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M.G. has received sponsored research agreement funding from Astarte Medical Partners and Takeda Pharmaceutical Company Limited. She also participated in a neonatal microbiome advisory board for Abbott Laboratories. None of these sources had any role in this study. The remaining authors report no conflict of interest.

This publication in part was supported by a grant to E.B.C. by the Foundation for Barnes-Jewish Hospital and their generous donors; and the Institute of Clinical and Translational Sciences, Washington University in St. Louis, which is, in part, supported by the Clinical and Translational Science Award under grant number UL1TR002345 from the National Institutes of Health (NIH)/National Center for Advancing Translational Sciences. J.C.K. was supported by grant number 00033770 from the PEW Charitable Trusts Community Opioid Response and Evaluation (CORE). L.S.N. was supported by grant number 5T32HD043010 from the NIH and an American Academy of Pediatrics Marshall Klaus Award. M.G. was supported by grant number R01DK118568 from the NIH, the St. Louis Children's Hospital Foundation, the Children's Discovery Institute of Washington University and St. Louis Children's Hospital, and the Department of Pediatrics at Washington University School of Medicine in St. Louis.

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Severe acute respiratory syndrome coronavirus 2 immunity: infective and naive incidence in fertility clinics after lockdown

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OBJECTIVE: The outbreak and second wave of the coronavirus disease 2019 (COVID-19) pandemic pose a concern to the public, including couples wishing to conceive and pregnant women.[1] During the pandemic, many fertility clinics suspended treatment. When reopening was undertaken, routine triage, social distancing, and masks were necessary. However, this may be insufficient, because there is a 5-day asymptomatic window until infection becomes evident and 30% of infected people are asymptomatic.[2] This study aimed to report the incidence of immune, infected, and naive status for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among asymptomatic clinical staff and patients in 2 fertility centers located in Massachusetts and Utah, states with different COVID-19 prevalence rates.

STUDY DESIGN: This prospective study enrolled 339 asymptomatic individuals, from June 18 to July 30, 2020. After a routine symptom-based screening, exclusively asymptomatic individuals attending or working in the 2 clinics were tested by reverse transcription polymerase chain reaction (RT-PCR) on nasopharyngeal swab for SARS-CoV-2 RNA detection (Thermo Fisher Scientific, Waltham, MA) and for immunoglobulin G (IgG) detection on blood samples (Abbott, Scarborough, ME), following the Food and Drug Administration Emergency Use Authorization protocols. In clinic A (Utah Fertility Center) located in a low-prevalence state (312 cases per 100,000 during the study), 154 individuals were analyzed, whereas in clinic B (Boston IVF) (1462 cases per 100,000 during the study), 185 individuals were tested. The study was approved by an independent review board and registered in ClinicalTrials.gov (ID NCT 04466644). All results were reported to the applicable health authority.

RESULTS: From the 339 asymptomatic individuals, the percentage of informativity was 100% for RT-PCR and 99.4%

TABLE
Incidence of immune, infected, and naive individuals for coronavirus disease 2019 in clinics A and B

	Clinic A Utah Fertility Center, % (n/N)	Clinic B Boston IVF Center, % (n/N)	*P* value
Immune	0.65	2.20	.46
RT-PCR (−)/IgG (+)	(1/154)	(4/183)	
Infected	0.65	0.50	1
RT-PCR (+)	(1/154)	(1/183)	
Naive	98.70	97.30	.46
RT-PCR (−)/IgG (−)	(152/154)	(179/183)	

Chi-square test was used to compare the study groups and *P* values below .05 should be considered statistically significant.

IgG, immunoglobulin G; *RT-PCR*, reverse transcription polymerase chain reaction.

Foulk. Testing for severe acute respiratory syndrome coronavirus 2 in fertility clinics. Am J Obstet Gynecol 2021.

(337 of 339) for the IgG test. In a total of 337 individuals with informative results for both tests, SARS-CoV-2 presence was detected in 2 of 337 (0.59%), and 5 of 337 (1.48%) had a positive result for IgG serology. In clinic A, we found 0.65% of infected (1 of 154), 0.65% of immune (1 of 154), and 98.7% of still naive individuals (152 of 154) for this virus, whereas in clinic B we showed similar findings, being 0.5% of infected (1 of 183), 2.2% of immune (4 of 183), and 97.3% of naive (178 of 183) (Table). Individuals with a positive result for the RT-PCR analysis were quarantined in accordance with the Centers for Disease Control and Prevention guidelines.[3] Remarkably, RT-PCR−positive individuals were also IgG positive, suggesting virus persistence or reinfection with a high risk of viral transmission that, if tested by serology alone, would be considered immune.

CONCLUSION: Asymptomatic transmission is the Achilles' heel of current strategies to control COVID-19.[4] Our study provides an omnibus description of the scenario inside fertility centers at the time of resumption of treatment. SARS-CoV-2 presence was detected in 0.6% of the population tested, whereas 98.62% were still naive for this virus. Taking into account the rapid spread of SARS-CoV-2, with 2 to 3 people infected from every index case,[5] transmission remains a risk in the studied population. In addition, the impact of the pandemic is far from reaching the level required to achieve herd immunity. In addition to routine protective measures, these results draw attention for the possible implementation of testing for SARS-CoV-2 in reproductive clinics as a means of preventing reemerging outbreaks. ■

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This study has been funded by Igenomix USA LLC, which is the promoter of the study.

The findings in this paper were presented as poster at the "Virtual Congress ASRM 2020," October 21, 2020.

ClinicalTrials.gov (ID NCT 04466644); http://www.clinicaltrials.gov.

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