

Online Supplementary Document

Upadhyay et al. Immunization practices in low birth weight infants from rural Haryana, India: Findings from secondary data analysis

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Supplementary table 1.

Determinants of full immunization at one year of age among low birth weight babies in rural Haryana, North India using data on immunization obtained through vaccination cards

Variables	Unadjusted OR (95% CI)	p-value	Adjusted OR [§] (95% CI)	p-value
HOUSEHOLD CHARACTERISTICS				
<i>Quintiles</i>				
1 (Least poor)	Ref		Ref	
2	0.86 (0.73-1.02)	0.079	0.97 (0.82-1.17)	0.813
3	0.61 (0.52-0.73)	<0.001	0.79 (0.65-0.96)*	0.018
4	0.44 (0.36-0.52)	<0.001	0.62 (0.50-0.76)*	<0.001
5 (Poorest)	0.20 (0.16-0.25)	<0.001	0.37 (0.28-0.47)*	<0.001
<i>Religion</i>				
Hindu	Ref		Ref	
Muslim	0.27 (0.22-0.33)	<0.001	0.43 (0.35-0.54)*	<0.001
Others†	0.89 (0.56-1.43)	0.639	1.05 (0.65-1.71)	0.844

<i>Ethnicity</i>				
General	Ref		Ref	
Other Backward Class	0.56 (0.49-0.65)	<0.001	1.07 (0.92-1.24)	0.391
Schedule caste/tribe	0.71 (0.61-0.83)	<0.001	1.11 (0.94-1.31)	0.231
MATERNAL AND PATERNAL CHARACTERISTICS				
<i>Mother's age (in years)</i>				
<20	0.67 (0.55-0.83)	<0.001	0.73 (0.59-0.91)*	0.005
20-25	Ref		Ref	
26-30	1.02 (0.87-1.18)	0.837	1.39 (1.17-1.66)*	<0.001
>30	0.57 (0.42-0.78)	<0.001	1.38 (0.96-1.96)	0.076
<i>Mother's education (Years of schooling)</i>				
Illiterate (0)	Ref		Ref	
Less than primary (1 to <5)	1.33 (0.96-1.84)	0.091	1.09 (0.78-1.53)	0.600
Primary completed and secondary incomplete (5 to <12)	2.27 (1.99-2.59)	<0.001	1.34 (1.16-1.56)*	<0.001
Secondary complete and higher education (≥12)	3.91 (3.24-4.71)	<0.001	1.85 (1.47-2.33)*	<0.001
<i>Father's education (years of schooling)</i>				
Illiterate (0)	Ref			
Less than primary (1 to <5)	1.27 (0.89-1.81)	0.180	1.18 (0.82-1.69)	0.369
Primary completed and secondary incomplete (5 to <12)	2.11 (1.71-2.59)	<0.001	1.20 (0.96-1.50)	0.108
Secondary complete and higher education (≥12)	3.24 (2.59-4.06)	<0.001	1.11 (0.85-1.44)	0.449
BIRTH RELATED CHARACTERISTICS				
<i>Place of delivery</i>				
Home	Ref		Ref	
Government hospital	1.88 (1.64-2.16)	<0.001	1.23 (1.04-1.54)*	0.038
Private hospital	2.02 (1.75-2.34)	<0.001	1.05 (0.83-1.32)	0.687
<i>Personnel conducting delivery [£]</i>				
Skilled	Ref		Ref	
Unskilled	0.45 (0.39-0.51)	<0.001	0.74 (0.59-0.93)*	0.010
<i>No. of living children</i>				
0	Ref		Ref	
1-2	0.96 (0.84-1.07)	0.449	1.00 (0.87-1.14)	0.995
3-4	0.61 (0.47-0.79)	<0.001	0.76 (0.56-1.02)	0.070
≥4	0.24 (0.16-0.36)	<0.001	0.42 (0.27-0.66)*	<0.001
Singleton	Ref		---	---
Multiple	0.97 (0.72-1.32)	0.867		

INFANT CHARACTERISTICS				
<i>Birth weight (in grams)</i>				
2000-2499	Ref		Ref	
<2000	0.95 (0.79-1.16)	0.651	0.96 (0.79-1.17)	0.711
<i>Sex of the baby</i>				
Male	Ref		Ref	
Female	0.87 (0.78-0.98)	0.022	0.87 (0.77-0.97)*	0.023

[§]Variables with p-value <0.20 in the bivariate analysis were included in the multivariable analysis and have been presented in the table, exception being the birth weight which was placed in the multivariable regression model irrespective of the p-values in bivariate analysis as this was considered an essential variable determining delay. Mother's occupation had a p-value of ≥ 0.20 in bivariate analysis and was not included in the multivariable analysis; †others Christian/Sikh/Jain/Parsi/Zoroastrian/Buddhist/neo Buddhist; £ skilled attendant included doctor/nurse/Auxiliary Nurse Midwife/community health worker; unskilled included traditional birth attendant/relative/neighbour ; * statistically significant at $p < 0.05$

Supplementary table 2.

Determinants of delayed vaccination with first dose DPT at age >10 weeks and third dose DPT at age >18 weeks for low birth weight babies in rural Haryana, North India using data on immunization obtained through vaccination cards

Variables	DPT-1 (at >10 weeks after birth)				DPT-3 (at >18 weeks after birth)			
	Unadjusted OR (95% CI)	p- value	Adjusted OR [§] (95% CI)	p- value	Unadjusted OR (95% CI)	p-value	Adjusted OR [§] (95% CI)	p- value
HOUSEHOLD CHARACTERISTICS								
<i>Quintiles</i>								
1 (Least poor)	Ref		Ref		Ref		Ref	
2	1.26 (1.07-1.48)	0.004	1.14 (0.96-1.35)	0.133	1.19 (0.95-1.51)	0.119	1.06 (0.83-1.35)	0.630
3	1.37 (1.16-1.61)	<0.001	1.19 (0.97-1.40)	0.152	1.11 (0.87-1.41)	0.398	0.91 (0.69-1.19)	0.491
4	1.44 (1.22-1.68)	<0.001	1.26 (1.02-1.51)*	0.045	0.99 (0.78-1.26)	0.938	0.78 (0.58-1.08)	0.105
5 (Poorest)	1.64 (1.36-1.97)	<0.001	1.28 (1.05-1.56)*	0.013	0.98 (0.74-1.31)	0.904	0.72 (0.51-1.05)	0.081
<i>Religion</i>								
Hindu	Ref		Ref		Ref			
Muslim	1.53 (1.27-1.86)	<0.001	1.37 (1.12-1.68)*	0.003	1.14 (0.84-1.56)	0.391	0.94 (0.68-1.31)	0.741
Others†	1.17 (0.78-1.76)	0.458	1.12 (0.74-1.70)	0.594	1.90 (0.91-4.01)	0.090	1.73 (0.82-3.68)	0.150
<i>Ethnicity</i>								
General	Ref		Ref		Ref			
Other Backward Class	1.28 (1.13-1.46)	<0.001	1.09 (0.95-1.25)	0.211	1.24 (1.02-1.49)	0.033	1.16 (0.94-1.42)	0.161
Schedule caste/tribe	1.27 (1.10-1.45)	0.001	1.10 (0.94-1.28)	0.222	0.91 (0.75-1.12)	0.384	0.84 (0.68-1.06)	0.141
MATERNAL AND PATERNAL CHARACTERISTICS								
<i>Mother's age (in years)</i>								
<20	1.35 (1.12-1.62)	0.001	1.27 (1.05-1.54)*	0.016	1.24 (0.91-1.68)	0.169	1.16 (0.85-1.59)	0.344
20-25	Ref		Ref		Ref		Ref	
26-30	1.07 (0.93-1.24)	0.343	0.98 (0.84-1.16)	0.876	0.97 (0.78-1.21)	0.824	0.94 (0.74-1.19)	0.608
>30	1.20 (0.91-1.59)	0.197	0.90 (0.64-1.24)	0.511	1.09 (0.69-1.73)	0.684	0.94 (0.57-1.58)	0.840
<i>Mother's education (Years of schooling)</i>								
Illiterate (0)	Ref		Ref		Ref		Ref	
Less than primary (1 to <5)	0.87 (0.65-1.17)	0.354	0.90 (0.67-1.22)	0.497	0.83 (0.52-1.33)	0.435	0.82 (0.51-1.32)	0.416
Primary completed and secondary incomplete (5 to <12)	0.80 (0.71-0.90)	<0.001	0.87 (0.76-0.98)*	0.045	0.94 (0.77-1.14)	0.510	0.87 (0.70-1.08)	0.204

Secondary complete and higher education (≥ 12)	0.48 (0.40-0.58)	<0.001	0.56 (0.45-0.71)*	<0.001	0.62 (0.49-0.79)	<0.001	0.56 (0.41-0.76)*	<0.001
<i>Father's education (years of schooling)</i>								
Illiterate (0)	Ref		Ref		Ref		Ref	
Less than primary (1 to <5)	1.11 (0.81-1.52)	0.521	1.14 (0.82-1.57)	0.436	0.85 (0.49-1.45)	0.545	0.86 (0.50-1.47)	0.575
Primary completed and secondary incomplete (5 to <12)	0.85 (0.71-1.02)	0.076	1.01(0.83-1.22)	0.948	0.76 (0.55-1.06)	0.104	0.76 (0.54-1.07)	0.116
Secondary complete and higher education (≥ 12)	0.72 (0.59-0.88)	0.001	1.11 (0.88-1.39)	0.378	0.69 (0.49-0.96)	0.032	0.76 (0.52-1.12)	0.167
BIRTH RELATED CHARACTERISTICS								
<i>Place of delivery</i>								
Home	Ref		Ref		Ref		Ref	
Government hospital	0.66 (0.58-0.75)	<0.001	0.71 (0.57-0.86)*	0.001	0.76 (0.62-0.92)	0.005	0.77 (0.56-1.06)	0.115
Private hospital	0.85 (0.74-0.96)	0.013	0.97 (0.79-1.20)	0.835	0.83 (0.67-1.02)	0.071	0.84 (0.61-1.16)	0.294
<i>Personnel conducting delivery[†]</i>								
Skilled	Ref		Ref		Ref			
Unskilled	1.34 (1.19-1.51)	<0.001	1.02 (0.83-1.26)	0.828	1.22 (1.01-1.47)	0.041	0.99 (0.71-1.37)	0.946
<i>No. of living children</i>								
0	Ref		Ref		Ref		Ref	
1-2	0.98 (0.88-1.09)	0.731	0.95 (0.84-1.07)	0.399	0.98 (0.83-1.16)	0.860	0.96 (0.80-1.16)	0.701
3-4	1.37 (1.07-1.75)	0.011	1.22 (0.93-1.61)	0.151	1.46 (0.95-2.26)	0.084	1.45 (0.90-2.33)	0.128
≥ 4	1.45 (1.06-1.99)	0.021	1.25 (0.86-1.81)	0.242	1.01 (0.59-1.73)	0.958	0.97 (0.53-1.79)	0.943
Singleton	Ref				Ref			
Multiple	1.05 (0.82-1.36)	0.694	---	---	1.04 (0.71-1.53)	0.827	---	---
INFANT CHARACTERISTICS								
<i>Birth weight (in grams)</i>								
2000-2499	Ref				Ref		Ref	
<2000	1.26 (1.06-1.51)	0.010	1.24 (1.04-1.48)*	0.021	1.10 (0.84-1.45)	0.478	1.07 (0.81-1.42)	0.614
<i>Sex of the baby</i>								
Male	Ref		---	---	Ref		---	---
Female	0.96 (0.86-1.06)	0.398			0.96 (0.81-1.12)	0.593		

§ Variables with p-value <0.20 in the bivariate analysis were included in the multivariable analysis and have been presented in the table, exception being the birth weight which was placed in the multivariable regression model irrespective of the p-values in bivariate analysis as this was considered an essential variable determining delay. Mother's occupation had a p-value of ≥ 0.20 in bivariate analysis and was not included in the multivariable analysis; † skilled attendant included doctor/nurse/Auxiliary Nurse Midwife/community health worker; unskilled included traditional birth attendant/relative/neighbour; * statistically significant at $p < 0.05$

Supplementary table 3.

Determinants of full immunization at one year of age among normal birth weight babies in rural Haryana, North India

Variables	Unadjusted OR (95% CI)	p-value	Adjusted OR [§] (95% CI)	p-value
HOUSEHOLD CHARACTERISTICS				
<i>Quintiles</i>				
1 (Least poor)	Ref		Ref	
2	0.66 (0.62-0.71)	<0.001	0.80 (0.75-0.86)*	<0.001
3	0.46 (0.43-0.49)	<0.001	0.65 (0.59-0.70)*	<0.001
4	0.33 (0.31-0.35)	<0.001	0.56 (0.52-0.61)*	<0.001
5 (Poorest)	0.16 (0.15-0.18)	<0.001	0.38 (0.34-0.42)*	<0.001
<i>Religion</i>				
Hindu	Ref		Ref	
Muslim	0.21 (0.19-0.22)	<0.001	0.39 (0.36-0.42)*	<0.001
Others†	0.83 (0.67-1.03)	0.096	1.03 (0.82-1.31)	0.785
<i>Ethnicity</i>				
General	Ref		Ref	
Other Backward Class	0.47 (0.44-0.50)	<0.001	1.06 (0.98-1.13)	0.061
Schedule caste/tribe	0.73 (0.69-0.78)	<0.001	1.25 (1.16-1.34)*	<0.001
MATERNAL AND PATERNAL CHARACTERISTICS				
<i>Mother's age (in years)</i>				
<20	0.72 (0.66-0.79)	<0.001	0.68 (0.62-0.76)*	<0.001
20-25	Ref		Ref	
26-30	0.99 (0.94-1.05)	0.916	1.50 (1.40-1.61)*	<0.001
>30	0.66 (0.59-0.73)	<0.001	1.78 (1.57-2.04)*	<0.001
<i>Mother's education (Years of schooling)</i>				
Illiterate (0)	Ref		Ref	
Less than primary (1 to <5)	1.71 (1.51-1.94)	<0.001	1.38 (1.21-1.57)*	<0.001
Primary completed and secondary incomplete (5 to <12)	2.92 (2.76-3.08)	<0.001	1.70 (1.59-1.81)*	<0.001
Secondary complete and higher education (≥12)	5.96 (5.53-6.42)	<0.001	2.49 (2.26-2.74)*	<0.001

<i>Father's education (years of schooling)</i>				
Illiterate (0)	Ref			
Less than primary (1 to <5)	1.16 (1.00-1.35)	0.043	1.05 (0.90-1.23)	0.501
Primary completed and secondary incomplete (5 to <12)	2.42 (2.22-2.63)	<0.001	1.30 (1.19-1.43)*	<0.001
Secondary complete and higher education (≥12)	4.39 (4.02-4.81)	<0.001	1.25 (1.12-1.39)*	<0.001
BIRTH RELATED CHARACTERISTICS				
<i>Place of delivery</i>				
Home	Ref		Ref	
Government hospital	1.93 (1.83-2.04)	<0.001	1.17 (1.07-1.28)*	0.001
Private hospital	2.22 (2.10-2.35)	<0.001	0.92 (0.80-1.05)	0.079
<i>Personnel conducting delivery</i> £				
Skilled	Ref		Ref	
Unskilled	0.41 (0.39-0.43)	<0.001	0.70 (0.64-0.77)*	<0.001
<i>No. of living children</i>				
0	Ref		Ref	
1-2	0.72 (0.69-0.76)	<0.001	0.77 (0.73-0.82)*	<0.001
3-4	0.50 (0.46-0.55)	<0.001	0.71 (0.64-0.79)*	<0.001
≥4	0.20 (0.25-0.31)	<0.001	0.56 (0.49-0.65)*	<0.001
Singleton	Ref		Ref	
Multiple	1.84 (1.21-2.79)	0.004	1.48 (0.94-2.33)	0.086
INFANT CHARACTERISTICS				
<i>Sex of the baby</i>				
Male	Ref		Ref	
Female	0.87 (0.83-0.91)	<0.001	0.87 (0.82-0.91)*	<0.001

§Variables with p-value <0.20 in the bivariate analysis were included in the multivariable analysis and have been presented in the table. Mother's occupation had a p-value of ≥0.20 in bivariate analysis and was not included in the multivariable analysis; †others Christian/Sikh/Jain/Parsi/Zoroastrian/Buddhist/neo Buddhist; £ skilled attendant included doctor/nurse/Auxiliary Nurse Midwife/community health worker; unskilled included traditional birth attendant/relative/neighbour; * statistically significant at p<0.05

Supplementary table 4.

Determinants of delayed vaccination with first dose DPT at age >10 weeks and third dose DPT at age >18 weeks for normal birth weight babies in rural Haryana, North India

Variables	DPT-1 (at >10 weeks after birth)				DPT-3 (at >18 weeks after birth)			
	Unadjusted OR (95% CI)	p-value	Adjusted OR ^s (95% CI)	p-value	Unadjusted OR (95% CI)	p-value	Adjusted OR ^s (95% CI)	p-value
HOUSEHOLD CHARACTERISTICS								
<i>Quintiles</i>								
1 (Least poor)	Ref		Ref		Ref		Ref	
2	1.35 (1.26-1.45)	<0.001	1.22 (1.13-1.32)*	<0.001	1.42 (1.28-1.56)	<0.001	1.25 (1.12-1.38)*	<0.001
3	1.48 (1.38-1.59)	<0.001	1.28 (1.18-1.39)*	<0.001	1.39 (1.26-1.55)	<0.001	1.16 (1.03-1.31)*	0.012
4	1.66 (1.55-1.79)	<0.001	1.34 (1.22-1.46)*	<0.001	1.45 (1.29-1.63)	<0.001	1.13 (0.97-1.29)	0.077
5 (Poorest)	2.06 (1.89-2.23)	<0.001	1.48 (1.34-1.65)*	<0.001	1.33 (1.16-1.52)	<0.001	0.98 (0.83-1.16)	0.869
<i>Religion</i>								
Hindu	Ref		Ref		Ref			
Muslim	1.92 (1.78-2.06)	<0.001	1.52 (1.39-1.65)*	<0.001	1.56 (1.36-1.80)	<0.001	1.36 (1.16-1.58)*	<0.001
Others†	1.15 (0.92-1.44)	0.226	1.05 (0.83-1.33)	0.655	1.26 (0.87-1.81)	0.206	1.17 (0.81-1.69)	0.394
<i>Ethnicity</i>								
General	Ref		Ref		Ref			
Other Backward Class	1.38 (1.31-1.46)	<0.001	1.01 (0.95-1.08)	0.677	1.36 (1.25-1.48)	<0.001	1.16 (1.06-1.27)*	0.002
Schedule caste/tribe	1.18 (1.11-1.26)	<0.001	0.94 (0.88-1.02)	0.121	1.21 (1.11-1.33)	<0.001	1.06 (0.95-1.17)	0.290
MATERNAL AND PATERNAL CHARACTERISTICS								
<i>Mother's age (in years)</i>								
<20	1.44 (1.31-1.59)	<0.001	1.42 (1.28-1.57)*	<0.001	1.39 (1.17-1.66)	<0.001	1.43 (1.19-1.71)*	<0.001
20-25	Ref		Ref		Ref		Ref	
26-30	0.92 (0.86-0.97)	0.005	0.81 (0.76-0.86)*	<0.001	0.85 (0.77-0.93)	<0.001	0.77 (0.69-0.85)*	<0.001
>30	1.02 (0.91-1.14)	0.706	0.75 (0.66-0.85)*	<0.001	0.73 (0.61-0.85)	<0.001	0.59 (0.48-0.71)*	<0.001
<i>Mother's education (Years of schooling)</i>								
Illiterate (0)	Ref		Ref		Ref		Ref	

Less than primary (1 to <5)	0.95 (0.84-1.09)	0.501	1.02 (0.88-1.16)	0.812	1.06 (0.85-1.33)	0.568	1.06 (0.85-1.33)	0.592
Primary completed and secondary incomplete (5 to <12)	0.72 (0.68-0.76)	<0.001	0.85 (0.79-0.91)*	<0.001	0.88 (0.81-0.96)	0.009	0.91 (0.82-1.02)	0.066
Secondary complete and higher education (≥12)	0.45 (0.41-0.48)	<0.001	0.60 (0.55-0.67)*	<0.001	0.56 (0.51-0.63)	<0.001	0.67 (0.58-0.76)*	<0.001
<i>Father's education (years of schooling)</i>								
Illiterate (0)	Ref		Ref		Ref		Ref	
Less than primary (1 to <5)	0.95 (0.82-1.09)	0.484	0.96 (0.83-1.11)	0.578	1.29 (0.98-1.70)	0.063	1.26 (0.95-1.65)	0.101
Primary completed and secondary incomplete (5 to <12)	0.73 (0.67-0.79)	<0.001	0.92(0.84-1.03)	0.093	0.95 (0.82-1.10)	0.496	1.03 (0.88-1.21)	0.677
Secondary complete and higher education (≥12)	0.59 (0.53-0.64)	<0.001	1.02 (0.92-1.14)	0.685	0.78 (0.67-0.90)	0.001	1.11(0.92-1.32)	0.249
BIRTH RELATED CHARACTERISTICS								
<i>Place of delivery</i>								
Home	Ref		Ref		Ref		Ref	
Government hospital	0.63 (0.59-0.67)	<0.001	0.80 (0.73-0.88)*	<0.001	0.73 (0.67-0.79)	<0.001	0.80 (0.69-0.93)*	0.003
Private hospital	0.66 (0.63-0.71)	<0.001	0.99 (0.91-1.10)	0.973	0.69 (0.64-0.76)	<0.001	0.86 (0.74-1.04)	0.104
<i>Personnel conducting delivery</i> [†]								
Skilled	Ref		Ref		Ref			
Unskilled	1.63 (1.55-1.72)	<0.001	1.22 (1.11-1.34)*	<0.001	1.39 (1.27-1.52)	<0.001	1.03 (0.88-1.19)	0.736
<i>No. of living children</i>								
0	Ref		Ref		Ref		Ref	
1-2	1.12 (1.06-1.17)	<0.001	1.08 (0.97-1.21)	0.127	1.17 (1.08-1.26)	<0.001	1.21 (1.11-1.32)*	<0.001
3-4	1.22 (1.11-1.34)	<0.001	1.09 (1.04-1.17)*	0.002	1.24 (1.07-1.44)	0.005	1.30 (1.10-1.55)*	0.002
≥4	1.46 (1.31-1.62)	<0.001	1.15 (1.03-1.32)*	0.037	1.18 (0.98-1.41)	0.072	1.29 (1.04-1.60)*	0.023
Singleton	Ref				Ref			
Multiple	0.86 (0.55-1.35)	0.512	---	---	0.59 (0.33-1.05)	0.073	0.68 (0.38-1.21)	0.187
INFANT CHARACTERISTICS								
<i>Sex of the baby</i>								
Male	Ref		Ref		Ref		Ref	
Female	1.15 (1.09-1.20)	<0.001	1.14 (1.08-1.19)*	<0.001	1.12 (1.04-1.20)	0.003	1.12 (1.04-1.21)*	0.003

§ Variables with p-value <0.20 in the bivariate analysis were included in the multivariable analysis and have been presented in the table; Mother's occupation had a p-value of ≥0.20 in bivariate analysis and was not included in the multivariable analysis; † skilled attendant included doctor/nurse/Auxiliary Nurse Midwife/community health worker; unskilled included traditional birth attendant/relative/neighbour; * statistically significant at p<0.05