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Occupationally Exposed and General Population Antibody Profiles to Influenza A Viruses Circulating in Swine as Indication of Zoonotic Risk

Appendix

Appendix Table 1. Odds ratios and 95% confidence intervals for associations with seropositivity to influenza A virus H1 and H3 lineages in swine. Statistically significant p-values (<0.05) are highlighted in bold.

Variable	H1 1A		H1 1B		H3	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
General population cohorts	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Occupational exposure cohorts	0.96 (0.53–1.73)	0.899	0.23 (0.11–0.48)	<0.001	0.17 (0.05–0.44)	<0.001
Born 1946–1977	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Born 1978–2003	1.94 (1.04–3.66)	0.038	3.47 (1.52–9.06)	0.002	2.35 (1.06–5.22)	0.036
male	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
female	1.65 (0.91–3.01)	0.098	1.92 (0.99–3.79)	0.054	3.49 (1.48–9.32)	0.004
Non-vaccinated	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Vaccinated	5.30 (2.56–11.32)	<0.001	5.48 (2.15–17.17)	<0.001	14.44 (5.33–47.30)	<0.001

Appendix Table 2. Odds Ratios and 95% Confidence Intervals for Seropositivity to Individual H1 1B Swine Influenza A Virus Strains. Statistically significant p-values (<0.05) are highlighted in bold.

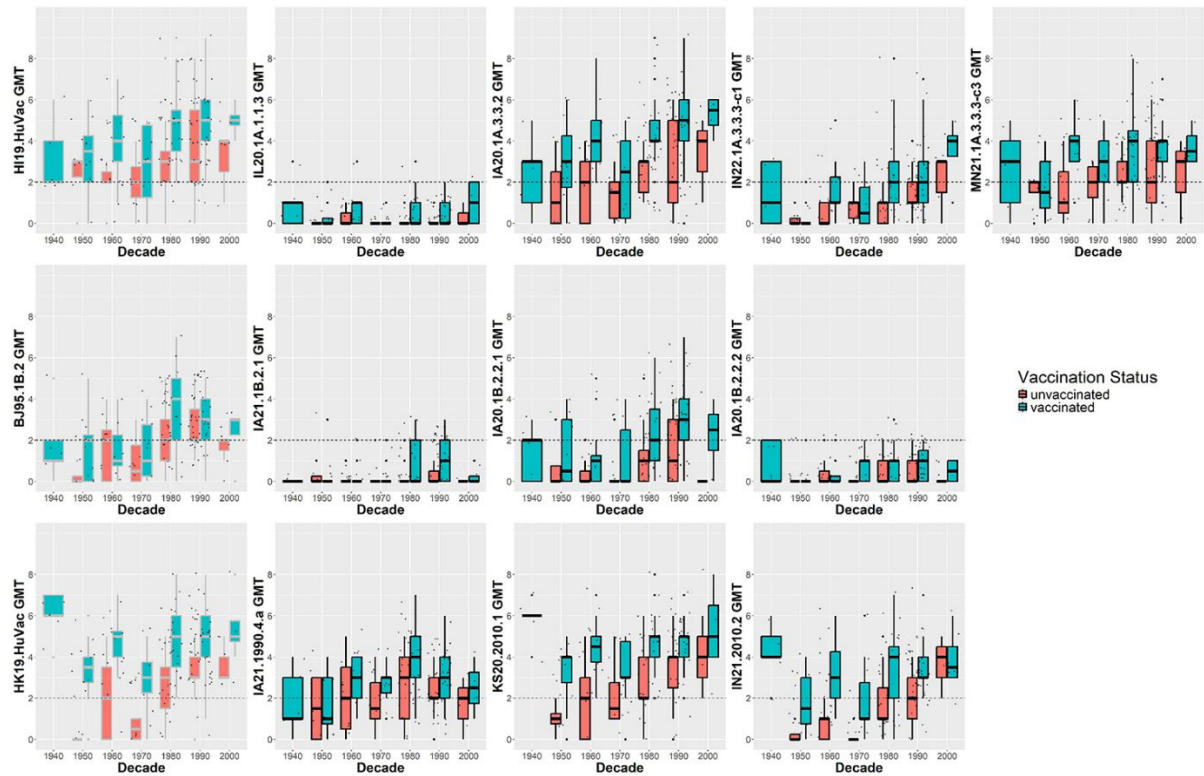
Variable	IA21.1B.2.1		IA20.1B.2.2.1		IA20.1B.2.2.2	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
General population cohorts	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Occupational exposure cohorts	0.22 (0.08–0.53)	<0.001	0.24 (0.13–0.44)	<0.001	1.05 (0.45–2.48)	0.903
Born 1946–1977	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Born 1978–2003	4.80 (1.59–21.60)	0.004	2.69 (1.41–5.28)	0.003	1.04 (0.43–2.72)	0.928
male	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
female	1.64 (0.74–3.69)	0.220	1.97 (1.10–3.56)	0.023	0.70 (0.29–1.62)	0.403
Non-vaccinated	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Vaccinated	5.17 (1.68–23.48)	0.003	3.42 (1.67–7.34)	0.001	2.30 (0.86–7.42)	0.100

Appendix Table 3. Odds Ratios and 95% Confidence Intervals for Seropositivity to Individual H3 Swine Influenza A Virus Strains. Statistically significant p-values (<0.05) are highlighted in bold.

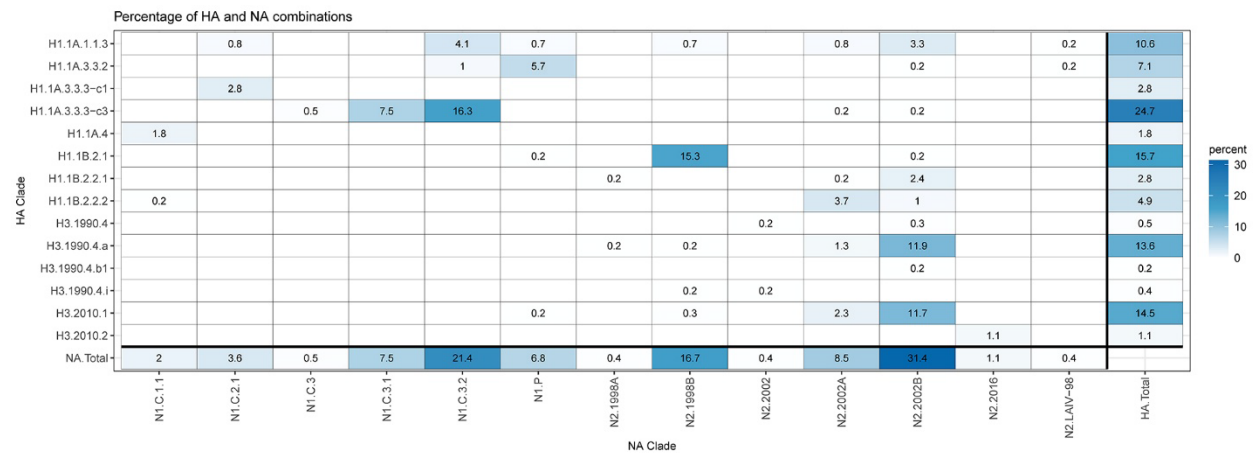
Variable	IA21.1990.4.a		KS20.2010.1		IN21.2010.2	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
General population cohorts	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Occupational exposure cohorts	1.16 (0.61–2.22)	0.651	0.06 (0.00–0.29)	<0.001	0.14 (0.06–0.31)	<0.001
Born 1946–1977	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Born 1978–2003	3.04 (1.55–6.00)	0.001	2.10 (0.78–5.59)	0.140	2.31 (1.18–4.51)	0.015
male	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
female	1.39 (0.72–2.69)	0.325	5.03 (1.58–23.22)	0.005	4.22 (2.08–9.11)	<0.001
Non-vaccinated	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Vaccinated	2.36 (1.08–5.19)	0.032	13.22 (4.02–62.48)	<0.001	5.85 (2.79–12.70)	<0.001

Appendix Table 4. Odds Ratios and 95% Confidence Intervals for Seropositivity to Individual H1 1A Swine Influenza A Virus Strains. Statistically significant p-values (<0.05) are highlighted in bold.

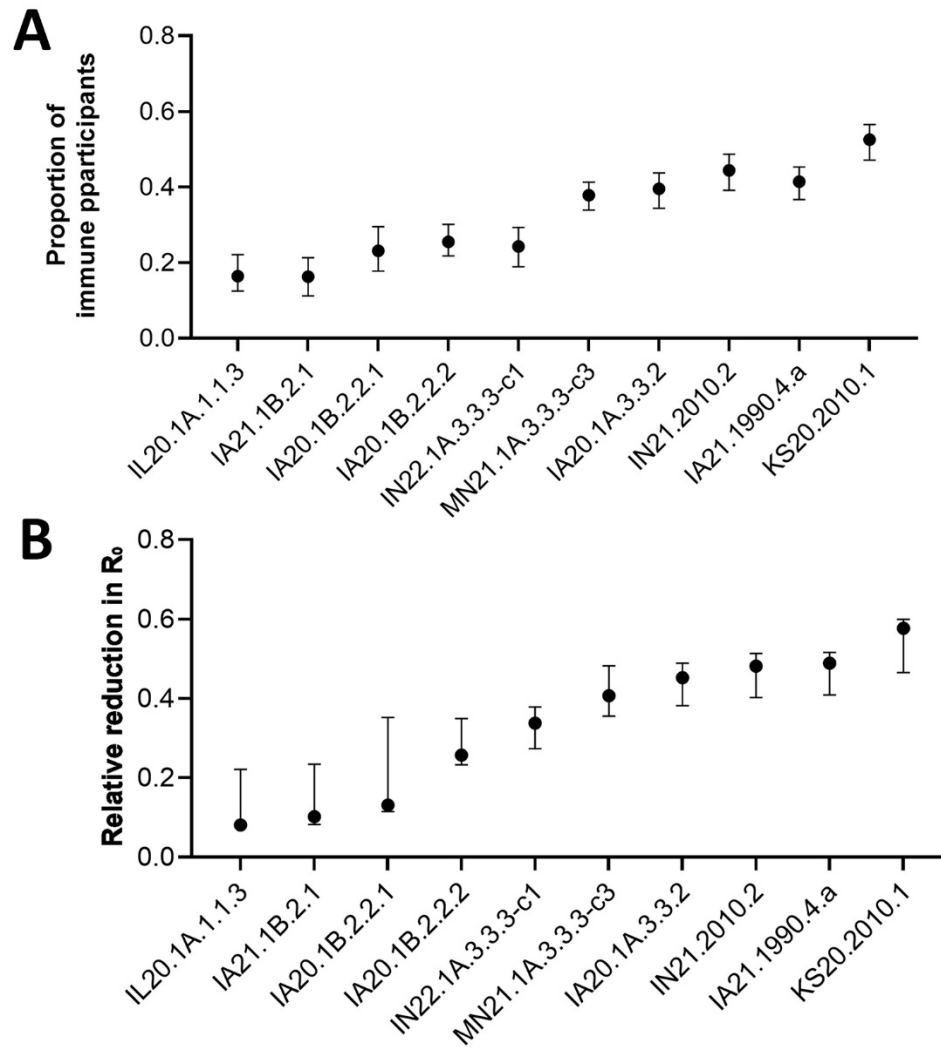
Variable	IL20.1A.1.1.3		IA20.1A.3.3.2		IN22.1A.3.3.3-c1		MN21.1A.3.3.3-c3	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
General population cohorts	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Occupational exposure cohorts	0.54 (0.10–2.34)	0.409	0.87 (0.44–1.69)	0.681	0.84 (0.46–1.54)	0.581	1.36 (0.72–2.59)	0.348
Born 1946–1977	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Born 1978–2003	0.75 (0.17–4.01)	0.715	1.48 (0.73–2.96)	0.271	4.05 (1.94–9.18)	<0.001	2.31 (1.18–4.51)	0.015
male	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
female	3.48 (0.75–26.88)	0.115	1.73 (0.88–3.49)	0.113	1.53 (0.84–2.80)	0.169	1.17 (0.62–2.25)	0.630
Non-vaccinated	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-	1.00 (Referent)	-
Vaccinated	4.32 (0.76–109.90)	0.108	4.09 (1.82–9.50)	0.001	3.31 (1.58–7.34)	0.001	2.71 (1.22–6.09)	0.014



Appendix Figure 1. Antibody titers of all tested strains compared by vaccination status and decade of birth. Box and whisker plot of the geometric mean fold change in HI log₂ titer against the swine strain compared to each respective participant's HuVac HI titer within each cohort. Antigens are organized by H1 1A, H1 1B, and H3. Orange box plots represent unvaccinated individuals, and blue represents vaccinated individuals. Human seasonal vaccine strain boxplots are outlined in gray in the lefthand column.



Appendix Figure 2. Heat map of percentage of hemagglutinin and neuraminidase combinations between July 2021 and June 2022.



Appendix Figure 3. Reproduction number modeling with serologic data for all participating individuals. (A) Proportion of immune participants (B) Relative reduction in R_0 . Error bars represent 95% confidence intervals. Strains are ordered by increasing minimum R_0 thresholds.