

Supplementary

Table S1 Dominantly circulated influenza viruses based on the Korea Disease Control and Prevention Agency surveillance reports during the study period in Korea

Influenza season	2014–2015 season	2015–2016 season	2016–2017 season	2017–2018 season	2018–2019 season
Influenza A virus	63%	49%	73%	45%	63%
Influenza A(H3N2)	83%	10%	99%	85%	67%
Influenza A(H1N1)pdm09	17%	90%	1%	15%	33%
Influenza B virus	37%	51%	27%	55%	37%
Influenza B/Yamagata	100%	3%	Unknown	99%	1%
Influenza B/Victoria	0%	97%	Unknown	1%	99%

Table S2 Comparison of clinical features and outcomes by the influenza virus type/subtype/lineage in patients aged 0-2 years

Factor	Influenza A group (n=430)				Influenza B group (n=186)				P [†]
	Total	A(H3N2) season (n=250)	A(H1N1)pdm09 season (n=113)	P [‡]	Total	B/Yamagata season (n=84)	B/Victoria season (n=86)	P [§]	
Male sex	235 (54.7)	141 (56.4)	57 (50.4)	0.307	111 (59.7)	53 (63.1)	46 (53.5)	0.217	0.252
Underlying disease	5 (1.2)	2 (0.8)	2 (1.8)	0.591	1 (0.5)	0 (0.0)	1 (1.2)	1.000	0.674
Clinical diagnoses				0.149				0.384	0.034
Upper respiratory tract infection	345 (80.2)	206 (82.4)	89 (78.8)		136 (73.1)	67 (79.8)	63 (73.3)		
Lower respiratory tract infection	77 (17.9)	39 (15.6)	24 (21.2)		48 (25.8)	16 (19.0)	22 (25.6)		
Fever without a focus	8 (1.9)	5 (2.0)	0 (0.0)		1 (0.5)	0 (0.0)	1 (1.2)		
Acute gastroenteritis	0 (0.0)	0 (0.0)	0 (0.0)		1 (0.5)	1 (1.2)	0 (0.0)		
Clinical symptoms									
Fever	429 (99.8)	249 (99.6)	113 (100.0)	1.000	185 (99.5)	84 (100.0)	86 (100.0)	NA	0.513
Respiratory symptoms, any	392 (91.2)	228 (91.2)	106 (93.8)	0.531	176 (94.6)	78 (92.9)	82 (95.3)	0.533	0.189
Cough	351 (81.6)	204 (81.6)	98 (86.7)	0.289	155 (83.3)	69 (82.1)	70 (81.4)	1.000	0.648
Rhinorrhea	329 (76.5)	196 (78.4)	83 (73.5)	0.347	156 (83.9)	70 (83.3)	72 (83.7)	1.000	0.042
Sputum	184 (42.8)	98 (39.2)	55 (48.7)	0.108	101 (54.3)	45 (53.6)	43 (50.0)	0.649	0.011
Sore throat	14(3.3)	9 (3.6)	3 (2.7)	0.761	5 (2.7)	3 (3.6)	2 (2.3)	0.680	0.805
Dyspnea	11 (2.6)	5 (2.0)	2 (1.8)	1.000	1 (0.5)	1 (1.2)	0 (0.0)	0.494	0.119
Gastrointestinal symptoms, any	77 (17.9)	51 (20.4)	16 (14.2)	0.189	32 (17.2)	15 (17.9)	15 (17.4)	1.000	0.909
Vomiting	51 (11.9)	35 (14.0)	12 (10.6)	0.405	17 (9.1)	8 (9.5)	7 (8.1)	0.793	0.401
Abdominal pain	11 (2.6)	9 (3.6)	2 (1.8)	0.514	6 (3.2)	3 (3.6)	3 (3.5)	1.000	0.603
Diarrhea	27 (6.3)	14 (5.6)	5 (4.4)	0.801	13 (7.0)	5 (6.0)	7 (8.1)	0.766	0.725
Headache	5 (1.2)	2 (0.8)	2 (1.8)	0.591	1 (0.5)	0 (0.0)	1 (1.2)	1.000	0.674
Myalgia	0 (0.0)	0 (0.0)	0 (0.0)	NA	1 (0.5)	0 (0.0)	1 (1.2)	1.000	0.302
Seizure activity	29 (6.7)	23 (9.2)	4 (3.5)	0.082	12 (6.5)	10 (11.9)	1 (1.2)	0.005	1.000
Antiviral therapy	344 (80.0)	195 (78.0)	98 (86.7)	0.061	153 (82.3)	71 (84.5)	70 (81.4)	0.685	0.579
Outcomes									
Hospitalization	125 (29.1)	74 (29.6)	29 (25.7)	0.530	79 (42.5)	34 (40.5)	32 (37.2)	0.753	0.001
Oxygen therapy	1 (0.2)	1 (0.4)	0 (0.0)	1.000	0 (0.0)	0 (0.0)	0 (0.0)	NA	1.000
Mechanical ventilation	0 (0.0)	0 (0.0)	0 (0.0)	NA	0 (0.0)	0 (0.0)	0 (0.0)	NA	NA
Acute otitis media	18 (4.2)	9 (3.6)	7 (6.2)	0.277	8 (4.3)	5 (6.0)	2 (2.3)	0.274	1.000
Sinusitis	2 (0.5)	2 (0.8)	0 (0.0)	1.000	1 (0.5)	0 (0.0)	1 (1.2)	1.000	1.000

[†], Comparison between the influenza A and B groups; [‡], Comparison between the A(H3N2) and A(H1N1)pdm09 seasons; [§], Comparison between the B/Yamagata and B/Victoria seasons; NA, not applicable.

Table S3 Comparison of clinical features and outcomes by the influenza virus type/subtype/lineage in patients aged 3–6 years

Factor	Influenza A group (n=549)				Influenza B group (n=385)				P [†]
	Total	A(H3N2) season (n=332)	A(H1N1)pdm09 season (n=128)	P [‡]	Total	B/Yamagata season (n=139)	B/Victoria season (n=153)	P [§]	
Male sex	309 (56.3)	185 (55.7)	73 (57.0)	0.834	214 (55.6)	79 (56.8)	84 (54.9)	0.814	0.841
Underlying disease	13 (2.4)	8 (2.4)	1 (0.8)	0.455	6 (1.6)	2 (1.4)	2 (1.3)	1.000	0.484
Clinical diagnoses				0.096				0.310	0.620
Upper respiratory tract infection	478 (87.1)	298 (89.8)	108 (84.4)		334 (86.8)	119 (85.6)	135 (88.2)		
Lower respiratory tract infection	61 (11.1)	26 (7.8)	18 (14.1)		47 (12.2)	18 (12.9)	18 (11.8)		
Fever without a focus	5 (0.9)	5 (1.5)	0 (0.0)		3 (0.8)	2 (1.4)	0 (0.0)		
Acute gastroenteritis	5 (0.9)	3 (0.9)	2 (1.6)		1 (0.3)	0 (0.0)	0 (0.0)		
Clinical symptoms									
Fever	549 (100.0)	332 (100.0)	128 (100.0)	NA	384 (99.7)	139 (100.0)	152 (99.3)	1.000	0.412
Respiratory symptoms, any	500 (91.1)	297 (89.5)	118 (92.2)	0.484	363 (94.3)	132 (95.0)	148 (96.7)	0.559	0.079
Cough	457 (83.2)	271 (81.6)	108 (84.4)	0.585	330 (85.7)	119 (85.6)	138 (90.2)	0.280	0.317
Rhinorrhea	365 (66.5)	215 (64.8)	79 (61.7)	0.588	258 (67.0)	100 (71.9)	107 (69.9)	0.797	0.888
Sputum	253 (46.1)	155 (46.7)	57 (44.5)	0.754	156 (40.5)	58 (41.7)	61 (39.9)	0.812	0.094
Sore throat	55 (10.0)	37 (11.1)	11 (8.6)	0.498	65 (16.9)	22 (15.8)	28 (18.3)	0.642	0.003
Dyspnea	3 (0.5)	1 (0.3)	1 (0.8)	0.480	3 (0.8)	0 (0.0)	1 (0.7)	1.000	0.695
Gastrointestinal symptoms, any	120 (21.9)	64 (19.3)	31 (24.2)	0.249	79 (20.5)	28 (20.1)	30 (19.6)	1.000	0.685
Vomiting	72 (13.1)	39 (11.7)	19 (14.8)	0.433	41 (10.6)	15 (10.8)	14 (9.2)	0.698	0.264
Abdominal pain	64 (11.7)	30 (9.0)	18 (14.1)	0.126	52 (13.5)	20 (14.4)	20 (13.1)	0.865	0.421
Diarrhea	19 (3.5)	9 (2.7)	5 (3.9)	0.547	11 (2.9)	5 (3.6)	2 (1.3)	0.263	0.708
Headache	29 (5.3)	19 (5.7)	4 (3.1)	0.342	23 (6.0)	8 (5.8)	9 (5.9)	1.000	0.666
Myalgia	24 (4.4)	16 (4.8)	2 (1.6)	0.176	14 (3.6)	3 (2.2)	8 (5.2)	0.224	0.618
Seizure activity	27 (4.9)	16 (4.8)	3 (2.3)	0.302	9 (2.3)	1 (0.7)	8 (5.2)	0.038	0.056
Antiviral therapy	447 (81.4)	255 (76.8)	114 (89.1)	0.003	317 (82.3)	118 (84.9)	128 (83.7)	0.872	0.731
Outcomes									
Hospitalization	117 (21.3)	74 (22.3)	25 (19.5)	0.613	74 (19.2)	22 (15.8)	33 (21.6)	0.233	0.459
Oxygen therapy	1 (0.2)	0 (0.0)	1 (0.8)	0.278	0 (0.0)	0 (0.0)	0 (0.0)	NA	1.000
Mechanical ventilation	0 (0.0)	0 (0.0)	0 (0.0)	NA	0 (0.0)	0 (0.0)	0 (0.0)	NA	NA
Acute otitis media	7 (1.3)	3 (0.9)	1 (0.8)	1.000	6 (1.6)	1 (0.7)	4 (2.6)	0.374	0.780
Sinusitis	2 (0.4)	0 (0.0)	1 (0.8)	0.278	2 (0.5)	1 (0.7)	1 (0.7)	1.000	1.000

[†], comparison between the influenza A and B groups; [‡], Comparison between the A(H3N2) and A(H1N1)pdm09 seasons; [§], comparison between the B/Yamagata and B/Victoria seasons. NA, not applicable.

Table S4 Comparison of clinical features and outcomes by the influenza virus type/subtype/lineage in patients aged 7-12 years

Factor	Influenza A group (n=413)				Influenza B (n=288)				P [†]
	Total	A(H3N2) season (n=248)	A(H1N1)pdm09 season (n=69)	P ^{b‡}	Total	B/Yamagata season (n=131)	B/Victoria season (n=96)	P [§]	
Male sex	223 (54.0)	125 (50.4)	41 (59.4)	0.220	147 (51.0)	75 (57.3)	51 (53.1)	0.589	0.443
Underlying disease	10 (2.4)	5 (2.0)	2 (2.9)	0.649	8 (2.8)	4 (3.1)	1 (1.0)	0.399	0.811
Clinical diagnoses				0.761				0.518	0.654
Upper respiratory tract infection	381 (92.3)	228 (91.9)	64 (92.8)		260 (90.3)	115 (87.8)	86 (89.6)		
Lower respiratory tract infection	26 (6.3)	16 (6.5)	5 (7.2)		25 (8.7)	12 (9.2)	9 (9.4)		
Fever without a focus	2 (0.5)	2 (0.8)	0 (0.0)		1 (0.3)	1 (0.8)	1 (1.0)		
Acute gastroenteritis	4 (1.0)	2 (0.8)	0 (0.0)		2 (0.7)	3 (2.3)	0 (0.0)		
Clinical symptoms									
Fever	412 (99.8)	247 (99.6)	69 (100.0)	1.000	287 (99.7)	131 (100.0)	96 (100.0)	NA	1.000
Respiratory symptoms, any	391 (94.7)	234 (94.4)	67 (97.1)	0.537	271 (94.1)	123 (93.9)	89 (92.7)	0.790	0.741
Cough	349 (84.5)	207 (83.5)	59 (85.5)	0.853	243 (84.4)	108 (82.4)	78 (81.3)	0.862	1.000
Rhinorrhea	242 (58.6)	151 (60.9)	36 (52.2)	0.214	171 (59.4)	87 (66.4)	51 (53.1)	0.054	0.876
Sputum	162 (39.2)	99 (39.9)	27 (39.1)	1.000	112 (38.9)	54 (41.2)	34 (35.4)	0.410	0.937
Sore throat	114 (27.6)	61 (24.6)	21 (30.4)	0.352	88 (30.6)	30 (22.9)	20 (20.8)	0.748	0.398
Dyspnea	3 (0.7)	2 (0.8)	0 (0.0)	1.000	1 (0.3)	2 (1.5)	1 (1.0)	1.000	0.648
Gastrointestinal symptoms, any	74 (17.9)	40 (16.1)	15 (21.7)	0.284	49 (17.0)	26 (19.8)	24 (25.0)	0.418	0.840
Vomiting	50 (12.1)	27 (10.9)	10 (14.5)	0.402	30 (10.4)	17 (13.0)	15 (15.6)	0.570	0.547
Abdominal pain	34 (8.2)	16 (6.5)	7 (10.1)	0.299	22 (7.6)	13 (9.9)	13 (13.5)	0.407	0.888
Diarrhea	7 (1.7)	4 (1.6)	1 (1.4)	1.000	9 (3.1)	6 (4.6)	2 (2.1)	0.472	0.304
Headache	82 (19.9)	46 (18.5)	16 (23.2)	0.394	54 (18.8)	18 (13.7)	10 (10.4)	0.542	0.771
Myalgia	28 (6.8)	23 (9.3)	0 (0.0)	0.006	26 (9.0)	8 (6.1)	2 (2.1)	0.197	0.314
Seizure activity	7 (1.7)	5 (2.0)	0 (0.0)	0.589	2 (0.7)	0 (0.0)	2 (2.1)	0.178	0.321
Antiviral therapy	308 (74.6)	186 (75.0)	57 (82.6)	0.202	226 (78.5)	100 (76.3)	72 (75.0)	0.876	0.243
Outcomes									
Hospitalization	83 (20.1)	53 (21.4)	14 (20.3)	1.000	53 (18.4)	24 (18.3)	20 (20.8)	0.734	0.628
Oxygen therapy	1 (0.2)	0 (0.0)	0 (0.0)	NA	0 (0.0)	0 (0.0)	0 (0.0)	NA	1.000
Mechanical ventilation	0 (0.0)	0 (0.0)	0 (0.0)	NA	0 (0.0)	0 (0.0)	0 (0.0)	NA	NA
Acute otitis media	0 (0.0)	0 (0.0)	0 (0.0)	NA	1 (0.3)	0 (0.0)	1 (1.0)	0.423	0.411
Sinusitis	2 (0.5)	2 (0.8)	0 (0.0)	1.000	0 (0.0)	0 (0.0)	0 (0.0)	NA	0.515

[†], comparison between the influenza A and B groups; [‡], comparison between the A(H3N2) and A(H1N1)pdm09 seasons; [§], comparison between the B/Yamagata and B/Victoria seasons. NA, not applicable.

Table S5 Comparison of clinical features and outcomes by the influenza virus type/subtype/lineage in patients aged 13–19 years

Factor	Influenza A group (n=196)				Influenza B group (n=105)				P [†]
	Total	A(H3N2) season (n=118)	A(H1N1)pdm09 season (n=32)	P [‡]	Total	B/Yamagata season (n=128)	B/Victoria season (n=101)	P [§]	
Male sex	89 (45.4)	55 (46.6)	11 (34.4)	0.235	59 (43.8)	59 (46.1)	44 (43.6)	0.789	0.809
Underlying disease	11 (5.6)	7 (5.9)	2 (6.3)	1.000	4 (3.8)	1 (0.8)	8 (7.9)	0.012	0.588
Clinical diagnoses				0.135				0.450	0.009
Upper respiratory tract infection	192 (98.0)	116 (98.3)	30 (93.8)		95 (90.5)	117 (91.4)	94 (93.1)		
Lower respiratory tract infection	3 (1.5)	2 (1.7)	1 (3.1)		8 (7.6)	9 (7.0)	7 (6.9)		
Fever without a focus	1 (0.5)	0 (0.0)	1 (3.1)		0 (0.0)	0 (0.0)	0 (0.0)		
Acute gastroenteritis	0 (0.0)	0 (0.0)	0 (0.0)		2 (1.9)	2 (1.6)	0 (0.0)		
Clinical symptoms									
Fever	192 (98.0)	118 (100.0)	32 (100.0)	NA	103 (98.1)	125 (97.7)	101 (100.0)	0.257	1.000
Respiratory symptoms, any	189 (96.4)	113 (95.8)	31 (96.9)	1.000	101 (96.2)	120 (93.8)	95 (94.1)	1.000	1.000
Cough	165 (84.2)	97 (82.2)	25 (78.1)	0.613	88 (83.8)	111 (86.7)	84 (83.2)	0.461	1.000
Rhinorrhea	107 (54.6)	65 (55.1)	13 (40.6)	0.166	68 (64.8)	74 (57.8)	63 (62.4)	0.500	0.111
Sputum	87 (44.4)	46 (39.0)	15 (46.9)	0.426	50 (47.6)	55 (43.0)	44 (43.6)	1.000	0.628
Sore throat	87 (44.4)	49 (41.5)	14 (43.8)	0.842	54 (51.4)	60 (46.9)	41 (40.6)	0.352	0.276
Dyspnea	4 (2.0)	3 (2.5)	1 (3.1)	1.000	0 (0.0)	0 (0.0)	0 (0.0)	NA	0.302
Gastrointestinal symptoms, any	30 (15.3)	16 (13.6)	7 (21.9)	0.272	19 (18.1)	21 (16.4)	14 (13.9)	0.712	0.623
Vomiting	18 (9.2)	7 (5.9)	6 (18.8)	0.033	9 (8.6)	12 (9.4)	5 (5.0)	0.310	1.000
Abdominal pain	12 (6.1)	8 (6.8)	1 (3.1)	0.685	10 (9.5)	10 (7.8)	5 (5.0)	0.432	0.353
Diarrhea	6 (3.1)	3 (2.5)	2 (6.3)	0.289	5 (4.8)	5 (3.9)	5 (5.0)	0.753	0.524
Headache	55 (28.1)	32 (27.1)	8 (25.0)	1.000	33 (31.4)	38 (29.7)	25 (24.8)	0.457	0.595
Myalgia	55 (28.1)	30 (25.4)	9 (28.1)	0.821	4,298 (27.6)	35 (27.3)	12 (11.9)	0.005	1.000
Seizure activity	0 (0.0)	0 (0.0)	0 (0.0)	NA	1 (1.0)	1 (0.8)	0 (0.0)	1.000	0.349
Antiviral therapy	152 (77.6)	86 (72.9)	28 (87.5)	0.105	81 (77.1)	104 (81.3)	77 (76.2)	0.414	1.000
Outcomes									
Hospitalization	24 (12.2)	18 (15.3)	3 (9.4)	0.568	16 (15.2)	19 (14.8)	18 (17.8)	0.590	0.480
Oxygen therapy	2 (1.0)	1 (0.8)	1 (3.1)	0.382	0 (0.0)	0 (0.0)	0 (0.0)	NA	0.544
Mechanical ventilation	1 (0.5)	0 (0.0)	1 (3.1)	0.213	0 (0.0)	0 (0.0)	0 (0.0)	NA	1.000
Acute otitis media	0 (0.0)	0 (0.0)	0 (0.0)	NA	0 (0.0)	1 (0.8)	0 (0.0)	1.000	NA
Sinusitis	24 (1.0)	1 (0.8)	1 (3.1)	0.382	3 (2.9)	2 (1.6)	0 (0.0)	0.505	0.232

[†], comparison between the influenza A and B groups; [‡], comparison between the A(H3N2) and A(H1N1)pdm09 seasons; [§], comparison between the B/Yamagata and B/Victoria seasons. NA, not applicable.