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# Community COVID-19 Incidence and Health Care Personnel COVID-19 Seroprevalence

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Health care personnel (HCP) have absorbed substantial risks of acquiring coronavirus disease 2019 (COVID-19) due to their care of patients with COVID-19 infection throughout the pandemic. Nevertheless, because of robust health care infection prevention and control practices and policies that prevent patient-to-HCP transmission, it is possible that the greatest risk of COVID-19 transmission to HCP comes from exposure in their communities and, secondarily, between essential workers. Early in the pandemic, several studies demonstrated increased COVID-19 seroprevalence among HCP, but these studies did not account for the risk associated with community exposure among these essential workers.<sup>1</sup> Jacobs et al<sup>2</sup> add to the growing body of evidence that hospital infection prevention policies and personal protective equipment (PPE) can reliably protect against COVID-19. Their study evaluated COVID-19 seroprevalence in 24 749 HCP practicing in 4 health systems in 3 distinct geographic regions at various stages of the pandemic surge. HCP seroprevalence was significantly associated with the incidence of COVID-19 in the communities where HCP lived and exposure to a community contact with COVID-19 but not to numerous workplace factors, including job role, hospital work location, or care of patients with COVID-19.

These findings make sound epidemiologic sense. Coronaviruses are known to spread in communities via everyday activities, which pose risks of exposure through close contact with respiratory droplets through air or fomites. This would include shared contact while running errands, eating out, going to work, or meeting with friends and family. Adherence to community-level control measures is difficult at best to enforce, let alone monitor, resulting in community-level susceptibility to the uncontrolled actions and behavior of others.

Despite the close contact activity that HCP regularly participate in, such as obtaining medical histories, conducting physical examinations, and performing procedures—including aerosol-generating procedures with the highest risk of transmission—these activities occur within health care systems with infection prevention practices designed to protect individuals from communicable diseases. In addition, the nature of patient-based vs community-based contact is markedly different. HCP are well trained for health care interactions, and adherence to infection prevention strategies is actively monitored in a manner that is not available in community settings. Patient-based contact is professional, with HCP protected by layered infection prevention strategies that begin with symptom screening on arrival, vital sign checks, and hand hygiene before entering the room. It includes PPE requirements as well as scheduled and standardized environmental cleaning. HCP interactions with patients are generally brief and episodic compared with interactions with family or close friends, where masking and distancing are often not practiced. In fact, the close, personal, and sustained contact among household members, family, and close friends would commonly pose a high risk of transmission for COVID-19.

The finding by Jacobs et al<sup>2</sup> that HCP infection rates are strongly associated with residential incidence further suggests that elements of housing and community are linked to transmission. While their study did not evaluate characteristics of zip code residence other than incidence of COVID-19, it is likely that other socioeconomic factors, such as housing instability, density, and crowding in the form of large or multigenerational households or apartment buildings, further compound the risks of community-level transmission.<sup>3,4</sup> Use of public transportation; congestion in crowded public

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settings, such as the grocery store; or the need to access the internet and other information sources in public spaces further increase the risk of exposure.<sup>3</sup>

The study's findings have several important implications for current and future pandemic response and priorities. First, the findings reinforce long-standing concepts in infection prevention regarding contagiousness and effective strategies for limiting spread. They highlight the importance of decades of investment in protocols for hand hygiene, PPE use, and environmental cleaning practices that are entrained in hospital culture, emphasized by national patient safety metrics, and overseen by regulatory agencies, such as the Joint Commission. Thus, addressing national supply and PPE shortages to ensure adherence to infection prevention protocols in medical settings (eg, alcohol hand rub, disinfectant wipes, medical masks, face shields, gowns, gloves) is paramount to ensuring safe care of patients with COVID-19. Furthermore, the shortages created by supply and demand necessitates that only essential infection prevention protocols are adopted and promulgated in national guidance.

Second, the finding that workplace factors were not associated with COVID-19 infection while community incidence of COVID-19 was highlights the need to invest in the communities that hospitals serve and HCP live in. Pandemic response efforts should invest heavily in community outreach in high-risk areas to mitigate spread, with attentiveness to culturally and language-appropriate education, distribution of masks and hand hygiene products, early testing and quarantining, and timely treatment. Hospitals and academic institutions with expertise in infection prevention practices and community-based interventions should actively seek partnerships with local public health departments to ensure that non-hospital-based health care (eg, nursing homes) and community group settings (eg, schools, businesses, group homes, prisons) receive education and marketing efforts to encourage infection prevention strategies and have ample PPE to adequately mitigate transmission.

The generalizability of the findings in the study by Jacobs et al<sup>2</sup> may be limited to large health systems and particularly academic centers that have experience designing complex protocols to address patients with highly complex disease. Large academic hospitals often have more robust infection prevention programs capable of meeting challenges that other settings, like nursing homes or small community hospitals, may not have, such as access to sufficient infection prevention staff and expertise, ability to secure adequate PPE, reliable monitoring to ensure protocol adherence, and resources to ensure education and training on infection prevention practices. Academic facilities also have a long-standing culture of learning and teaching, so feedback and expectations for protocol adherence are high. Another limitation of this study is that all those studied were essential HCP within a hospital without comparison with the COVID-19 infection risk of other essential workers in the community (eg, food service or housing workers) or nonessential workers who could work from home.

This study represents one of the largest assessments of COVID-19 seroprevalence among HCP in the United States, and its findings highlight the protective effects of PPE and protocols in the hospital setting. These findings help correct misperceptions that HCP remain at higher risk of communicable disease despite adequate PPE and infection prevention protocols. In the early phases of the pandemic, infection prevention programs across the nation spent significant time and effort to address HCP fears and provide education and reassurance related to PPE effectiveness. More data are needed on how to optimize HCP adherence to infection prevention protocols, including speaking up about symptoms and avoiding working while ill. Finally, the reassurance that infection prevention protocols and PPE are effective should not undermine the front-line contribution of HCP who are appropriately prioritized for PPE and COVID-19 vaccination given their critical role in pandemic response.

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