sélectionnés dans le groupe ayant bénéficié des services tandis que 2018 enfants et 1890 mères ont été choisis dans la population de référence.

La couverture des enfants bénéficiaires a atteint 65% pour le vaccin BCG, 63% pour le vaccin contre la diphtérie, le tétanos et la coqueluche (DTC) et 64% pour le vaccin antipoliomyélitique tandis qu'elle était respectivement de 22%, 28% et 27% chez les enfants du groupe témoin. Soixante-huit pour cent des mères du groupe bénéficiaire ont été complètement immunisées par l'anatoxine tétanique contre 40% dans le groupe témoin. Dans l'ensemble, le taux de couverture a été plus élevé parmi les populations urbaines qui ont bénéficié des services et plus faible dans les populations rurales.

La couverture vaccinale des groupes sociaux prioritaires bénéficiaires des services intégrés en faveur du développement de l'enfant a été semblable à celle des castes supérieures. Le taux de couverture des tribus primitives isolées n'a pas été aussi élevé que celui des castes inférieures, des communautés moins avancées et des minorités, sans doute en raison de la dispersion de leurs membres qui vivent en petits groupes très éloignés les uns des autres et sont ainsi plus difficiles à atteindre par le programme et les agents de santé.

Le taux de couverture vaccinale ne présentait pas de différence significative selon le sexe: 51% des garçons ont été complètement immunisés contre 49% des filles.

Le programme de services intégrés en faveur du développement de l'enfant a donc considérablement accru la couverture vaccinale en Inde. Les services de vaccination et d'autres activités menées dans le cadre de ce programme peuvent cependant être encore renforcés sans qu'il soit nécessaire de trouver des fonds supplémentaires, en améliorant la gestion et la formation du personnel. En outre, les infrastructures des services intégrés en faveur du développement de l'enfant peuvent aider le Gouvernement indien à atteindre ses objectifs en matière de vaccination bien avant l'an 2000.

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