

SUPPLEMENTAL INFORMATION

Fecal indicator bacteria along multiple environmental transmission pathways (water, hands, food, soil, flies) and subsequent child diarrhea in rural Bangladesh

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Table S1 Bivariate associations between *E. coli* contamination along each pathway and diarrhea (World Health Organization defined). Incidence rate ratio (IRR; prospective analysis) and prevalence ratio (PR; cross-sectional analysis) estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for season, monthly income, mother's education, and study arm. Prospective models also include an offset for child days at risk; n = number of children included in analysis.

			Prospective					Cross-Sectional			
Pathway	Indicator	n	IRR	95% CI		P-value	n	PR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	1757	0.88	0.62	1.25	0.485	1993	1.16	0.94	1.44	0.161
	log MPN <i>E. coli</i>	1757	0.75	0.56	1.00	0.048	1993	1.12	0.98	1.27	0.110
Stored water	% positive <i>E. coli</i>	1703	0.85	0.62	1.19	0.351	1941	0.84	0.66	1.07	0.155
	log MPN <i>E. coli</i>	1703	0.92	0.80	1.07	0.307	1941	0.92	0.82	1.04	0.177
Hands	% positive <i>E. coli</i>	1875	1.51	1.17	1.95	0.002	2130	1.10	0.91	1.34	0.339
	log MPN <i>E. coli</i>	1875	1.23	1.06	1.43	0.008	2130	1.09	0.97	1.21	0.153
Food	% positive <i>E. coli</i>	1731	1.30	0.99	1.70	0.060	1966	1.02	0.83	1.25	0.829
	log MPN <i>E. coli</i>	1731	1.11	0.99	1.25	0.069	1966	1.03	0.94	1.12	0.539
Flies	% positive <i>E. coli</i>	1928	1.16	0.81	1.66	0.410	2185	1.00	0.78	1.28	0.982
	log MPN <i>E. coli</i>	1928	1.07	0.93	1.23	0.359	2185	1.01	0.91	1.11	0.868
Pond	log MPN <i>E. coli</i>	1864	0.97	0.85	1.11	0.703	2113	1.07	0.99	1.17	0.101
Soil	log MPN <i>E. coli</i>	1900	1.01	0.89	1.14	0.864	2153	1.09	1.00	1.19	0.056

Table S2 Bivariate associations between *E. coli* contamination in each pathway and caregiver-defined diarrhea. Incident rate ratio (IRR; prospective analysis) and prevalence ratio (PR; cross-sectional analysis) estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for season, monthly income, mother's education, and study arm. Prospective models also include an offset for child days at risk; n = number of children included in analysis.

Pathway	Indicator	n	Prospective				n	Cross-sectional			
			IRR	95% CI		P-value		PR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	1848	0.84	0.58	1.22	0.365	1991	1.06	0.80	1.41	0.663
	log MPN <i>E. coli</i>	1848	0.82	0.62	1.10	0.190	1991	1.04	0.88	1.25	0.626
Stored water	% positive <i>E. coli</i>	1795	0.87	0.59	1.28	0.476	1939	0.76	0.57	1.03	0.074
	log MPN <i>E. coli</i>	1795	0.98	0.83	1.17	0.850	1939	0.98	0.85	1.12	0.718
Hands	% positive <i>E. coli</i>	1971	1.52	1.12	2.07	0.007	2128	1.14	0.92	1.42	0.243
	log MPN <i>E. coli</i>	1971	1.31	1.11	1.55	0.002	2128	1.05	0.92	1.19	0.482
Food	% positive <i>E. coli</i>	1820	1.16	0.84	1.60	0.365	1964	1.27	0.97	1.66	0.081
	log MPN <i>E. coli</i>	1820	1.10	0.96	1.26	0.161	1964	1.09	0.99	1.21	0.087
Flies	% positive <i>E. coli</i>	2025	0.78	0.51	1.21	0.276	2183	1.48	1.14	1.92	0.003
	log MPN <i>E. coli</i>	2025	0.93	0.77	1.12	0.462	2183	1.15	1.04	1.26	0.005
Pond	log MPN <i>E. coli</i>	1959	0.99	0.85	1.15	0.892	2111	1.11	1.00	1.23	0.058
Soil	log MPN <i>E. coli</i>	1995	1.12	0.97	1.29	0.126	2151	1.16	1.02	1.32	0.023

Table S3 Bivariate associations between *E. coli* contamination along each pathway and bloody stool. Incident rate ratio (IRR; prospective analysis) and prevalence ratio (PR; cross-sectional analysis) estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for season, monthly income, mother's education, and study arm. Prospective models also include an offset for child days at risk; n = number of children included in analysis.

Pathway	Indicator	n	Prospective				n	Cross-Sectional			
			IRR	95% CI		P-value		PR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	1974	0.77	0.39	1.53	0.461	1989	1.20	0.54	2.67	0.657
	log MPN <i>E. coli</i>	1974	0.73	0.46	1.16	0.183	1989	1.09	0.68	1.76	0.713
Stored water	% positive <i>E. coli</i>	1922	1.70	0.80	3.62	0.170	1937	1.05	0.39	2.81	0.924
	log MPN <i>E. coli</i>	1922	1.18	0.89	1.58	0.255	1937	0.86	0.55	1.35	0.520
Hands	% positive <i>E. coli</i>	2111	1.91	1.04	3.51	0.036	2126	0.43	0.17	1.06	0.066
	log MPN <i>E. coli</i>	2111	1.37	0.97	1.94	0.070	2126	0.70	0.34	1.47	0.349
Food	% positive <i>E. coli</i>	1950	2.64	1.17	5.98	0.020	1963	0.40	0.18	0.88	0.023
	log MPN <i>E. coli</i>	1950	1.34	1.07	1.68	0.010	1963	0.75	0.50	1.13	0.167
Flies	% positive <i>E. coli</i>	2166	1.31	0.65	2.62	0.450	2181	0.15	0.02	1.09	0.062
	log MPN <i>E. coli</i>	2166	1.08	0.82	1.44	0.580	2181	0.41	0.14	1.20	0.104
Pond	log MPN <i>E. coli</i>	2094	0.98	0.76	1.25	0.847	2109	1.02	0.75	1.38	0.904
Soil	log MPN <i>E. coli</i>	2135	1.19	0.86	1.65	0.293	2150	0.70	0.52	0.94	0.019

Table S4 Bivariate associations between *E. coli* contamination along each pathway and subsequent negative control outcomes rash and bruise (7-day prevalence) measured a median of 6-days after exposure measurements. Prevalence ratio estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for season, monthly income, mother's education, and study arm. n = number of children included in analysis.

Pathway	Indicator	Rash (prospective)					Bruise (prospective)				
		n	PR	95% CI	P-value		n	PR	95% CI	P-value	
Tubewell	% positive <i>E. coli</i>	2774	1.15	0.88	1.50	0.307	2774	1.10	0.77	1.56	0.600
	log MPN <i>E. coli</i>	2774	0.98	0.83	1.15	0.801	2774	0.97	0.75	1.26	0.821
Stored water	% positive <i>E. coli</i>	2709	0.97	0.76	1.24	0.812	2709	0.81	0.55	1.20	0.301
	log MPN <i>E. coli</i>	2709	1.00	0.89	1.12	0.968	2709	0.95	0.80	1.13	0.577
Hands	% positive <i>E. coli</i>	2936	1.01	0.80	1.28	0.945	2936	1.04	0.79	1.38	0.768
	log MPN <i>E. coli</i>	2936	1.08	0.95	1.23	0.254	2936	0.97	0.79	1.18	0.740
Food	% positive <i>E. coli</i>	2733	1.13	0.92	1.40	0.243	2733	1.04	0.73	1.47	0.838
	log MPN <i>E. coli</i>	2733	1.03	0.95	1.12	0.459	2733	1.00	0.87	1.16	0.981
Flies	% positive <i>E. coli</i>	3032	0.84	0.63	1.12	0.240	3032	1.19	0.80	1.76	0.390
	log MPN <i>E. coli</i>	3032	0.99	0.88	1.11	0.857	3032	1.11	0.95	1.29	0.203
Pond	log MPN <i>E. coli</i>	2925	1.00	0.91	1.09	0.951	2925	0.90	0.79	1.03	0.129
Soil	log MPN <i>E. coli</i>	2990	1.00	0.91	1.10	0.940	2990	0.95	0.82	1.10	0.520

Table S5 Bivariate associations between *E. coli* contamination along each pathway and illness for the control group only. Incident rate ratio (IRR; prospective analysis) estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for season, monthly income, mother's education, and an offset for child days at risk; n = number of children included in analysis.

Pathway	Indicator	WHO Defined Diarrhea					Caregiver Defined Diarrhea					Bloody Stool				
		n	IRR	95% CI	P-value		n	IRR	95% CI	P-value		n	IRR	95% CI	P-value	
Tubewell	% positive <i>E. coli</i>	593	0.76	0.42	1.38	0.365	628	1.05	0.60	1.84	0.865	667	0.30	0.07	1.32	0.111
	log MPN <i>E. coli</i>	593	0.77	0.48	1.24	0.284	628	0.93	0.62	1.39	0.731	667	0.22	0.04	1.25	0.088
Stored water	% positive <i>E. coli</i>	527	0.97	0.56	1.69	0.918	558	0.78	0.44	1.37	0.386	593	1.41	0.33	6.00	0.640
	log MPN <i>E. coli</i>	527	0.89	0.72	1.10	0.267	558	0.93	0.74	1.17	0.539	593	1.11	0.69	1.80	0.662
Hands	% positive <i>E. coli</i>	625	2.31	1.52	3.51	0.000	661	1.66	1.04	2.66	0.033	703	1.08	0.44	2.65	0.871
	log MPN <i>E. coli</i>	625	1.40	1.11	1.77	0.005	661	1.41	1.13	1.76	0.003	703	0.71	0.32	1.60	0.413
Food	% positive <i>E. coli</i>	578	1.21	0.76	1.91	0.422	611	1.11	0.68	1.80	0.678	651	1.55	0.42	5.74	0.515
	log MPN <i>E. coli</i>	578	1.07	0.84	1.36	0.565	611	1.14	0.91	1.43	0.263	651	1.18	0.74	1.90	0.488
Flies	% positive <i>E. coli</i>	645	1.24	0.68	2.25	0.487	681	0.97	0.50	1.90	0.940	724	1.17	0.30	4.53	0.823
	log MPN <i>E. coli</i>	645	1.04	0.82	1.30	0.766	681	1.04	0.80	1.34	0.791	724	0.83	0.46	1.50	0.546
Pond	log MPN <i>E. coli</i>	623	1.02	0.82	1.28	0.830	658	1.14	0.90	1.44	0.290	700	0.65	0.38	1.11	0.116
Soil	log MPN <i>E. coli</i>	636	0.94	0.77	1.14	0.534	671	0.98	0.79	1.20	0.815	713	0.72	0.49	1.07	0.102

Table S6 Subgroup analyses showing bivariate associations between illness and *E. coli* contamination along each pathway by season (rainy and dry). Incidence rate ratio (IRR; prospective analysis) estimates generated with generalized linear models. All models include robust standard errors at cluster level and adjust for monthly income, mother's education, and an offset for child days at risk; n = number of children included in analysis.

WHO defined diarrhea		Rainy					Dry				
Pathway	Indicator	n	IRR	95% CI		P-value	n	IRR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	775	0.64	0.36	1.14	0.132	982	1.09	0.70	1.68	0.707
	log MPN <i>E. coli</i>	775	0.67	0.40	1.14	0.141	982	0.81	0.58	1.12	0.199
Stored water	% positive <i>E. coli</i>	745	0.77	0.41	1.45	0.416	958	0.90	0.61	1.35	0.621
	log MPN <i>E. coli</i>	745	1.02	0.80	1.32	0.854	958	0.87	0.72	1.05	0.141
Hands	% positive <i>E. coli</i>	835	1.39	0.87	2.22	0.168	1040	1.57	1.16	2.13	0.003
	log MPN <i>E. coli</i>	835	1.14	0.90	1.46	0.274	1040	1.29	1.06	1.56	0.010
Food	% positive <i>E. coli</i>	750	1.29	0.75	2.22	0.355	981	1.30	0.95	1.78	0.107
	log MPN <i>E. coli</i>	750	1.13	0.92	1.38	0.238	981	1.10	0.96	1.27	0.153
Flies	% positive <i>E. coli</i>	858	0.96	0.54	1.71	0.889	1070	1.32	0.86	2.04	0.208
	log MPN <i>E. coli</i>	858	0.96	0.77	1.19	0.692	1070	1.16	0.98	1.38	0.088
Pond	log MPN <i>E. coli</i>	844	0.82	0.64	1.06	0.129	1020	1.07	0.91	1.25	0.427
Soil	log MPN <i>E. coli</i>	829	0.94	0.77	1.13	0.498	1071	1.03	0.89	1.19	0.682
Caregiver-defined diarrhea		n	IRR	95% CI		P-value	n	IRR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	794	0.93	0.55	1.57	0.776	1054	0.75	0.44	1.26	0.276
	log MPN <i>E. coli</i>	794	0.87	0.57	1.31	0.504	1054	0.77	0.51	1.17	0.224
Stored water	% positive <i>E. coli</i>	765	0.99	0.53	1.84	0.963	1030	0.83	0.50	1.36	0.457
	log MPN <i>E. coli</i>	765	1.20	0.95	1.53	0.131	1030	0.83	0.65	1.04	0.111
Hands	% positive <i>E. coli</i>	855	1.29	0.80	2.08	0.302	1116	1.71	1.16	2.51	0.006
	log MPN <i>E. coli</i>	855	1.19	0.94	1.50	0.144	1116	1.43	1.13	1.81	0.003
Food	% positive <i>E. coli</i>	765	1.08	0.65	1.82	0.761	1055	1.20	0.80	1.80	0.371
	log MPN <i>E. coli</i>	765	1.11	0.92	1.34	0.259	1055	1.09	0.90	1.33	0.386
Flies	% positive <i>E. coli</i>	878	0.69	0.38	1.26	0.226	1147	0.87	0.48	1.60	0.657
	log MPN <i>E. coli</i>	878	0.92	0.72	1.17	0.509	1147	0.93	0.70	1.23	0.595
Pond	log MPN <i>E. coli</i>	863	0.92	0.72	1.17	0.491	1096	1.04	0.85	1.26	0.716
Soil	log MPN <i>E. coli</i>	847	1.00	0.81	1.24	0.986	1148	1.15	0.96	1.38	0.130
Blood in stool		n	IRR	95% CI		P-value	n	IRR	95% CI		P-value
Tubewell	% positive <i>E. coli</i>	841	0.72	0.30	1.73	0.462	1133	0.87	0.28	2.69	0.811
	log MPN <i>E. coli</i>	841	0.68	0.35	1.30	0.241	1133	0.82	0.42	1.61	0.567
Stored water	% positive <i>E. coli</i>	815	1.48	0.50	4.32	0.478	1107	2.06	0.70	6.03	0.188
	log MPN <i>E. coli</i>	815	1.34	0.96	1.89	0.089	1107	0.96	0.56	1.63	0.882
Hands	% positive <i>E. coli</i>	910	1.43	0.66	3.09	0.364	1201	2.56	1.03	6.37	0.043
	log MPN <i>E. coli</i>	910	0.96	0.54	1.71	0.885	1201	1.93	1.26	2.95	0.003
Food	% positive <i>E. coli</i>	816	1.69	0.49	5.90	0.408	1134	3.50	1.36	8.98	0.009
	log MPN <i>E. coli</i>	816	1.23	0.87	1.74	0.240	1134	1.48	1.16	1.89	0.002
Flies	% positive <i>E. coli</i>	933	1.35	0.55	3.29	0.513	1233	1.10	0.32	3.79	0.876
	log MPN <i>E. coli</i>	933	1.04	0.73	1.49	0.815	1233	1.10	0.68	1.80	0.693
Pond	log MPN <i>E. coli</i>	914	0.74	0.47	1.17	0.195	1180	1.27	0.92	1.75	0.144
Soil	log MPN <i>E. coli</i>	901	1.05	0.62	1.78	0.852	1234	1.28	0.83	1.99	0.263