

Trends in SARS-CoV-2 Infection and Vaccine Antibody Prevalence in a Multi-Ethnic Inner-City Antenatal Population: a Cohort Study

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Abstract

Objective: To determine SARS-CoV-2 seroprevalence in a UK pregnancy cohort and assess associations with demographic factors and vaccination timing. **Design:** Observational cohort study. **Setting:** UK inner-city maternity centre. **Sample:** 960 pregnant women attending nuchal scans from July 2020-January 2022. **Methods:** Blood samples were tested for IgG antibodies against SARS-CoV-2 nucleocapsid (N) and spike (S) proteins. Self-reported demographics, vaccination status and previous Covid-19 infection were extracted from health records. Multivariable regression models determined factors associated with seroprevalence and antibody titers. **Main outcome measures:** IgG N- and S-protein antibody titers. **Results:** 196/960 (20.4%) women were SARS-CoV-2 seropositive from previous infection. Of these, 70 (35.7%) self-reported previous infection. Amongst unvaccinated women, black women were most likely to be SARS-CoV-2 seropositive (aRR 1.88 [95% CI, 1.35-2.61], $P < 0.001$). Women from black and mixed ethnic backgrounds were least likely to have a history of vaccination with seropositivity to S-protein (aRR 0.58 [95% CI, 0.40-0.84], $P = 0.004$ and aRR 0.56 [95% CI, 0.34-0.92], $P = 0.021$ respectively). Double vaccinated, previously infected women had higher IgG S-protein antibody titers than unvaccinated, previously infected women (mean difference: 4.76, 95% CI = [2.65, 6.86], $P < 0.001$). Vaccination timing before vs during pregnancy did not significantly affect IgG S antibody titers ($F(1, 77) = [0.07]$, $P = 0.785$). **Conclusions:** This inner-city pregnancy cohort demonstrates high rates of asymptomatic SARS-CoV-2 infection with women of black ethnicity having higher infection risk and lower vaccine uptake. SARS-CoV-2 antibody titers were highest among double vaccinated, previously infected women.

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