

Inadequate coverage of the national vitamin A program to prevent morbidity, mortality, and blindness in preschool children in India

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Abstract



Background: Periodic vitamin A supplementation is a major intervention to reduce child morbidity, mortality, and blindness

Aim: To characterize coverage of the Indian national vitamin A program for preschool children and to identify risk factors for not receiving vitamin A

Setting and Design: India National Family Health Survey, 2005-2006.

Results: Of 23,008 children, aged 12-59 months, 20.2% received a vitamin A capsule within the last 6 months. The prevalence of stunting, severe stunting, underweight, and severe underweight among children who did and did not receive a vitamin A capsule, respectively, was 50.4% vs. 57.7%, 24.6% vs. 32.2%, 43.0% vs. 49.6%, and 16.7% vs. 22.1% (all $P < 0.0001$).

In families with a child who did and did not receive vitamin A, respectively, the proportion of families with a history of neonatal, infant, and under-five child mortality was 5.6% vs. 7.2% ($P = 0.009$), 7.0% vs. 9.4% ($P = 0.0003$), and 8.4% vs. 11.4% ($P < 0.0001$).

Maternal education of ≥ 10 years (Odds Ratio [O.R.] 2.22, 95% Confidence Interval [C.I.] 1.69-2.91), 7-9 years (O.R. 1.99, 95% C.I. 1.57-2.53), 1-6 years (O.R. 1.65, 95% C.I. 1.28-2.13), compared to no formal education, was an important factor in a receipt of a vitamin A capsule.

Conclusion: The vitamin A supplementation program in India has inadequate coverage. Expanded coverage of the national vitamin A capsule program will protect children from nutritional blindness and death and help to reach the Millennium Development Goals for reducing under-five child mortality in India.

Data

Characteristic	Did not receive vitamin A		Received vitamin A		P	
	N	%	n	%		
Age of child, months	12-23	5444	29.5	2052	45.4	<0.0001
	24-35	5479	29.3	1255	28.8	
	36-47	4413	23.8	707	16.4	
	48-59	3213	17.4	445	9.4	
Sex of child	female	8657	46.2	2107	46.4	0.88
	male	9892	53.8	2352	53.4	
Maternal age, years	≤ 22	1211	22.1	314	26.7	<0.0001
	23-26	1721	27.7	470	34.9	
	27-30	1615	25.0	343	21.6	
	≥ 31	1743	25.2	306	18.8	
Maternal education, years	0	2810	54.0	359	28.1	<0.0001
	1-6	1015	15.5	244	21.0	
	7-9	1136	15.0	357	24.5	
	≥ 10	1315	15.5	473	27.3	
Paternal education, years	1-6	990	27.5	231	26.4	0.71
	7-9	1268	32.8	314	31.3	
	≥ 10	1662	39.7	484	42.3	
Number of children in household	1	3871	18.7	1383	28.1	<0.0001
	2	5425	27.8	1560	34.0	
	3	3481	18.9	707	15.6	
	≥ 4	5862	34.6	809	22.3	
Stunting		8896	57.7	1854	50.4	<0.0001
Severe stunting		4764	32.2	871	24.6	<0.0001
Underweight		7364	49.6	1488	43.0	<0.0001
Severe underweight		3156	22.1	574	16.7	<0.0001
Wasting		3046	20.3	706	19.5	0.38
Severe wasting		1204	7.6	276	6.7	0.14
Diarrhea lasting 2 weeks		1687	8.9	426	9.9	0.13
Neonatal death in family		1122	7.2	196	5.6	0.009
Infant death in family		1470	9.4	252	7.0	0.0003
Under-five child death in family		1799	11.4	299	8.4	<0.0001

Table 1
Characteristics of children and families by vitamin A capsule receipt during the last 6 months in India, 2005-2006

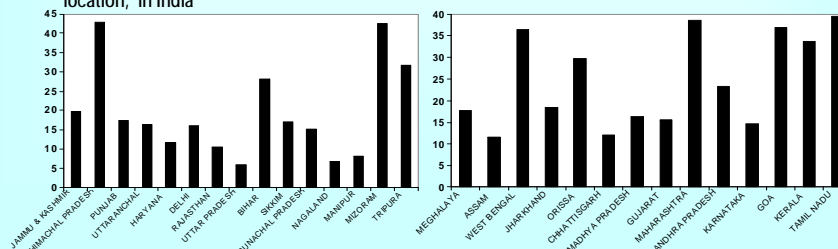
Table 2
Multivariate logistic regression analysis of factors associated with child receipt of a vitamin A capsule in the last six months in India*

Characteristic	O.R.	95% C.I.	P	
Maternal age	≤ 22	1.00	---	
	23-26	1.15	0.92-1.44	0.20
	27-30	0.91	0.68-1.20	0.49
	≥ 31	0.84	0.63-1.12	0.24
Maternal education, years	0	1.00	---	
	1-6	1.65	1.28-2.13	0.0001
	7-9	1.99	1.57-2.53	<0.0001
	≥ 10	2.22	1.69-2.91	<0.0001
Number of children in household	1	1.00	---	
	2	1.24	0.70-1.26	0.18
	3	1.17	0.86-1.57	0.28
	≥ 4	0.94	0.29-1.84	0.69

* Adjusted for all variables in the model and location (state)

Figures 1A and 1B

Proportion of children aged 12-59 who received a vitamin A capsule within the last six months, by location, in India



Results

23,008 children, aged 12-59 months, 4459 (20.2%) received a vitamin A capsule within the last six months. Demographic and other characteristics of families in which the youngest child, 12-59 months, received or did not receive a vitamin A capsule within the last six months is shown in Table 1.



In families where the child did not receive vitamin A, the mothers were older and less educated and the household was more crowded than in families where the child received vitamin A.

Children who missed vitamin A were more likely to be older and to be stunted or severely stunted, and to be underweight or severely underweight, than children who received vitamin A. There were no significant differences in paternal education, child sex, wasting or severe wasting, or having suffered from diarrhea within the last two weeks between children who did or did not receive vitamin A.

A history of neonatal mortality, infant mortality, and under-five child mortality was significantly higher in families where the child did not receive a vitamin A capsule compared to families where the child received a vitamin A capsule in the last six months. The proportion of children who received a vitamin A capsule in the last six months by location is shown in Figures 1a and 1b. The proportion of those who received a capsule ranged from 5.9% in Uttar Pradesh and 6.7% in Nagaland to 42.5% in Mizoram and 42.9% in Himachal Pradesh.

Higher level of maternal education was significantly associated with the child receiving a vitamin A capsule in the last month in a multivariate logistic regression model, adjusting for maternal age, number of children in the family, and location (Table 2).

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