

## Annex A. Bivariate results of interaction variables

Annex A Table 1. Interaction terms between proximate variables

Variables	S.E of		P- value	Odds ratio Exp(B)
	B	B		
<b>Parity</b>	0.065	0.060	0.279	1.068
<b>Birth interval</b>				
Over 36 months	Reference		0.418	
24 to 36 months	0.476	0.470	0.311	1.610
below 24 months	0.540	0.410	0.188	1.717
<b>Parity by birth interval</b>				
Birth interval over 36 months by parity	Reference		0.857	
Birth interval 24-36 months by parity	0.009	0.074	0.908	1.009
Birth interval below 24 months by parity	0.032	0.068	0.645	1.032
<b>Constant</b>	-2.607	0.373	0.001**	
<b>Parity</b>	0.070	0.025	0.005**	1.072
<b>Breastfeeding status</b>				
Breastfed	Reference			
Never breastfed	2.721	0.677	0.001**	15.196
<b>Parity by breastfeeding status</b>				
Breastfed versus parity	Reference			
Never breastfed by parity	0.140	0.139	0.315	1.150
<b>Constant</b>	-2.359	0.150	0.001**	
<b>Water supply</b>				
Piped water	Reference			
River or surface water	0.825	0.335	0.014*	2.281
<b>Lavatories</b>				
Flush with water/ modern	Reference			
poor latrine/bush or field	0.630	0.367	0.086	1.877
<b>Water supply by Lavatory facilities</b>				
Piped water by modern lavatory	Reference			
River by poor latrine	-0.593	0.429	0.167	0.552
<b>Constant</b>	-2.584	0.259	0.001**	
<b>Water supply</b>				
Piped water	Reference			
River or surface water	-0.945	1.054	0.370	0.389
<b>Housing floor type</b>				
Modern floor	Reference			
rudimentary floor/dirt	0.786	0.421	0.062	2.194
<b>Water supply by housing floor type</b>				
Piped water by modern floor	Reference			
River by dirt floor	1.300	1.078	0.228	3.671
<b>Constant</b>	-2.840	0.364	0.001**	

“Annex A Table 1 continued”

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Water supply</b>				
Piped water	Reference			
River or surface water	2.078	0.559	0.001**	7.985
<b>Place of delivery</b>				
Health center/clinic	Reference			
Home	1.410	0.496	0.004**	4.097
<b>Water supply by place of delivery</b>				
Piped water by clinic	Reference			
River by home	-1.902	0.598	0.001**	0.149
<b>Constant</b>	-3.330	0.453	0.001**	
<b>Water supply</b>				
Piped water	Reference			
River or surface water	0.622	0.216	0.004**	1.862
<b>Breastfeeding</b>				
Breastfed	Reference			
Never breastfed	3.094	0.659	0.001**	22.074
<b>Water supply by breastfeeding</b>				
Piped water by breastfed	Reference			
River versus by breastfed	0.345	0.749	0.646	1.411
<b>Constant</b>	-2.535	0.204	0.001**	
<b>Housing floor type</b>				
Modern floor	Reference			
Rudimentary/ dirt	0.980	0.407	0.016*	2.665
<b>Lavatories</b>				
Flush with water/ modern	Reference			
poor latrine/bush or field	-0.864	1.058	0.415	0.422
<b>Floor type by Lavatory facilities</b>				
modern floor by modern lavatory	Reference			
dirt floor by poor latrine	1.030	1.077	0.339	2.802
<b>Constant</b>	-2.861	0.363	0.001**	
<b>Place of delivery</b>				
Health center/clinic	Reference			
Home	0.667	0.392	0.089	1.949
<b>Lavatories</b>				
Flush with water/ modern	Reference			
poor latrine/bush or field	0.675	0.511	0.187	1.964
<b>place of delivery by lavatory facilities</b>				
Clinic by modern lavatory	Reference			
Home by poor latrine	-0.436	0.549	0.427	0.647
<b>Constant</b>	-2.639	0.345	0.001**	

“Annex A Table 1 continued”

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Breastfeeding</b>				
Breastfed	Reference			
Never breastfed	3.334	0.620	0.001**	28.045
<b>Lavatories</b>				
Flush with water/ modern poor latrine/bush or field	Reference			
	0.498	0.199	0.012*	1.645
<b>Breastfeeding by lavatory facilities</b>				
Breastfed by modern lavatory	Reference			
Never breastfed by poor latrine	0.045	0.716	0.950	1.046
<b>Constant</b>	-2.418	0.184	0.001**	
<b>Housing floor type</b>				
Modern floor	Reference			
Rudimentary/ dirt	1.518	0.650	0.020*	4.562
<b>Place of delivery</b>				
Health center/clinic	Reference			
Home	0.671	0.720	0.351	1.956
<b>Floor type by place of delivery</b>				
Modern floor by clinic	Reference			
dirt floor by never home	-0.515	0.778	0.507	0.597
<b>Constant</b>	-2.539	0.245	0.001**	
<b>Housing floor type</b>				
Modern floor	Reference			
Rudimentary/ dirt	1.474	0.421	0.001**	4.367
<b>Breastfeeding</b>				
Breastfed	Reference			
never breastfed	3.108	0.869	0.001**	22.374
<b>Floor type by breastfeeding</b>				
Modern floor by breastfed	Reference			
Home versus by breastfed	0.423	0.938	0.652	1.526
<b>Constant</b>	-3.396	0.415	0.001**	0.034
<b>Breastfeeding</b>				
Breastfed	Reference			
Never breastfed	3.040	0.722	0.001**	20.901
<b>Birth interval</b>				
Over 36 months	Reference		0.021*	
24 to 36 months	0.460	0.188	0.015*	1.584
below 24 months	0.463	0.179	0.010*	1.589
<b>breastfeeding by birth interval</b>				
Birth interval over 36 months by breastfed	Reference		0.895	
Birth interval 24-36 months by never breastfed	0.182	0.888	0.838	1.199
Birth interval below 24 months by never breastfed	0.384	0.857	0.654	1.469
<b>Constant</b>	-2.347	0.147	0.001*	

Annex A Table 2 Interaction terms between socioeconomic variables

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Place of residence</b>				
Urban	Reference			
Rural	0.221	0.273	0.419	1.247
<b>Place of work</b>				
within home	Reference			
Far away from home	-0.048	0.362	0.895	0.953
<b>Place of residence by place of work</b>				
Urban area by within home	Reference			
Rural area by far away from home	0.437	0.388	0.260	1.549
<b>Constant</b>	-2.203	0.248	0.001**	
<b>Place of residence</b>				
Urban	Reference			
Rural	1.783	0.854	0.037*	5.950
<b>Mother's Education level</b>				
Secondary/higher	Reference		0.001**	
Elementary	0.586	0.740	0.429	1.796
No education	2.005	0.620	0.001**	7.429
<b>Place of residence by education</b>				
urban by secondary/higher	Reference		0.018*	
rural by elementary	-0.876	1.000	0.381	0.416
rural by no education	-1.986	0.884	0.025*	0.137
<b>Constant</b>	-3.518	0.581	0.001**	
<b>Place of residence</b>				
Urban	Reference			
Rural	0.304	0.269	0.258	1.355
<b>Preference of child sex</b>				
Female	Reference			
Male	0.093	0.362	0.798	1.097
<b>Place of residence by preference of child sex</b>				
Urban by female child preference	Reference			
Rural by male preference	0.314	0.387	0.417	1.369
<b>Constant</b>	-2.269	0.248	0.001**	

“Annex A Table 2 continued”

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Preference of child sex</b>				
Female	Reference			
Male	0.623	0.936	0.505	1.865
<b>Regional states</b>				
Addis Ababa	Reference		0.221	
Tigrat	1.543	0.761	0.043*	4.677
Afar	1.016	0.822	0.217	2.762
Amhara	1.206	0.762	0.113	3.340
Oromia	1.152	0.756	0.127	3.164
Somali	0.925	0.821	0.260	2.522
Bemshangul	1.844	0.775	0.017*	6.321
SNNPR	0.911	0.772	0.238	2.486
Gambela	1.244	0.841	0.139	3.469
Harari	0.750	0.888	0.399	2.116
Dire Dawa	1.565	0.798	0.050	4.781
<b>Preference of child sex by regional states</b>				
Female by Addis Ababa	Reference		0.625	
Male by s Tigray	-0.813	1.010	0.421	0.443
Male by Afara	-0.605	1.104	0.584	0.546
Male by Amhara	0.028	0.988	0.978	1.028
Male by Oromia	0.026	0.981	0.979	1.026
Male by Somali	0.087	1.061	0.935	1.091
Male by Bemshangul	-0.834	1.022	0.415	0.434
Male by SNNPR	-0.008	0.999	0.993	0.992
Male by Gambela	-0.040	1.086	0.971	0.961
Male by Harari	-0.520	1.169	0.656	0.594
Male by Dire dawa	-0.640	1.079	0.553	0.528
<b>Constant</b>	-3.213	0.719	0.001**	
<b>Mother's Education level</b>				
Secondary/higher	Reference		0.174	
Elementary	0.022	0.625	0.971	1.023
No education	0.594	0.531	0.264	1.811
<b>Place of work</b>				
Within home	Reference			
Far away from home	-1.010	0.880	0.251	0.364
<b>Education by place of work</b>				
secondary/higher by home	Reference		0.292	
Elementary by far away from home	1.370	0.985	0.164	3.934
no education by far away from home	1.399	0.891	0.116	4.051
<b>Constant</b>	-2.526	0.520	0.001**	

“Annex A Table 2 continued”

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Mother's Education level</b>				
Secondary/higher	Reference		0.022*	
Elementary	0.515	0.675	0.445	1.674
No education	1.201	0.598	0.045*	3.323
<b>Child sex preference</b>				
Female	Reference			
Male	0.199	0.836	0.812	1.220
<b>Education by child sex preference</b>				
secondary/higher by female	Reference		0.899	
Elementary by male	0.340	0.942	0.718	1.405
no education by male	0.151	0.847	0.858	1.163
<b>Constant</b>	-3.088	0.589	0.001**	0.046

Annex A Table 3. Interaction between proximate and socioeconomic variables

Variables	S.E		P- value	Odds ratio
	B	B		Exp(B)
<b>Parity</b>	0.237	0.064	0.001**	1.268
<b>Place of residence</b>				
Urban	Reference			
Rural	1.381	0.406	0.001**	3.980
<b>Parity by place of residence</b>				
parity by urban	Reference			
parity by rural	-0.205	0.069	0.003**	0.815
<b>Constant</b>	-3.293	0.377	0.001**	
<b>Preceding birth interval</b>				
Over 36 months	Reference		0.040*	
24-36 months	0.924	0.479	0.054	2.519
below 24 months	-0.069	0.468	0.882	0.933
<b>Place of residence</b>				
Urban	Reference			
Rural	0.251	0.398	0.528	1.286
<b>Birth interval by place of residence</b>				
Over 36 months by urban	Reference		0.026*	
24-36 months by rural	-0.431	0.515	0.403	0.650
below 24 months by rural	0.762	0.501	0.129	2.142
<b>Constant</b>	-2.453	0.368	0.001**	
<b>Place of residence</b>				
Urban	Reference			
Rural	0.528	0.223	0.018*	1.695
<b>Tetanus immunization</b>				
Immunized	Reference			
not immunized	0.749	0.438	0.087	2.115
<b>Place of residence by immunization</b>				
Urban by immunized	Reference			
rural by not immunized	-0.516	0.459	0.261	0.597
<b>Constant</b>	-2.359	0.205	0.001**	
<b>Place of residence</b>				
Urban	Reference			
Rural	1.796	0.527	0.001**	6.025
<b>Place of delivery</b>				
Health center/clinic	Reference			
Home	1.227	0.438	0.005**	3.409
<b>Place of residence by place of delivery</b>				
Urban by clinic	Reference			
rural by home	-1.731	0.571	0.002**	0.177
<b>Constant</b>	-3.049	0.386	0.001**	

“Annex A Table 3 continued”

Variables	B	S.E of B	P- value	Odds ratio Exp(B)
<b>Place of residence</b>				
Urban	Reference			
Rural	0.597	0.220	0.007**	1.817
<b>breastfeeding status</b>				
Breastfed	Reference			
never breastfed	3.105	0.595	0.001**	22.317
<b>Place of residence by breastfeeding</b>				
Urban by breastfed	Reference			
rural by never breastfed	0.402	0.702	0.567	1.495
<b>Constant</b>	-2.518	0.208	0.001**	
<b>Mother's education</b>				
secondary/higher	Reference		0.008**	
Elementary	1.396	1.058	0.187	4.037
no education	2.385	0.961	0.013*	10.856
<b>Parity</b>	0.396	0.229	0.084	1.486
<b>Mother's Education by parity</b>				
Secondary by parity	Reference		0.168	
elementary by parity	-0.253	0.249	0.310	0.777
no education by parity	-0.362	0.231	0.116	0.696
<b>Constant</b>	-4.262	0.949	0.001**	
<b>Mother's education</b>				
secondary/higher	Reference		0.001**	
Elementary	0.768	0.878	0.382	2.155
no education	2.175	0.744	0.003**	8.806
<b>Source of water</b>				
pipd water	Reference			
river/surface water	2.078	0.895	0.020*	7.991
<b>Education by water</b>				
Secondary by pipd	Reference		0.021*	
elementary by river	-0.984	1.058	0.352	0.374
no education by river	-2.082	0.922	0.024*	0.125
<b>Constant</b>	-3.870	0.714	0.001*	
<b>Mother's education</b>				
secondary/higher	Reference		0.002*	
Elementary	0.490	0.743	0.510	1.632
no education	1.712	0.613	0.005*	5.541
<b>Lavatory facility</b>				
flush water/modern toilet	Reference			
poor latrine/bush	1.087	0.841	0.196	2.966
<b>Education by lavatory facility</b>				
Secondary by modern toilet	Reference		0.148	
elementary by poor latrine	-0.233	0.989	0.814	0.792
no education by poor latrine	-1.110	0.865	0.199	0.330
<b>Constant</b>	-3.390	0.584	0.001**	



“Annex A Table 3 continued”

Variables	B	S.E B	p-Value	Odds ratio Exp(B)
<b>Mother's education</b>				
Secondary/higher	Reference		0.362	
Elementary	1.605	1.131	0.156	4.976
no education	1.366	1.130	0.226	3.921
<b>Housing floor</b>				
Modern floor	Reference			
rudimentary/dirt floor	1.772	1.109	0.110	5.881
<b>Education by housing floor</b>				
Secondary by modern floor	Reference		0.405	
elementary by dirt floor	-1.437	1.246	0.249	0.238
no education by dirt floor	-0.634	1.224	0.604	0.530
<b>Constant</b>	-4.170	1.005	0.001*	
<b>Mother's education</b>				
Secondary/higher	Reference		0.085	
Elementary	0.216	1.243	0.862	1.241
no education	1.481	1.024	0.148	4.397
<b>Preceding birth interval</b>				
over 36 months	Reference		0.028*	
24-36 months	2.079	1.155	0.072	7.998
below 24 months	-0.601	1.427	0.674	0.548
<b>Education by birth interval</b>				
Secondary by over 36 months	Reference		0.077	
elementary by 24-36 months	-0.644	1.402	0.646	0.525
elementary by below 24 months	1.744	1.627	0.284	5.719
no education by 24-36 months	-1.640	1.169	0.161	0.194
no education by below 24 months	1.221	1.438	0.396	3.391
<b>Constant</b>	-3.583	1.014	0.001*	
<b>Mother's education</b>				
Secondary/higher	Reference		0.001**	
Elementary	0.477	0.525	0.364	1.611
no education	1.308	0.465	0.005**	3.700
<b>Tetanus immunization</b>				
Immunized	Reference			
not immunized	0.496	1.134	0.662	1.642
<b>Education by immunization</b>				
Secondary by immunized	Reference		0.040*	
elementary by not immunized	0.909	1.231	0.460	2.483
no education by not immunized	-0.353	1.142	0.757	0.703
<b>Constant</b>	-3.061	0.457	0.001**	

“Annex A Table 3 continued”

Variables	B	S.E B	p-value	Odds ratio Exp(B)
<b>Mother's education</b>				
Secondary/higher	Reference		0.019*	
Elementary	0.750	0.926	0.418	2.116
no education	1.936	0.777	0.013*	6.933
<b>place of delivery</b>				
health center/clinic	Reference			
Home	1.077	0.880	0.221	2.937
<b>Education by place of delivery</b>				
Secondary by clinic	Reference		0.343	
Elementary by home	-0.457	1.087	0.674	0.633
no education by home	-1.152	0.937	0.219	0.316
<b>Constant</b>	-3.562	0.710	0.001**	
<b>Mother's education</b>				
secondary/higher	Reference		0.008**	
Elementary	0.609	0.474	0.199	1.838
no education	1.072	0.425	0.012**	2.921
<b>Breastfeeding status</b>				
Breastfed	Reference			
never breastfed	-2.217	9.554	0.816	0.109
<b>Education by breastfeeding status</b>				
Secondary by breastfed	Reference		0.212	
Elementary by never breastfed	4.180	9.600	0.663	65.372
no education by never breastfed	5.857	9.561	0.540	349.565
<b>Constant</b>	-2.977	0.418	0.001**	
<b>Preference of child sex</b>				
Female	Reference			
Male	0.514	0.277	0.064	1.672
<b>Parity</b>	0.080	0.035	0.021*	1.084
<b>Preference of child sex by parity</b>				
Female by parity	Reference			
Male by parity	-0.028	0.047	0.550	0.973
<b>Constant</b>	-2.422	0.208	0.001**	
<b>Preference of child sex</b>				
Female	Reference			
Male	0.533	0.291	0.067	1.704
<b>Preceding birth interval</b>				
Over 36 months	Reference		0.027*	
24-36 months	0.681	0.283	0.016*	1.977
below 36 months	0.691	0.271	0.011*	1.995
<b>Preference of child sex by birth interval</b>				
Female by over 36 months	Reference		0.877	
Male by 24-36 months	-0.179	0.363	0.623	0.836
Male by below 24 months	-0.151	0.346	0.662	0.860
<b>Constant</b>	-2.553	0.232	0.001**	

“Annex A Table 3 continued”

<b>Variables</b>	<b>B</b>	<b>S.E B</b>	<b>p-value</b>	<b>Odds ratio Exp(B)</b>
<b>Preference of child sex</b>				
Female	Reference			
Male	0.382	0.139	0.006**	1.465
<b>breastfeeding status</b>				
Breastfed	Reference			
never breastfed	3.505	0.472	0.001**	33.290
<b>Preference of child sex by breastfeeding status</b>				
female by breastfed	Reference			
male by never breastfed	-0.326	0.623	0.601	0.722
<b>Constant</b>	-2.206	0.105	0.001**	0.110