



Figure S1. Timetree for HAdV evolutionary analysis by Maximum Likelihood method. The log likelihood value of the topology is -742.94. The tree is drawn to scale, with branch lengths measured in the relative number of substitutions per site with node height error bar. The red italicized sequences are our HAdV sequences recovered from raw water samples.

Table S1. Maximum Likelihood fits of 24 different nucleotide substitution models

Model	#Param	BIC*	AICc	InL	Invariant	Gamma	R	Freq A	Freq T	Freq C	Freq G	A=>T	A=>C	A=>G	T=>A	T=>C	T=>G	C=>A	C=>T	C=>G	G=>A	G=>T	G=>C
T92	85	2286.21	1664.90	- 746.79	n/a	n/a	0.9483	0.2025	0.2025	0.2975	0.2975	0.05	0.07	0.15	0.05	0.15	0.07	0.05	0.1	0.07	0.1	0.05	0.07
T92+G	86	2288.15	1659.54	- 743.10	n/a	0.6221	0.9592	0.2025	0.2025	0.2975	0.2975	0.05	0.07	0.15	0.05	0.15	0.07	0.05	0.1	0.07	0.1	0.05	0.07
T92+I	86	2288.35	1659.74	- 743.20	0.5027	n/a	0.9516	0.2025	0.2025	0.2975	0.2975	0.05	0.07	0.15	0.05	0.15	0.07	0.05	0.1	0.07	0.1	0.05	0.07
JC	83	2290.72	1684.00	- 758.37	n/a	n/a	0.5000	0.25	0.25	0.25	0.25	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
JC+G	84	2291.94	1677.92	- 754.32	n/a	0.5723	0.5000	0.25	0.25	0.25	0.25	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
JC+I	84	2293.08	1679.06	- 754.89	0.3908	n/a	0.5000	0.25	0.25	0.25	0.25	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
K2	84	2293.80	1679.79	- 755.25	n/a	n/a	0.9412	0.25	0.25	0.25	0.25	0.06	0.06	0.12	0.06	0.12	0.06	0.06	0.12	0.06	0.12	0.06	0.06
K2+G	85	2295.21	1673.90	- 751.29	n/a	0.5873	0.9585	0.25	0.25	0.25	0.25	0.06	0.06	0.12	0.06	0.12	0.06	0.06	0.12	0.06	0.12	0.06	0.06
K2+I	85	2296.38	1675.07	- 751.88	0.3908	n/a	0.9471	0.25	0.25	0.25	0.25	0.06	0.06	0.12	0.06	0.12	0.06	0.06	0.12	0.06	0.12	0.06	0.06
T92+G+I	87	2297.64	1661.74	- 743.18	0.0112	0.6404	0.9592	0.2025	0.2025	0.2975	0.2975	0.05	0.07	0.15	0.05	0.15	0.07	0.05	0.1	0.07	0.1	0.05	0.07
JC+G+I	85	2301.34	1680.03	- 754.36	0.1292	0.7870	0.5000	0.25	0.25	0.25	0.25	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
HKY	87	2301.69	1665.79	- 745.21	n/a	n/a	0.9487	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.13	0.05	0.17	0.07	0.05	0.09	0.07	0.11	0.05	0.08
HKY+G	88	2303.90	1660.71	- 741.65	n/a	0.6415	0.9529	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.13	0.05	0.17	0.07	0.05	0.09	0.07	0.11	0.05	0.08
HKY+I	88	2303.96	1660.77	- 741.68	0.4971	n/a	0.9460	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.13	0.05	0.17	0.07	0.05	0.09	0.07	0.11	0.05	0.08
K2+G+I	86	2304.57	1675.97	- 751.31	0.0106	0.6033	0.9584	0.25	0.25	0.25	0.25	0.06	0.06	0.12	0.06	0.12	0.06	0.06	0.12	0.06	0.12	0.06	0.06
TN93	88	2309.58	1666.39	- 744.49	n/a	n/a	0.9435	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.1	0.05	0.2	0.07	0.05	0.11	0.07	0.08	0.05	0.08
TN93+G	89	2312.14	1661.66	- 741.11	n/a	0.6673	0.9485	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.1	0.05	0.2	0.07	0.05	0.11	0.07	0.08	0.05	0.08
TN93+I	89	2312.24	1661.76	- 741.16	0.4879	n/a	0.9410	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.1	0.05	0.2	0.07	0.05	0.11	0.07	0.08	0.05	0.08
HKY+G+I	89	2313.33	1662.85	- 741.70	0.0649	0.7511	0.9528	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.13	0.05	0.17	0.07	0.05	0.09	0.07	0.11	0.05	0.08
TN93+G+I	90	2321.64	1663.86	- 741.19	0	0.6677	0.9484	0.2153	0.1897	0.3339	0.2611	0.05	0.08	0.1	0.05	0.2	0.07	0.05	0.11	0.07	0.08	0.05	0.08
GTR	91	2333.87	1668.80	- 742.65	n/a	n/a	0.9470	0.2153	0.1897	0.3339	0.2611	0.03	0.07	0.1	0.04	0.2	0.11	0.05	0.11	0.05	0.08	0.08	0.07
GTR+G	92	2336.84	1664.48	- 739.47	n/a	0.7032	0.9563	0.2153	0.1897	0.3339	0.2611	0.03	0.08	0.1	0.04	0.2	0.11	0.05	0.11	0.05	0.08	0.08	0.07
GTR+I	92	2336.96	1664.60	- 739.53	0.4771	n/a	0.9489	0.2153	0.1897	0.3339	0.2611	0.03	0.07	0.1	0.04	0.2	0.11	0.05	0.11	0.05	0.08	0.08	0.07
GTR+G+I	93	2346.15	1666.50	- 739.46	0.4211	6.1806	0.9521	0.2153	0.1897	0.3339	0.2611	0.03	0.07	0.1	0.04	0.2	0.11	0.05	0.11	0.05	0.08	0.08	0.07

*Models with the lowest BIC scores (Bayesian Information Criterion) are considered to describe the substitution pattern the best (written in red and bold). For each model, AICc value (Akaike Information Criterion, corrected), Maximum Likelihood value (lnL), and the number of parameters (including branch lengths) are also depicted above. 5 rate categories-discrete Gamma distribution (+*G*) was applied for modeling the evolutionary rates non-uniformity among sites and supposing that a certain fraction of sites is evolutionarily invariable (+*I*). Proposed or estimated values of transition/transversion bias (R) for each model are displayed. They are followed by nucleotide frequencies (f) and rates of base substitutions (r) for each nucleotide pair. A total of 261 positions existed in the final dataset. Abbreviations: TR: General Time Reversible; HKY: Hasegawa-Kishino-Yano; TN93: Tamura-Nei; T92: Tamura 3-parameter; K2: Kimura 2-parameter; JC: Jukes-Cantor.

Table S2. Estimates of evolutionary divergence between HAdV sequences recovered from WWTPs' raw water in Riyadh, Saudi Arabia.

Species 1	Species 2	Dist
HAdV/WW/K20-2B64/2022	HAdV/WW/K22-2B64/2022	0.0000000000
HAdV/WW/K20-2B64/2022	HAdV/WW/K24-2B64/2022	0.0000000000
HAdV/WW/K20-2B64/2022	HAdV/WW/K25-2B64/2022	0.0000000000
HAdV/WW/K20-2B64/2022	HAdV/WW/7EA-2B64/2022	0.0000000000
HAdV/WW/K19-2B64/2022	HAdV/WW/K20-2B64/2022	0.0038947342
HAdV/WW/K19-2B64/2022	HAdV/WW/K22-2B64/2022	0.0038947342
HAdV/WW/K19-2B64/2022	HAdV/WW/K24-2B64/2022	0.0038947342
HAdV/WW/K19-2B64/2022	HAdV/WW/K25-2B64/2022	0.0038947342
HAdV/WW/K19-2B64/2022	HAdV/WW/7EA-2B64/2022	0.0038947342
HAdV/WW/K20-2B64/2022	HAdV/WW/10UA-2B64/2022	0.0077749714
HAdV/WW/K20-2B64/2022	HAdV/WW/K26-2B64/2022	0.0077801023
HAdV/WW/K26-2B64/2022	HAdV/WW/7EA-2B64/2022	0.0077801023
HAdV/WW/K19-2B64/2022	HAdV/WW/10UA-2B64/2022	0.0117020094
HAdV/WW/K19-2B64/2022	HAdV/WW/K26-2B64/2022	0.0118377479
HAdV/WW/K26-2B64/2022	HAdV/WW/10UA-2B64/2022	0.0156630356
HAdV/WW/K23-2B64/2022	HAdV/WW/10UA-2B64/2022	0.0197033923
HAdV/WW/K20-2B64/2022	HAdV/WW/K23-2B64/2022	0.0197356644
HAdV/WW/K23-2B64/2022	HAdV/WW/K24-2B64/2022	0.0197356644
HAdV/WW/K23-2B64/2022	HAdV/WW/K25-2B64/2022	0.0197356644
HAdV/WW/K23-2B64/2022	HAdV/WW/7EA-2B64/2022	0.0197356644
HAdV/WW/K19-2B64/2022	HAdV/WW/K23-2B64/2022	0.0237926548
HAdV/WW/K23-2B64/2022	HAdV/WW/K26-2B64/2022	0.0238755964

The number of base substitutions per site from between sequences are shown. Analyses were conducted using the Tamura-3 parameter. The rate variation among sites was modeled with a gamma distribution (shape parameter = 1). This analysis involved 9 nucleotide sequences. Codon positions included were 1st+2nd+3rd+Noncoding. All ambiguous positions were removed for each sequence pair (pairwise deletion option). There were a total of 261 positions in the final dataset. Red bold sequences refer to same sequence identity with null evolutionary distance ($d = 0.0000$).

Table S3. Evolutionary divergence estimates between human Adenovirus sequences.

Species 1	Species 2	Dist
HAdV/St/AD5764/BRA/2001/41	HAdV/WW/K19-2B64/SAU/2022	0.00000000
HAdV/St/AD6026/BRA/2002/41	HAdV/WW/K19-2B64/SAU/2022	0.00000000
HAdV/St/AD4578/BRA/1999/41	HAdV/WW/K19-2B64/SAU/2022	0.00000000
HAdV/St/AD01-71218/BRA/2010/41	HAdV/WW/K19-2B64/SAU/2022	0.00000000
HAdV/St/AD102/BRA/2007/41	HAdV/WW/K19-2B64/SAU/2022	0.00000000
HAdV/St/AD329/BRA/2017/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD11/BRA/2015/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD8325/BRA/2004/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/Wt/IW/SAU/2018/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD178/BRA/2016/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD55/BRA/2015/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD1347/BRA/2012/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD8244/BRA/2004/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD8561/BRA/2005/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/St/AD6301/BRA/2003/41	HAdV/WW/K20-2B64/SAU/2022	0.00000000
HAdV/WW/LF2/SAU/2018/41	HAdV/WW/K20-2B64/SAU/2022	0.00384260
HAdV/Wt/WH1/SAU/2018/41	HAdV/WW/K20-2B64/SAU/2022	0.00384260
HAdV/St/AD329/BRA/2017/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD11/BRA/2015/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD8325/BRA/2004/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/Wt/IW/SAU/2018/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD178/BRA/2016/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD55/BRA/2015/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD1347/BRA/2012/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD8244/BRA/2004/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD8561/BRA/2005/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD6301/BRA/2003/41	HAdV/WW/K19-2B64/SAU/2022	0.00384669
HAdV/St/AD5764/BRA/2001/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/St/AD6026/BRA/2002/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/St/AD4578/BRA/1999/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/St/AD01-71218/BRA/2010/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/St/AD102/BRA/2007/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/St/AD454/BRA/2014/41	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/WW/K19-2B64/SAU/2022	HAdV/WW/K20-2B64/SAU/2022	0.00384669
HAdV/WW/LF2/SAU/2018/41	HAdV/WW/K19-2B64/SAU/2022	0.00770415
HAdV/Wt/WH1/SAU/2018/41	HAdV/WW/K19-2B64/SAU/2022	0.00770415
HAdV/St/AD329/BRA/2017/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD11/BRA/2015/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD8325/BRA/2004/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/Wt/IW/SAU/2018/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD178/BRA/2016/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD55/BRA/2015/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD1347/BRA/2012/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD8244/BRA/2004/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD8561/BRA/2005/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD6301/BRA/2003/41	HAdV/WW/K26-2B64/SAU/2022	0.00770415

HAdV/WW/K20-2B64/SAU/2022	HAdV/WW/K26-2B64/SAU/2022	0.00770415
HAdV/St/AD329/BRA/2017/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD11/BRA/2015/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD8325/BRA/2004/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/Wt/IW/SAU/2018/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD178/BRA/2016/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD55/BRA/2015/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD1347/BRA/2012/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD8244/BRA/2004/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD8561/BRA/2005/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/St/AD6301/BRA/2003/41	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/WW/K20-2B64/SAU/2022	HAdV/WW/10UA-2B64/SAU/2022	0.00770417
HAdV/WW/LF3/SAU/2018/41	HAdV/WW/K20-2B64/SAU/2022	0.00770780
HAdV/St/AD454/BRA/2014/41	HAdV/WW/K19-2B64/SAU/2022	0.00772417
HAdV/St/MU35/IRA/2016/41	HAdV/WW/K19-2B64/SAU/2022	0.01158423
HAdV/WW/BEL WW/UK/2022/41	HAdV/WW/K19-2B64/SAU/2022	0.01158423
HAdV/WW/LF2/SAU/2018/41	HAdV/WW/K26-2B64/SAU/2022	0.01158427
HAdV/Wt/WH1/SAU/2018/41	HAdV/WW/K26-2B64/SAU/2022	0.01158427
HAdV/WW/LF3/SAU/2018/41	HAdV/WW/K19-2B64/SAU/2022	0.01158432
HAdV/St/HOUA-GOSH02/UK/2019/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/St/GyK253/SWD/2014/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/St/RVAB/BLG/2011/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/St/F1907/CHN/2019/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/WW/HS12/USA/2009/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/St/503214/IND/2009/41	HAdV/WW/K20-2B64/SAU/2022	0.01158432
HAdV/WW/LF2/SAU/2018/41	HAdV/WW/10UA-2B64/SAU/2022	0.01158432
HAdV/Wt/WH1/SAU/2018/41	HAdV/WW/10UA-2B64/SAU/2022	0.01158432
HAdV/St/AD5764/BRA/2001/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD6026/BRA/2002/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD4578/BRA/1999/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD01-71218/BRA/2010/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD102/BRA/2007/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD454/BRA/2014/41	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/WW/K19-2B64/SAU/2022	HAdV/WW/K26-2B64/SAU/2022	0.01159671
HAdV/St/AD5764/BRA/2001/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/St/AD6026/BRA/2002/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/St/AD4578/BRA/1999/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/St/AD01-71218/BRA/2010/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/St/AD102/BRA/2007/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/St/AD454/BRA/2014/41	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/WW/K19-2B64/SAU/2022	HAdV/WW/10UA-2B64/SAU/2022	0.01159681
HAdV/WW/LMV WW/UK/2022/41	HAdV/WW/K19-2B64/SAU/2022	0.01195329
HAdV/St/SA6749/SAF/2014/41	HAdV/WW/K19-2B64/SAU/2022	0.01548723
HAdV/WW/LF3/SAU/2018/41	HAdV/WW/K26-2B64/SAU/2022	0.01548744
HAdV/WW/LF3/SAU/2018/41	HAdV/WW/10UA-2B64/SAU/2022	0.01548752
HAdV/St/HOUA-GOSH02/UK/2019/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215
HAdV/St/GyK253/SWD/2014/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215
HAdV/St/RVAB/BLG/2011/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215

HAdV/St/F1907/CHN/2019/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215
HAdV/WW/HS12/USA/2009/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215
HAdV/St/503214/IND/2009/41	HAdV/WW/K19-2B64/SAU/2022	0.01549215
HAdV/St/MU35/IRA/2016/41	HAdV/WW/K20-2B64/SAU/2022	0.01549215
HAdV/WW/BEL WW/UK/2022/41	HAdV/WW/K20-2B64/SAU/2022	0.01549215
HAdV/St/503030/IND/2009/41	HAdV/WW/K20-2B64/SAU/2022	0.01549215
HAdV/St/Tak/JAP/2008/41	HAdV/WW/K20-2B64/SAU/2022	0.01549215
HAdV/WW/K26-2B64/SAU/2022	HAdV/WW/10UA-2B64/SAU/2022	0.01549215
HAdV/Wt/WH2/SAU/2009/41	HAdV/WW/K20-2B64/SAU/2022	0.01550720
HAdV/WW/LMV WW/UK/2022/41	HAdV/WW/K20-2B64/SAU/2022	0.01598700
HAdV/St/SA6749/SAF/2014/41	HAdV/WW/K20-2B64/SAU/2022	0.01941044
HAdV/St/HOUA-GOSH02/UK/2019/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/St/GyK253/SWD/2014/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/St/RVAB/BLG/2011/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/St/F1907/CHN/2019/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/WW/HS12/USA/2009/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/St/503214/IND/2009/41	HAdV/WW/K26-2B64/SAU/2022	0.01941058
HAdV/St/HOUA-GOSH02/UK/2019/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/St/GyK253/SWD/2014/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/St/RVAB/BLG/2011/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/St/F1907/CHN/2019/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/WW/HS12/USA/2009/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/St/503214/IND/2009/41	HAdV/WW/10UA-2B64/SAU/2022	0.01941072
HAdV/Wt/WH2/SAU/2009/41	HAdV/WW/K19-2B64/SAU/2022	0.01941397
HAdV/WW/K23-2B64/SAU/2022	HAdV/WW/10UA-2B64/SAU/2022	0.01941397
HAdV/St/503030/IND/2009/41	HAdV/WW/K19-2B64/SAU/2022	0.01943166
HAdV/St/Tak/JAP/2008/41	HAdV/WW/K19-2B64/SAU/2022	0.01943166
HAdV/St/AD329/BRA/2017/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD11/BRA/2015/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD8325/BRA/2004/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/Wt/IW/SAU/2018/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD178/BRA/2016/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD55/BRA/2015/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD1347/BRA/2012/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD8244/BRA/2004/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD8561/BRA/2005/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/St/AD6301/BRA/2003/41	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/WW/K20-2B64/SAU/2022	HAdV/WW/K23-2B64/SAU/2022	0.01944185
HAdV/WW/K23-2B64/SAU/2022	HAdV/WW/K26-2B64/SAU/2022	0.02335258
HAdV/St/AD5764/BRA/2001/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/St/AD6026/BRA/2002/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/St/AD4578/BRA/1999/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/St/AD01-71218/BRA/2010/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/St/AD102/BRA/2007/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/St/AD454/BRA/2014/41	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/WW/K19-2B64/SAU/2022	HAdV/WW/K23-2B64/SAU/2022	0.02336386
HAdV/Wt/WH2/SAU/2009/41	HAdV/WW/K26-2B64/SAU/2022	0.02336403
HAdV/Wt/WH2/SAU/2009/41	HAdV/WW/10UA-2B64/SAU/2022	0.02336419

HAdV/St/MU35/IRA/2016/41	HAdV/WW/K26-2B64/SAU/2022	0.02336565
HAdV/WW/BEL WW/UK/2022/41	HAdV/WW/K26-2B64/SAU/2022	0.02336565
HAdV/St/503030/IND/2009/41	HAdV/WW/K26-2B64/SAU/2022	0.02336565
HAdV/St/Tak/JAP/2008/41	HAdV/WW/K26-2B64/SAU/2022	0.02336565
HAdV/St/MU35/IRA/2016/41	HAdV/WW/10UA-2B64/SAU/2022	0.02336591
HAdV/WW/BEL WW/UK/2022/41	HAdV/WW/10UA-2B64/SAU/2022	0.02336591
HAdV/St/503030/IND/2009/41	HAdV/WW/10UA-2B64/SAU/2022	0.02336591
HAdV/St/Tak/JAP/2008/41	HAdV/WW/10UA-2B64/SAU/2022	0.02336591
HAdV/Wt/MN1/SAU/2009/41	HAdV/WW/K20-2B64/SAU/2022	0.02336757
HAdV/WW/LF2/SAU/2018/41	HAdV/WW/K23-2B64/SAU/2022	0.02340039
HAdV/Wt/WH1/SAU/2018/41	HAdV/WW/K23-2B64/SAU/2022	0.02340039
HAdV/WW/LMV WW/UK/2022/41	HAdV/WW/K26-2B64/SAU/2022	0.02411588
HAdV/WW/LMV WW/UK/2022/41	HAdV/WW/10UA-2B64/SAU/2022	0.02411613
HAdV/St/SA6749/SAF/2014/41	HAdV/WW/K26-2B64/SAU/2022	0.02732286
HAdV/St/SA6749/SAF/2014/41	HAdV/WW/10UA-2B64/SAU/2022	0.02732314
HAdV/Wt/MN1/SAU/2009/41	HAdV/WW/K19-2B64/SAU/2022	0.02735614
HAdV/WW/LF3/SAU/2018/41	HAdV/WW/K23-2B64/SAU/2022	0.02738334
HAdV/WW/LF5/SAU/2019/41	HAdV/WW/K20-2B64/SAU/2022	0.03130515
HAdV/St/AD99/BRA/2015/40	HAdV/WW/10UA-2B64/SAU/2022	0.03132934
HAdV/St/AD6353/BRA/2003/40	HAdV/WW/10UA-2B64/SAU/2022	0.03132934
HAdV/St/AD6048/BRA/2002/40	HAdV/WW/10UA-2B64/SAU/2022	0.03132934
HAdV/Wt/MN1/SAU/2009/41	HAdV/WW/K26-2B64/SAU/2022	0.03132986
HAdV/Wt/MN1/SAU/2009/41	HAdV/WW/10UA-2B64/SAU/2022	0.03133039
HAdV/St/HOUA-GOSH02/UK/2019/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/St/GyK253/SWD/2014/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/St/RVAB/BLG/2011/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/St/F1907/CHN/2019/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/WW/HS12/USA/2009/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/St/503214/IND/2009/41	HAdV/WW/K23-2B64/SAU/2022	0.03133625
HAdV/St/MU35/IRA/2016/41	HAdV/WW/K23-2B64/SAU/2022	0.03532177
HAdV/WW/BEL WW/UK/2022/41	HAdV/WW/K23-2B64/SAU/2022	0.03532177
HAdV/St/503030/IND/2009/41	HAdV/WW/K23-2B64/SAU/2022	0.03532177
HAdV/St/Tak/JAP/2008/41	HAdV/WW/K23-2B64/SAU/2022	0.03532177
HAdV/WW/LF5/SAU/2019/41	HAdV/WW/K19-2B64/SAU/2022	0.03532485
HAdV/Wt/WH2/SAU/2009/41	HAdV/WW/K23-2B64/SAU/2022	0.03542307
HAdV/WW/LMV WW/UK/2022/41	HAdV/WW/K23-2B64/SAU/2022	0.03646523
HAdV/WW/LF5/SAU/2019/41	HAdV/WW/K26-2B64/SAU/2022	0.03934659
HAdV/WW/LF5/SAU/2019/41	HAdV/WW/10UA-2B64/SAU/2022	0.03934718
HAdV/St/SA6749/SAF/2014/41	HAdV/WW/K23-2B64/SAU/2022	0.03936000
HAdV/St/AD99/BRA/2015/40	HAdV/WW/K20-2B64/SAU/2022	0.03938173
HAdV/St/AD6353/BRA/2003/40	HAdV/WW/K20-2B64/SAU/2022	0.03938173
HAdV/St/AD6048/BRA/2002/40	HAdV/WW/K20-2B64/SAU/2022	0.03938173
HAdV/Wt/MN1/SAU/2009/41	HAdV/WW/K23-2B64/SAU/2022	0.04339944
HAdV/St/AD99/BRA/2015/40	HAdV/WW/K19-2B64/SAU/2022	0.04346988
HAdV/St/AD6353/BRA/2003/40	HAdV/WW/K19-2B64/SAU/2022	0.04346988
HAdV/St/AD6048/BRA/2002/40	HAdV/WW/K19-2B64/SAU/2022	0.04346988
HAdV/St/AD99/BRA/2015/40	HAdV/WW/K26-2B64/SAU/2022	0.04752511
HAdV/St/AD6353/BRA/2003/40	HAdV/WW/K26-2B64/SAU/2022	0.04752511

HAdV/St/AD6048/BRA/2002/40	HAdV/WW/K26-2B64/SAU/2022	0.04752511
HAdV/St/AD99/BRA/2015/40	HAdV/WW/K23-2B64/SAU/2022	0.05157309
HAdV/St/AD6353/BRA/2003/40	HAdV/WW/K23-2B64/SAU/2022	0.05157309
HAdV/St/AD6048/BRA/2002/40	HAdV/WW/K23-2B64/SAU/2022	0.05157309
HAdV/WW/LF5/SAU/2019/41	HAdV/WW/K23-2B64/SAU/2022	0.05158217
HAdV/St/Leipzig/GER/2004/74	HAdV/WW/10UA-2B64/SAU/2022	0.13512609
HAdV/St/Leipzig/GER/2004/74	HAdV/WW/K20-2B64/SAU/2022	0.14450114
HAdV/St/Leipzig/GER/2004/74	HAdV/WW/K19-2B64/SAU/2022	0.14936679
HAdV/St/Leipzig/GER/2004/74	HAdV/WW/K26-2B64/SAU/2022	0.15398542
HAdV/St/Leipzig/GER/2004/74	HAdV/WW/K23-2B64/SAU/2022	0.15839913

The table comprised only sequences having a divergence distance (d) of up to 0.15839913 to our HAdV sequences. Null distances were displayed in red. Moreover, sequences belonging to other isolates and of zero-distance to our isolates were shown in bold and clustered.

Table S4. Full description of sequences used for phylogenetic analysis of human adenovirus isolates.

Accession number	Source	Isolate	Nomination	Country	Type	Year
MW088432	Stool	IAL-AD6026	HAdV/St/AD6026/BRA/2002/41	Brazil	41	2002
MW088401	Stool	IAL-AD4578	HAdV/St/AD4578/BRA/1999/41	Brazil	41	1999
MT341445	Stool	IAL-AD01-71218	HAdV/St/AD01-71218/BRA/2010/41	Brazil	41	2010
MT341369	Stool	IAL-AD102	HAdV/St/AD102/BRA/2007/41	Brazil	41	2007
MH223623	Stool	IAL-AD178	HAdV/St/AD178/BRA/2016/41	Brazil	41	2016
MH201101	Stool	IAL-AD55	HAdV/St/AD55/BRA/2015/41	Brazil	41	2015
MH152672	Stool	IAL-AD1347	HAdV/St/AD1347/BRA/2012/41	Brazil	41	2012
MW088491	Stool	IAL-AD8244	HAdV/St/AD8244/BRA/2004/41	Brazil	41	2004
MW088442	Stool	IAL-AD8561	HAdV/St/AD8561/BRA/2005/41	Brazil	41	2005
MW088438	Stool	IAL-AD6301	HAdV/St/AD6301/BRA/2003/41	Brazil	41	2003
MH168367	Stool	IAL-AD454	HAdV/St/AD454/BRA/2014/41	Brazil	41	2014
MG925783	Stool	MU35	HAdV/St/MU35/IRA/2016/41	Iraq	41	2016
ON923977	Wastewater	BEL_WW	HAdV/WW/BEL_WW/UK/2022/41	United Kingdom	41	2022
MK962807	Stool	SA6749	HAdV/St/SA6749/SAF/2014/41	South Africa	41	2009/2014
KX868523	Stool	GyK253	HAdV/St/GyK253/SWD/2014/41	Sweden	41	2000
MZ603083	Stool	HAdV-41 RVAB	HAdV/St/RVAB/BLG/2011/41	Belgium	41	2011
MT150513	Stool	F1907/Beijing/07/2019	HAdV/St/F1907/CHN/2019/41	China	41	2019
JF699082	Raw sewage	HS12	HAdV/WW/HS12/USA/2009/41	USA	41	2009
HQ005289	Stool	503214/KOL/2009	HAdV/St/503214/IND/2009/41	India	41	2009
MW936370	water	WH2_HAdV_2018	HAdV/Wt/WH2/SAU/2009/41	Saudi Arabia	41	2021
HQ005282	Stool	503030/KOL/2009	HAdV/St/503030/IND/2009/41	India	41	2009
AB330122	Stool	Tak	HAdV/St/Tak/JAP/2008/41	Japan	41	2008
MW936376	water	MN1_HAdV_2018	HAdV/Wt/MN1/SAU/2009/41	Saudi Arabia	41	2018
MH201117	Stool	IAL-AD99/15	HAdV/St/AD99/BRA/2015/40	Brazil	40	2015
MW088378	Stool	IAL-AD6353	HAdV/St/AD6353/BRA/2003/40	Brazil	40	2003
MW088370	Stool	IAL-AD6048	HAdV/St/AD6048/BRA/2002/40	Brazil	40	2002
KY618677	Stool	human/DEU/Leipzig/2015/74[P70H74F51]	HAdV/St/Leipzig/GER/2004/74	Germany	74	2015
MH251892	Stool	AD329	HAdV/St/AD329/BRA/2017/41	Brazil	41	2017
MH201097	Stool	AD11	HAdV/St/AD11/BRA/2015/41	Brazil	41	2015
MW088519	Stool	AD8325	HAdV/St/AD8325/BRA/2004/41	Brazil	41	2004
MW936375	Irrigation water	IW	HAdV/Wt/IW/SAU/2018/41	Saudi Arabia	41	2018
MW936378	Landfill wastewater	LF2	HAdV/WW/LF2/SAU/2018/41	Saudi Arabia	41	2018
MW936369	Surface water (Lake)	WH1	HAdV/Wt/WH1/SAU/2018/41	Saudi Arabia	41	2018
MW936379	Landfill wastewater	LF3	HAdV/WW/LF3/SAU/2018/41	Saudi Arabia	41	2018
MW936381	Landfill wastewater	LF5	HAdV/WW/LF5/SAU/2019/41	Saudi Arabia	41	2019
ON923973	Wastewater	LMV_WW	HAdV/WW/LMV_WW/UK/2022/41	United Kingdom	41	2022
OP174922	Stool	HOUA-GOSH02	HAdV/St/HOUA-GOSH02/UK/2019/41	United Kingdom	41	2019
MW088429	stool	IAL-AD5764	HAdV/St/AD5764/BRA/2001/41	Brazil	41	2001