Supplementary Materials

Fig S1. Study design

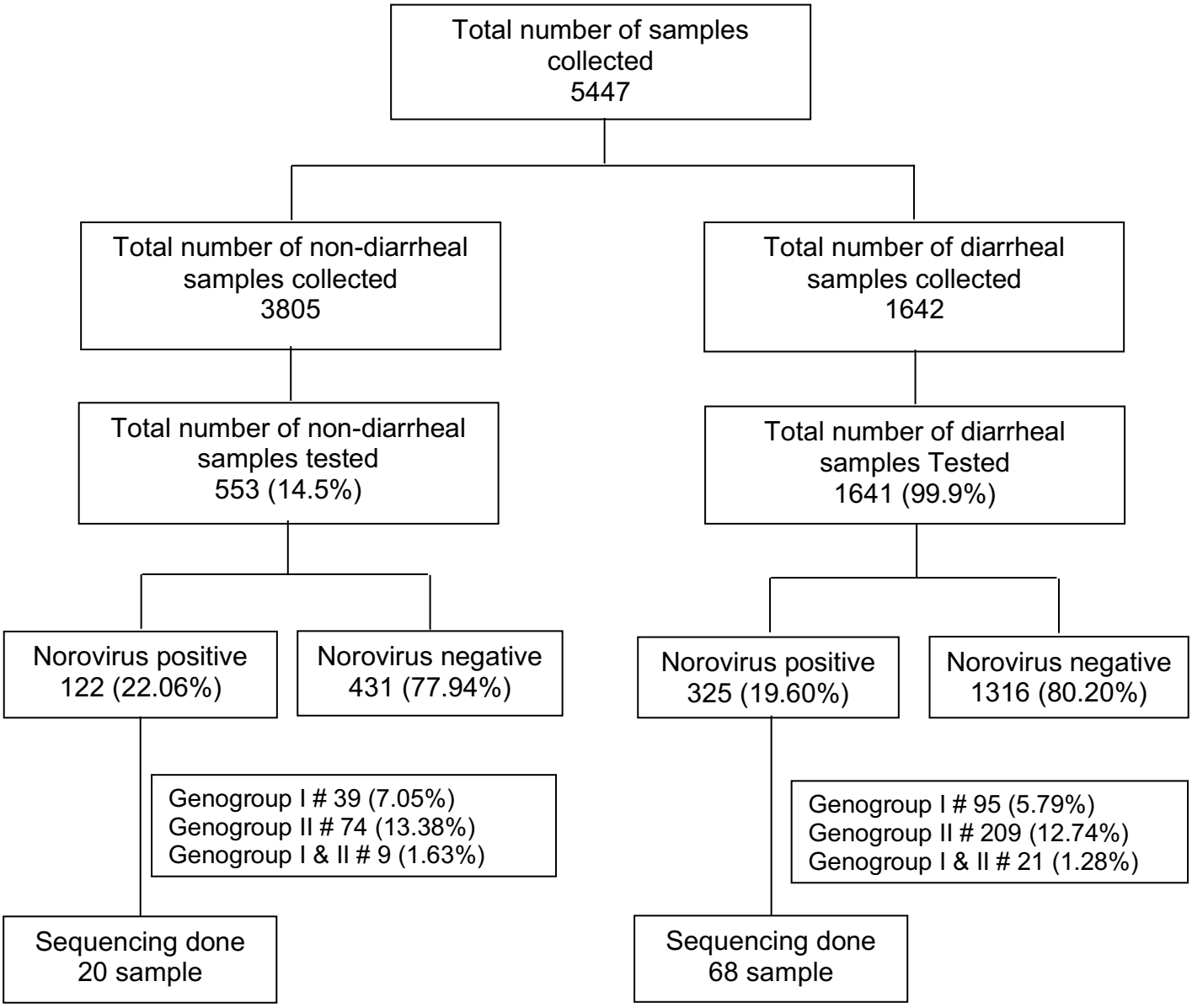

Fig. S2. Proportion of children testing positive for norovirus, by age. The proportion of children ages 0-24 months in the Bangladesh cohort with a PCR-positive norovirus test (blue = GI, red = GII), by age (month).

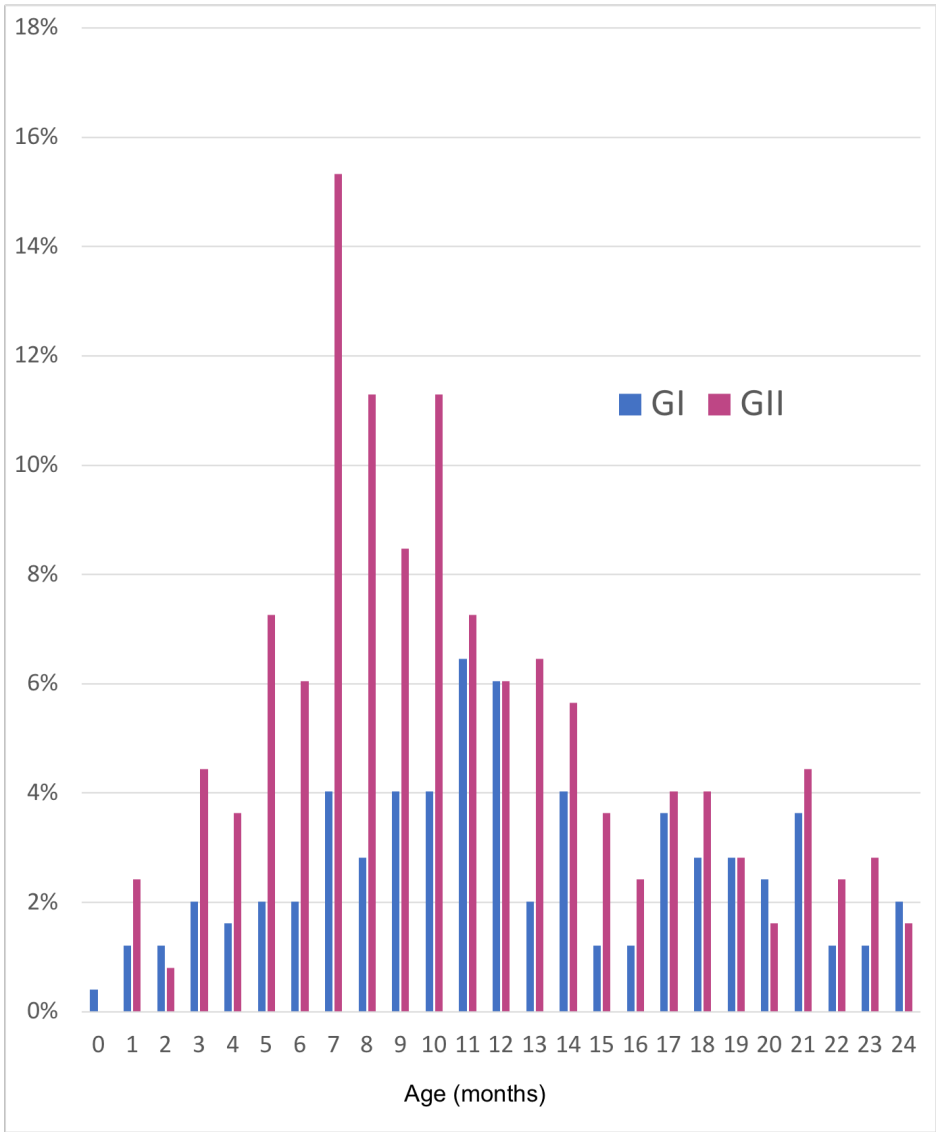

Fig. S3. GII tree (VP1 gene). Similar tree as presented in Fig. 1A, with tip labels. Shading and labels are similar to Fig. 1A. Viruses from Bangladesh have names beginning with 'BG' and are highlighted in bold font. The eighteen GII genotypes identified in the Dhaka birth cohort are labeled 'BG'.

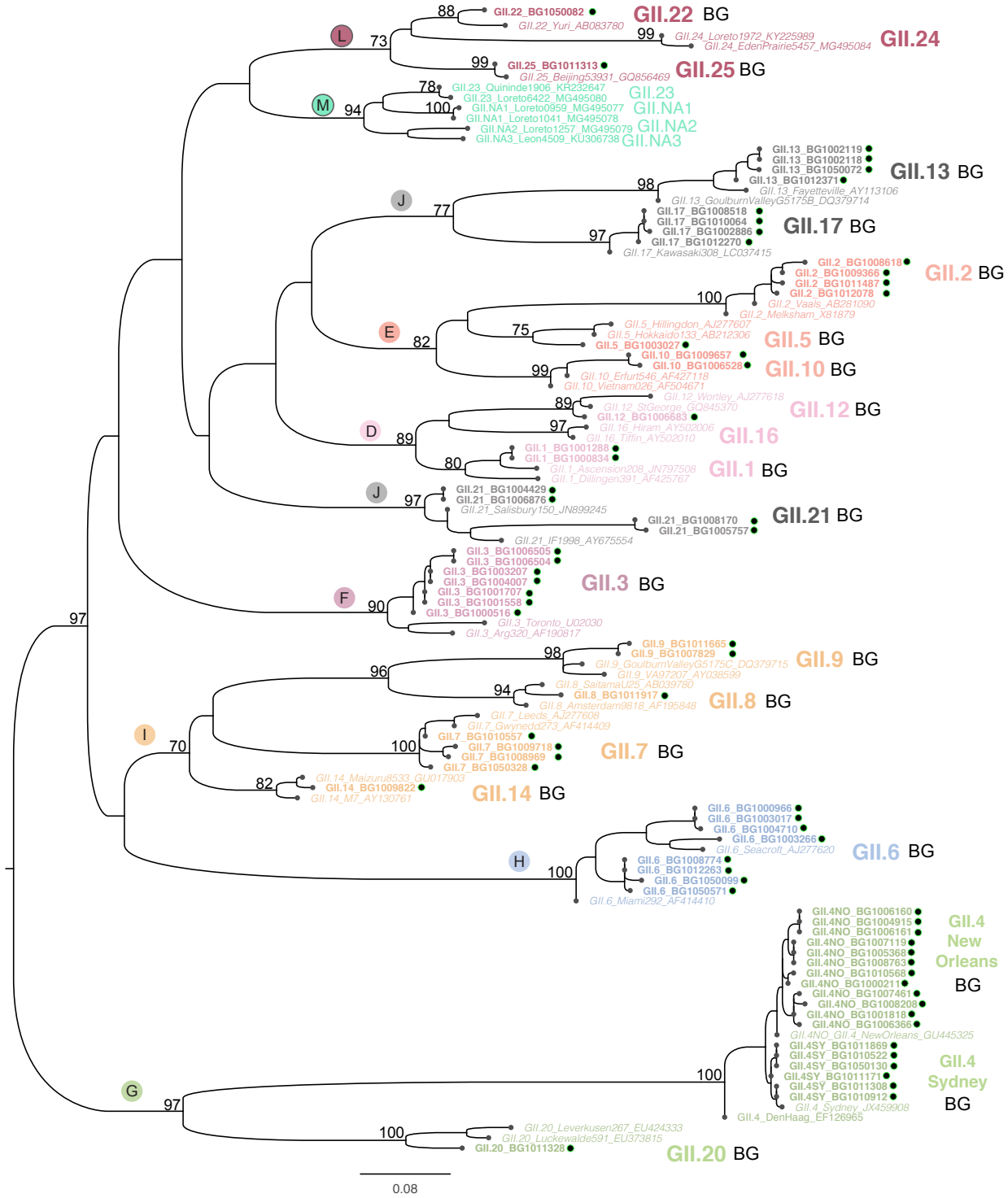

Fig. S4. Phylogenetic relationships of monthly and diarrheal stools. ML tree of VP1 GII viruses from Bangladesh only. Each tip is shaded by a red diamond (monthly non-diarrheal stool) or black square (diarrheal stool, similar to symbols used in Fig. 2) to show the lack of clustering of cases by collection type. Genotypes are shaded similar to Fig. 1B.

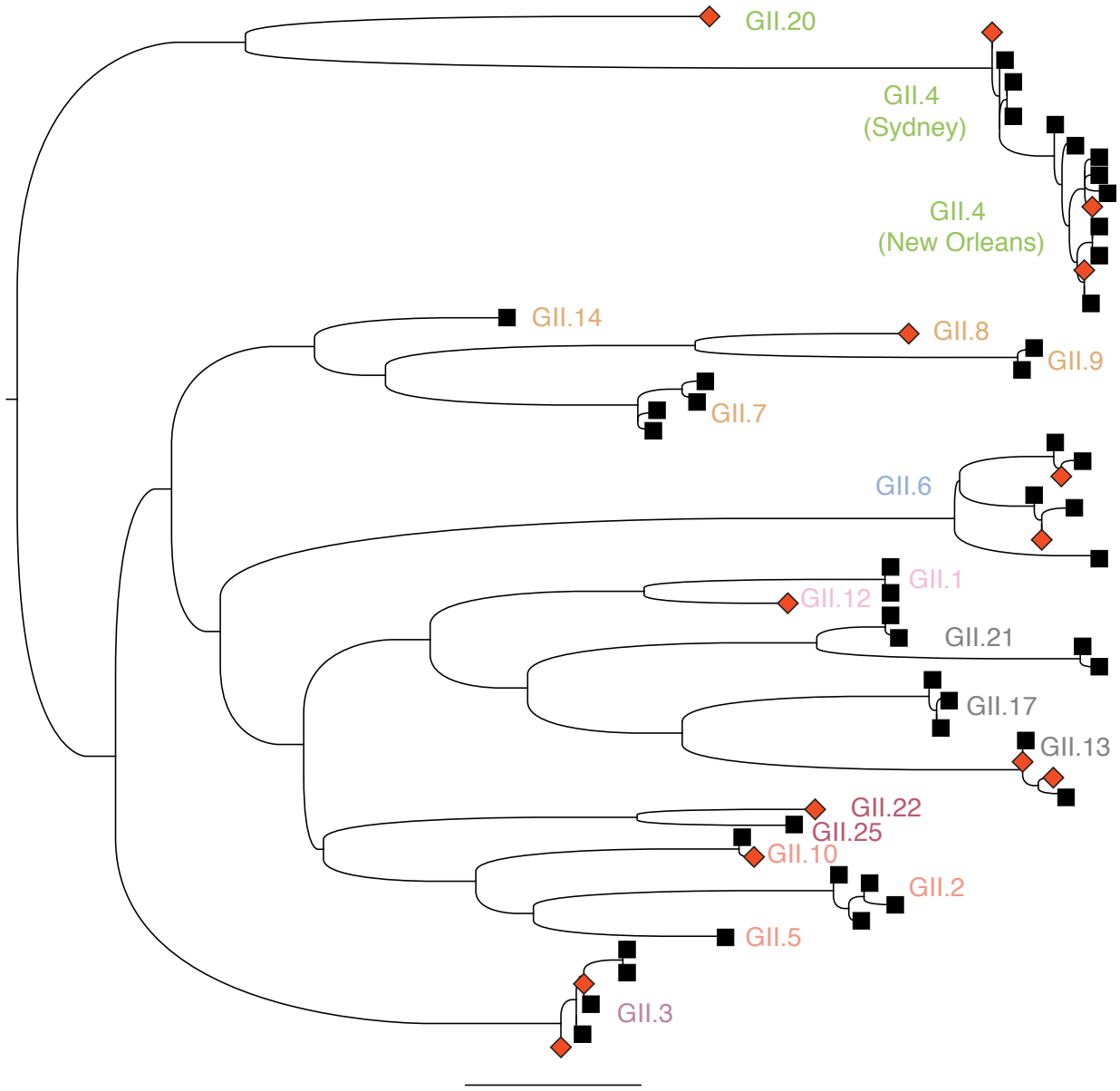

Fig. S5. GI tree (RdRp gene). Evolutionary relationships between noroviruses (RdRp gene, GI genogroup) collected from children in Dhaka, Bangladesh, with reference sequences representing genotypes observed globally included as background. Viruses from Bangladesh have names beginning with 'BG' and are highlighted in bold font and indicated with a green circle.

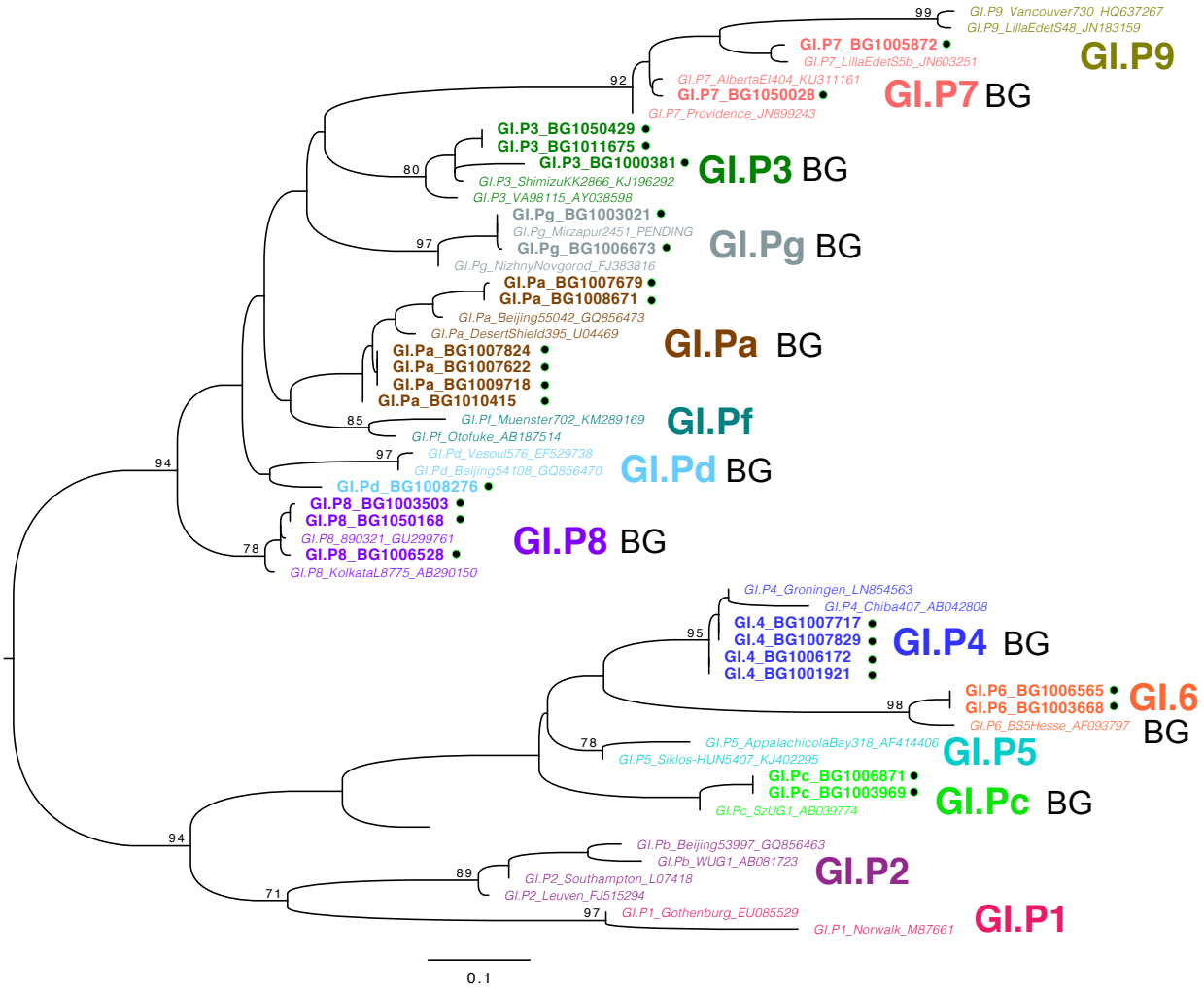

Fig. S6. GII tree (RdRp gene). Evolutionary relationships between noroviruses (RdRp gene, GII genogroup) collected from children in Dhaka, Bangladesh, with reference sequences representing genotypes observed globally included as background. Viruses from Bangladesh have names beginning with 'BG' and are highlighted in bold font and indicated with a green circle.

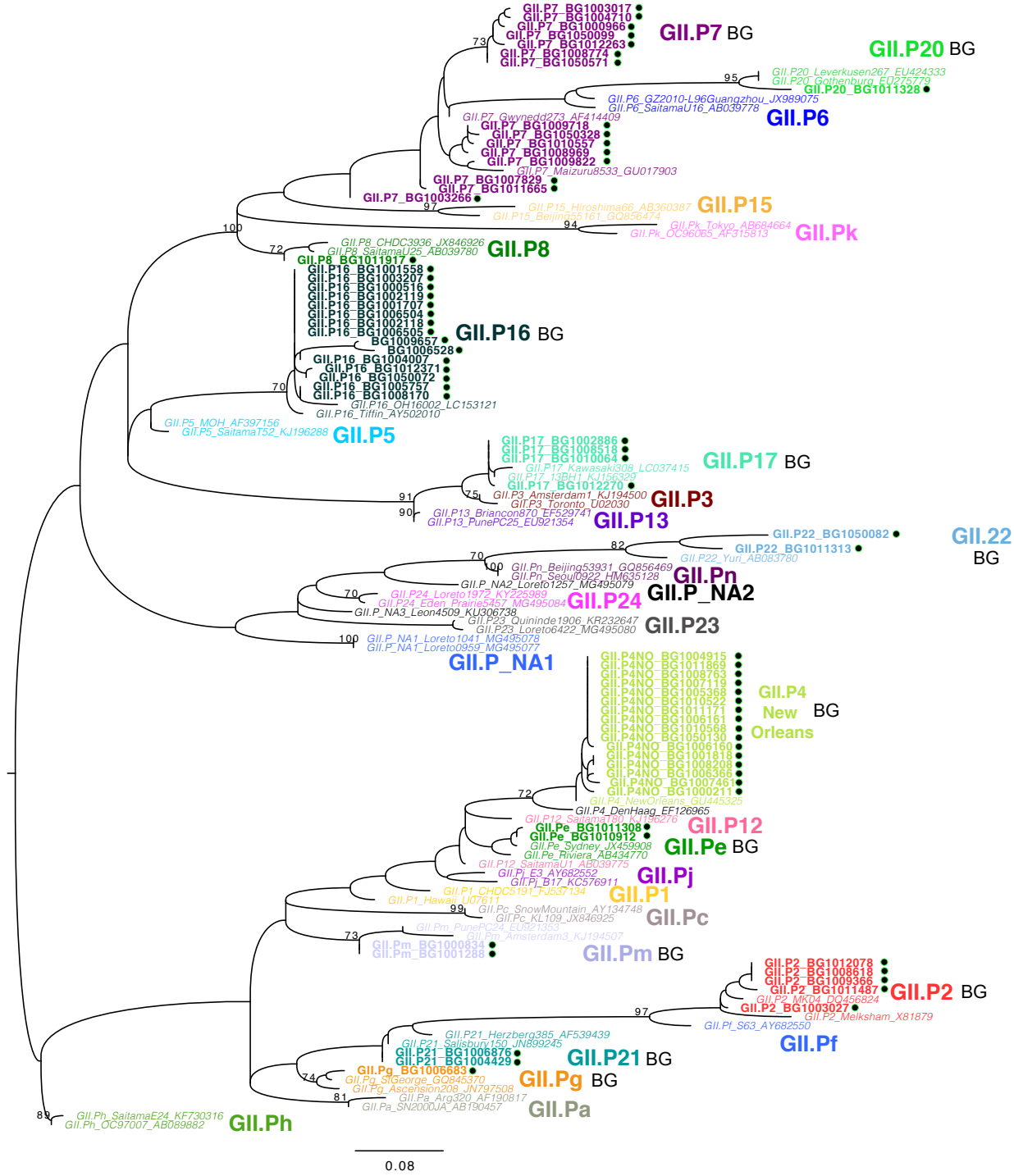

Fig. S7. Samples testing positive for norovirus within re-infected children. Each circle represents a diarrheal sample collected from a child in the cohort that was tested for norovirus. Each triangle represents a non-diarrheal sample that was obtained during routine monthly collections. Circles and triangles are shaded by the PCR test result: grey = negative for norovirus; blue = positive for GI; red = positive for GII; purple = positive for GI and GII. Each row represents the samples obtained from an individual child in the cohort. The y-axis is ordered by children with the lowest number of norovirus-positive samples identified during the first two years of life (0 positive samples, bottom) to the highest (10, top). The x-axis indicates the child's age at which the sample was collected (0-24 months). The total number of positive noroviruses detected in all children of a given age (month) is indicated by the black-and-white heat-map provided on the x-axis.

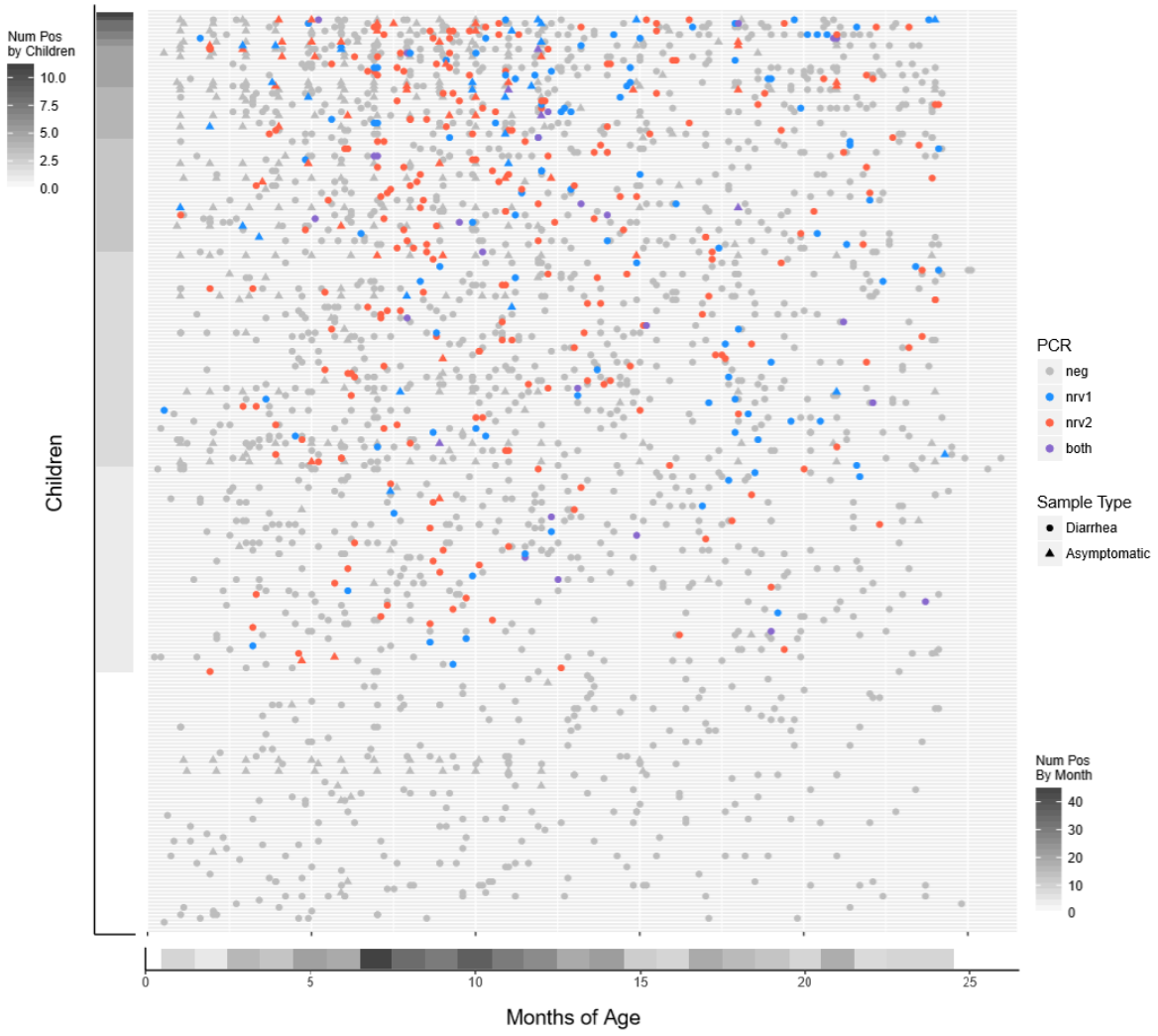

Table S1: Burden of norovirus infection in MAL-ED children of Bangladesh

	Diarrheal	Non-diarrheal
Total number of children	265	49
Total number of infected children	162	27
Total number of re-infected children	86	19
Child-months contributed	5584	324
Total episodes[#] with a norovirus sample associated	307	72
Total episodes with a GI sample associated	110	30
Total episodes with a GII sample associated	214	47
Total episodes wth a GI and GII sample associated	17	5
Incidence rate of norovirus (per 100 child-months)	5.49	22.22
Incidence rate of norovirus genogroup I (per 100 child-months)	1.97	9.26
Incidence rate of norovirus genogroup II (per 100 child-months)	3.83	14.51

[#] All detections, whether asymptomatic or diarrheal, were considered episodes for the calculation of incidence rates.

Table S2. Study population characteristics

Indicator	Selected children for sequencing N=70	All norovirus positive children N=179	All children N=248
Male sex, n (%)	30 (42.86)	84 (46.93)	122 (49.19)
Low birth weight, n (%)	13 (18.57)	43 (24.02)	54 (21.77)
Weight for age z score at birth, mean ± SD	-1.23 ± 0.87	-1.34 ± 0.92	-1.30 ± 0.91
Length for age z score at birth, mean ± SD	-1.00 ± 1.00	-1.08 ± 0.99	-1.06 ± 1.01
Weight for length z score at birth, mean ± SD	-0.92 ± 0.87	-1.04 ± 1.06	-0.99 ± 1.07
Duration of EBF in days, median (IQR)	95.5 (38, 150)	96 (53, 150)	98.5 (57, 150)
Mother's age in years, median (IQR)	23 (20, 27)	25 (20, 27)	25 (21, 28)
Mother's education in years, median (IQR)	5 (2, 7)	5 (2, 7)	5 (2, 7)
Mother's BMI, mean ± SD	22.43 ± 3.31	22.13 ± 3.25	22.33 ± 3.43
WAMI score, mean ± SD	0.56 ± 0.10	0.55 ± 0.12	0.55 ± 0.12
Household food insecurity access category:			
Food secure	50 (71.43)	133 (74.30)	187 (75.40)
Mildly food insecure	7 (10.00)	12 (6.70)	14 (5.65)
Moderately food insecure	6 (8.57)	19 (10.61)	29 (11.69)
Severely food insecure	7 (10.00)	15 (8.38)	18 (7.26)
Wash hands after helping child defecate:			
Never	5 (7.14)	11 (6.21)	16 (6.69)
Rarely	6 (8.57)	15 (8.47)	16 (6.69)
Sometime	8 (11.43)	24 (13.56)	33 (13.81)
Always	51 (72.86)	127 (71.75)	174 (72.80)
Wash hands before preparing food:			
Never	33 (47.14)	89 (50.28)	118 (49.37)
Rarely	3 (7.14)	19 (10.73)	26 (10.88)
Sometime	14 (20.00)	30 (16.95)	42 (17.57)
Always	18 (24.71)	39 (22.03)	53 (22.18)
Wash hands after using the toilet:			
Never	3 (4.29)	8 (4.52)	9 (3.77)
Rarely	6 (8.57)	17 (9.60)	18 (7.53)
Sometime	9 (12.86)	27 (15.25)	31 (12.97)
Always	52 (74.29)	125 (70.62)	181 (75.73)

Table S3. Summary of norovirus genotypes identified in the Dhaka birth cohort

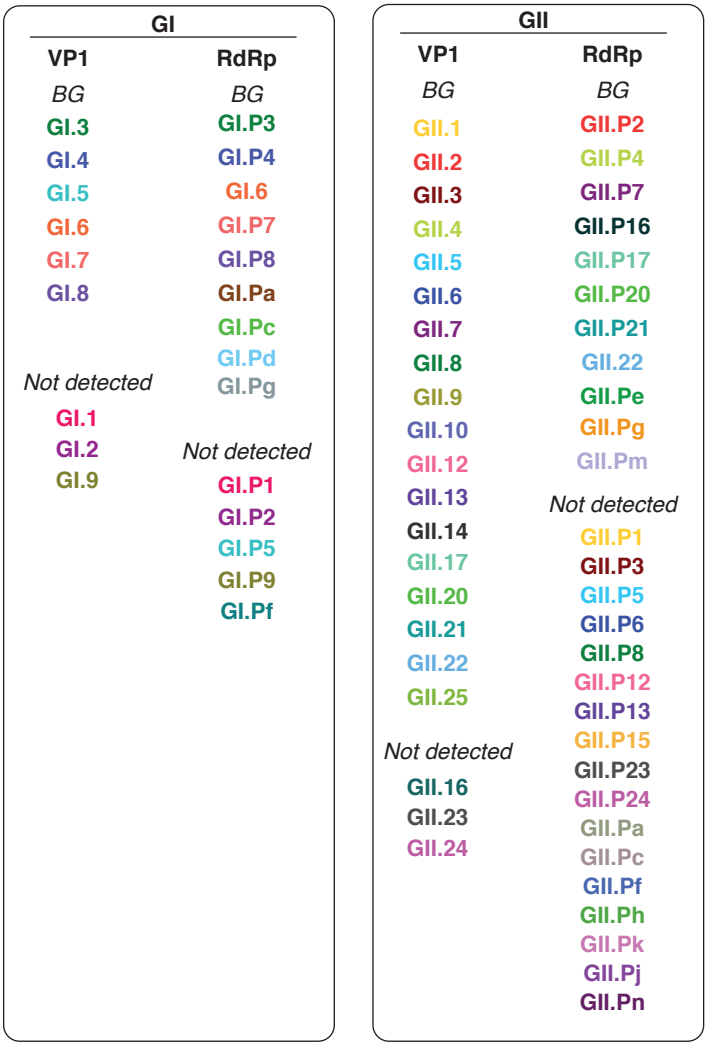

Table S4. Summary of recombinant noroviruses

	Polymerase	Capsid	Virus identifier(s)
GI	GI.Pa	GI.3	BG1007679 BG1008671
	GI.Pa	GI.3	BG1010415 BG1007622 BG1007824 BG1009718 BG1000381
	GI.Pc	GI.5	BG1003969 BG1006871
	GI.Pg	GI.7	BG1003021 BG1006673
	GI.Pd	GI.3	BG1008276
GII	GII.P2	GII.5	BG1003027
	GII.P7	GII.6	BG1003266 BG1050099 BG1012263 BG1008774 BG1050571 BG1000966 BG1003017 BG1004710
	GII.P7	GII.9	BG1007829 BG1011665
	GII.P7	GII.14	BG1009822
	GII.P16	GII.10	BG1006528 BG1009657
	GII.P16	GII.3	BG1006504 BG1006505 BG1000516 BG1001558 BG1004007 BG1001707 BG1003207
	GII.P16	GII.21	BG1005757 BG1008170
	GII.P16	GII.13	BG1012371 BG1002118 BG1002119 BG1050072
	GII.22	GII.25	BG1011313
	GII.Pe	GII.4	BG1010912 BG1011308
	GII.Pg	GII.12	BG1006683
	GII.Pm	GII.1	BG1000834 BG1001288

Table S5. Characteristics of norovirus samples sequenced for this study. Each sample is described as either M (routine monthly non-diarrheal stool collection) or D (diarrheal stool collection). The age (days) and sex is provided, along with the collection date and the genotyping results.

Monthly/ Diarrheal	Collection date	Age (d)	Sex	RdRp	VP1
M	13-Nov-10	59	F	GI.P8	GI.8
M	13-Dec-10	273	F	GII.P16	GII.3
M	18-Dec-10	121	M	GII.P16	GII.3
M	7-Mar-11	57	M	GII.P16	GII.3
M	28-Mar-11	271	M	GII.P16	GII.13
M	7-Apr-11	241	F	GII.P7	GII.6
M	7-Jun-11	302	F	GI.Pg	GI.7
M	26-Aug-11	179	M	GII.P4NO	GII.4NO
M	31-Oct-11	335	F	GII.P4NO	GII.4NO
M	2-Nov-11	450	F	GII.P2	GII.5
M	7-Jan-12	363	M	GI.P8/GII.P16	GI.8/GII.10
M	26-Jan-12	124	F	GII.Pe	GII.4SY
M	2-Jun-12	150	F	GI.P8	GI.8
M	17-Jul-12	212	F	GII.P7	GII.6
M	22-Jul-12	547	M	GII.Pg	GII.12
M	1-Aug-12	213	M	GII.P16	GII.13
M	22-Sep-12	364	F	GII.P20	GII.20
M	31-Oct-12	304	M	GII.P22	GII.22
M	25-Nov-12	373	F	GII.P8	GII.8
M	19-Dec-12	334	F	GI.P3	GI.3
D	21-Aug-10	181	F	GII.P4NO	GII.4NO
D	29-Sep-10	142	M	GII.P16	GII.3
D	6-Oct-10	140	F	GII.P16	GII.3
D	27-Oct-10	212	F	GII.P7	GII.6
D	1-Jan-11	100	F	GII.P16	GII.3
D	28-Feb-11	243	M	GII.P16	GII.13
D	9-Mar-11	59	M	GII.P16	GII.3
D	15-Mar-11	295	M	GII.P4NO	GII.4NO
D	24-Mar-11	101	F	GII.P16	GII.21
D	7-May-11	188	F	GII.P7	GII.6
D	9-May-11	258	F	GII.P7	GII.6
D	14-May-11	338	M	GI.P4	GI.4
D	9-Jul-11	294	F	GI.P6	GI.6
D	13-Jul-11	204	F	GII.P4NO	GII.4NO

D	19-Jul-11	210	F	GII.P4NO	GII.4NO
D	19-Jul-11	187	M	GI.P6	GI.6
D	27-Jul-11	270	M	GII.P4NO	GII.4NO
D	6-Aug-11	304	F	GI.Pc	GI.5
D	7-Aug-11	220	F	GII.P4NO	GII.4NO
D	11-Aug-11	529	F	GI.P3	GI.3
D	19-Sep-11	171	F	GII.P4NO	GII.4NO
D	22-Sep-11	99	F	GII.P16	GII.10
D	3-Nov-11	274	F	GII.P4NO	GII.4NO
D	16-Nov-11	289	F	GI.Pc	GI.5
D	19-Nov-11	341	M	GI.P7	GI.7
D	27-Nov-11	217	F	GII.P4NO	GII.4NO
D	7-Dec-11	106	M	GII.P7	GII.7
D	12-Dec-11	277	M	GI.P4	GI.4
D	26-Dec-11	267	M	GII.P16	GII.21
D	29-Dec-11	373	F	GI.P4	GI.4
D	19-Jan-12	234	F	GII.P2	GII.2
D	21-Jan-12	280	M	GII.P2	GII.2
D	5-Feb-12	267	M	GII.P7	GII.7
D	7-Feb-12	664	M	GII.Pm	GII.1
D	7-Feb-12	331	F	GI.Pa	GI.3
D	11-Feb-12	376	F	GII.P21	GII.21
D	13-Feb-12	239	F	GI.Pa/GII.P7	GI.3/GII.7
D	19-Feb-12	341	F	GI.Pa	GI.3
D	28-Feb-12	402	M	GI.Pg	GI.7
D	3-Mar-12	330	F	GII.P17	GII.17
D	4-Mar-12	231	F	GII.P17	GII.17
D	13-Mar-12	719	M	GII.Pm	GII.1
D	19-Mar-12	591	M	GII.P17	GII17
D	3-Apr-12	192	F	GII.P25	GII.25
D	9-Apr-12	371	M	GI.Pd	GI.3
D	12-Apr-12	549	M	GII.P21	GII.21
D	19-Apr-12	226	F	GII.Pe	GII.4SY
D	22-Apr-12	252	M	GI.Pa	GI.3
D	25-Apr-12	374	M	GI.Pa	GI.3
D	29-Apr-12	250	M	GII.P4NO	GII.4NO
D	6-May-12	418	M	GI.Pa	GI.3
D	13-May-12	425	F	GI.P4/GII.P7	GI.4/GII.9
D	1-Jul-12	252	F	GII.P7	GII.9
D	4-Jul-12	437	F	GII.P7	GII.6

D	18-Aug-12	415	F	GII.P7	GII.14
D	4-Sep-12	302	F	GII.P4NO	GII.4SY
D	4-Sep-12	213	M	GII.P7	GII.6
D	2-Oct-12	275	M	GII.4NO	GII.4SY
D	15-Oct-12	421	M	GII.P4NO	GII.4SY
D	21-Oct-12	397	F	GII.P4NO	GII.4SY
D	7-Nov-12	325	F	GII.P17	GII.17
D	26-Dec-12	370	M	GII.P16	GII.13
D	21-Jan-13	456	F	GI.P3	GI.3
D	26-Jan-13	417	F	GII.P2	GII.2
D	12-Feb-13	403	F	GII.P7	GII.7
D	24-Mar-13	453	F	GI.P7	GI.7
D	7-Apr-13	543	M	GII.P2	GII.2
D	16-Apr-13	471	M	GII.P7	GII.6