

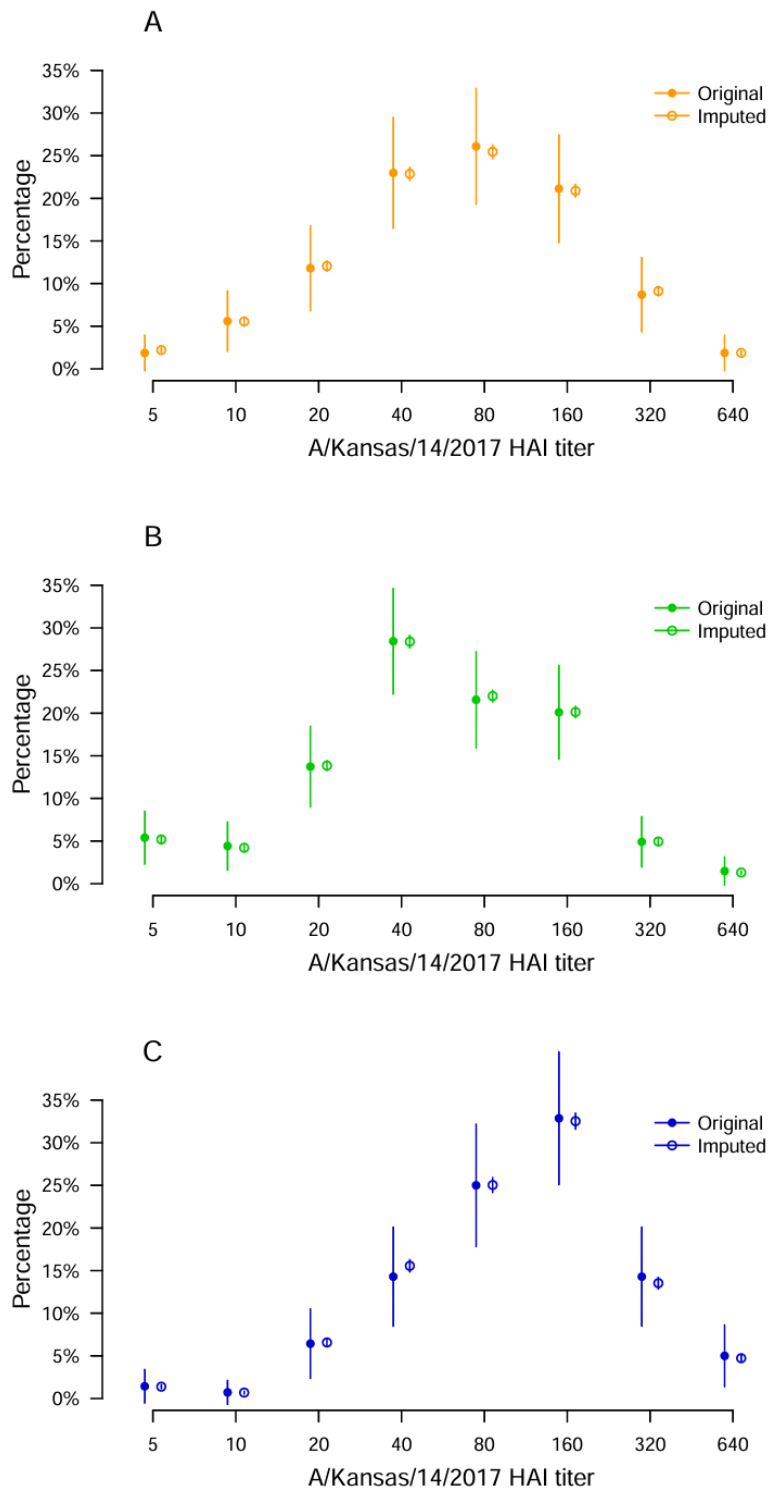


Figure S1. Comparing the distribution of hemagglutination inhibition (HAI) antibody titers between original and imputed data for (A) egg-based inactivated influenza vaccines (eIIIV4), (B) cell-based inactivated influenza vaccines (cIIIV4) and (C) recombinant influenza vaccines (RIV4). The solid points represented the percentage of original titers and hollow points represented the percentage of titers after multiple imputation. Vertical lines showed the 95% confidence intervals of the proportions.

Table S1. Baseline characteristics and infections of participants with microneutralization antibody titers (n = 697)

	Combined eIIIV4 n = 226 n (%)	cclIV4 n = 278 n (%)	RIV4 n = 193 n (%)	P value[^]
Demographic characteristics				
Age, mean (SD)	44 (11.0)	44 (10.8)	43 (11.6)	0.514
Female	198 (87.6)	227 (81.7)	149 (77.2)	0.052
Baseline health conditions				
Underlying medical conditions	39 (17.3)	34 (12.2)	33 (17.1)	0.204
Smoker	4 (1.8)	11 (4.0)	12 (6.2)	0.063
Number of vaccines received during the preceding 5 seasons*				
5	145 (64.2)	192 (69.1)	105 (54.4)	<0.001
4	24 (10.6)	25 (9.0)	23 (11.9)	
3	19 (8.4)	27 (9.7)	20 (10.4)	
2	14 (6.2)	14 (5.0)	13 (6.7)	
1	8 (3.5)	8 (2.9)	26 (13.5)	
0	16 (7.1)	12 (4.3)	6 (3.1)	
Laboratory-confirmed illnesses or symptomatic infections (n, %)				
Influenza A(H1N1)	2 (0.9)	3 (1.1)	4 (2.1)	0.518
Influenza A(H3N2)	3 (1.3)	9 (3.2)	2 (1.0)	0.166
Unsubtypeable influenza A	0 (0.0)	1 (0.4)	1 (0.5)	0.588

P values were obtained by chi-squared tests for categorical variables, ANOVA tests for normally-distributed variables;

* Vaccination history verified by electronic medical record;

Abbreviations: eIIIV4 = egg-based quadrivalent inactivated influenza vaccine; cclIV4 = cell-culture based quadrivalent inactivated influenza vaccine; RIV4 = recombinant quadrivalent inactivated influenza vaccine.

Table S2. Baseline characteristics and infections of participants with hemagglutination inhibition antibody titers (n = 505)

	Combined eIIV4 n = 161 n (%)	cclIV4 n = 204 n (%)	RIV4 n = 140 n (%)	P value[^]
Demographic characteristics				
Age, mean (SD)	44 (10.7)	44 (10.9)	45 (11.1)	0.843
Female	143 (88.8)	166 (81.4)	106 (75.7)	0.011
Baseline health conditions				
Underlying medical conditions	30 (18.6)	27 (13.2)	26 (18.6)	0.279
Smoker	3 (1.9)	9 (4.4)	7 (5.0)	0.296
Number of vaccines received during the preceding 5 seasons*				
5	114 (70.8)	153 (75.0)	82 (58.6)	0.008
4	16 (9.9)	14 (6.9)	14 (10.0)	
3	11 (6.8)	16 (7.8)	14 (10.0)	
2	9 (5.6)	11 (5.4)	8 (5.7)	
1	6 (3.7)	6 (2.9)	19 (13.6)	
0	5 (3.1)	4 (2.0)	3 (2.1)	
Laboratory-confirmed illnesses or symptomatic infections (n, %)				
Influenza A(H1N1)	1 (0.6)	3 (1.5)	2 (1.4)	0.732
Influenza A(H3N2)	3 (1.9)	5 (2.5)	2 (1.4)	0.793
Unsubtypeable influenza A	0 (0.0)	1 (0.5)	1 (0.7)	0.593

P values were obtained by chi-squared tests for categorical variables, ANOVA tests for normally-distributed variables;

* Vaccination history verified by electronic medical record;

Abbreviations: eIIV4 = egg-based quadrivalent inactivated influenza vaccine; cclIV4 = cell-culture based quadrivalent inactivated influenza vaccine; RIV4 = recombinant quadrivalent inactivated influenza vaccine.

Table S3. Subclades of virus isolates from laboratory-confirmed influenza A(H3N2) illnesses with sequencing performed (n=9)

	Combined eIV4	ccIV4	RIV4	P value^
	n = 226	n = 279	n = 195	
	n (%)	n (%)	n (%)	
3C.2a1b	0 (0.0)	3 (1.1)	0 (0.0)	0.377
3C.3a	3 (1.3)	2 (0.7)	1 (0.5)	

Notes:

1. P-value was obtained by Fisher's exact test;
2. The influenza A(H3N2) vaccine strain for the Northern Hemisphere 2018/19 influenza vaccine (A/Singapore/INFIMH-16-0019/2016) belonged to the 3C.2a1b subclade, and the influenza A(H3N2) vaccine strain for the Northern Hemisphere 2019/20 influenza vaccine (A/Kansas/14/2017) belonged to the 3C.3a subclade. During the 2018/19 influenza season, influenza A(H3N2) viruses of multiple subclades co-circulated in the United States. However, influenza A(H3N2) viruses from the 3C3a subclade predominated.
3. Abbreviations: eIV4 = egg-based quadrivalent inactivated influenza vaccine; ccIV4 = cell culture-based quadrivalent inactivated influenza vaccine; RIV4 = recombinant quadrivalent inactivated influenza vaccine.