

## Evidence for and level of herd immunity against SARS-CoV-2 infection: the ten-community study

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### Abstract

**Background** Qatar experienced a large severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic that disproportionately affected the craft and manual workers (CMWs) who constitute 60% of the population. This study aimed to investigate level of immunity in communities within this population as well as infection exposure required to achieve herd immunity.

**Methods** Anti-SARS-CoV-2 seropositivity was assessed in ten CMW communities between June 21 and September 9, 2020. PCR positivity, infection positivity (antibody and/or PCR positive), and infection severity rate were also estimated. Associations with anti-SARS-CoV-2 positivity were investigated using regression analyses.

**Results** Study included 4,970 CMWs who were mostly men (95.0%) and <40 years of age (71.5%). Seropositivity ranged from 54.9% (95% CI: 50.2-59.4%) to 83.8% (95% CI: 79.1-87.7%) in the different CMW communities. Pooled mean seropositivity across all communities was 66.1% (95% CI: 61.5-70.6%). PCR positivity ranged from 0.0% to 10.5% (95% CI: 7.4-14.8%) in the different CMW communities. Pooled mean PCR positivity was 3.9% (95% CI: 1.6-6.9%). Median cycle threshold (Ct) value was 34.0 (range: 15.8-37.4)—majority (79.5%) of PCR-positive individuals had Ct value >30 indicative of earlier rather than recent infection. Infection positivity (antibody and/or PCR positive) ranged from 62.5% (95% CI: 58.3-66.7%) to 83.8% (95% CI: 79.1-87.7%) in the different CMW communities. Pooled mean infection positivity was 69.5% (95% CI: 62.8-75.9%). Only five infections were ever severe and one was ever critical—an infection severity rate of 0.2% (95% CI: 0.1-0.4%).

**Conclusions** Based on an extended range of epidemiological measures, active infection is rare in these communities with limited if any sustainable infection transmission for clusters to occur. At least some CMW communities in Qatar have reached or nearly reached herd immunity for SARS-CoV-2 infection at a proportion of ever infection of 65-70%.

### Biography:

Andrew Jeremijenko did his medical education in Queensland. He is a specialist in Occupational and Environmental Medicine. He has worked in Australia, Asia and the Middle East. He is

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