

**STATE OF THE ART AND SCIENCE**

**Investigating How Geography, Citizenship, and Insurance Influence HPV Vaccination**

Sienna Moriarty

**Abstract**

Research on the human papillomavirus (HPV) suggests a possible relation between HPV type and geography. It also demonstrates that insurance status affects HPV vaccine uptake, which currently provides protection against 9 of the high-risk HPV types known to cause HPV-related cancers. This article reviews this literature with a focus on health justice in HPV vaccination programs. It also describes University of Illinois Health System research with members of Chicago communities to determine the prevalence of HPV, the distribution of HPV types, and strategies for better serving this population.

**Possible Influence of Geography on HPV Genotype**

Several studies have noted a high frequency of atypical high-risk HPV genotypes. Researchers in Michoacán, Mexico, noticed that there was a high frequency of “unusual virus genotypes” when they introduced a different type of testing into their methodology.<sup>1</sup> Specifically, it was found that HPV59 was most prevalent, along with other types (51, 45, 31, 58, 35, 39, 52, and 67) and “that HPV16 was only found in 3 coinfections and HPV18 was not found at all.” Similarly, high rates of other high-risk HPV (ohrHPV) genotypes were found in patients in the Montefiore Medical Center, the Bronx, New York, which serves a racially diverse population.<sup>2</sup> Another study on the Midwestern population serviced by the Mayo Clinic in Rochester, Minnesota, also reported ohrHPV genotypes in its dominant diagnoses.<sup>3</sup>

The Michoacán and Montefiore studies suggest that there might be a relation between geography and HPV genotype. If the frequency of “unusual virus genotypes” in the Michoacán study is related to ethnicity, it might help to account for the high frequency of ohrHPV genotypes in the Montefiore sample, which was 52% Hispanic and “other,”<sup>2</sup> as high numbers of migrants from Michoacán and other nearby Mexican states have come to the United States in the last 30 years.<sup>4,5</sup>

The findings also have implications for vaccination programs. The unusual or ohrHPV genotypes refer to high-risk HPV types that are not either HPV16 or HPV18, which are the 2 types typically targeted in current research, as they have been identified across the

board in cases of low-grade lesions, high-grade lesions, and cervical cancer.<sup>6</sup> Many genotypes reported by the researchers in Michoacán, however, are not included in the 9 high-risk HPV types known to cause HPV-related cancers that the 9-valent [HPV vaccine](#) protects against.<sup>7</sup> Because researchers in Michoacán found high rates of oncogenic high-risk HPV genotypes that were not HPV16 or HPV18,<sup>2</sup> if there is a relation between ethnicity and HPV type, it follows that quadrivalent or nonvalent vaccines would be less effective when administered to Mexican-American populations than other populations. Further research is needed on geography and HPV genotype and to determine whether changes should be made to current vaccination programs.

### **Access to HPV Preventative Care and Insurance Coverage**

Research has shown that different [racial groups](#) experience the health care system differently with respect to HPV preventative care. For example, a National Vaccine Advisory Committee report showed that Hispanic adolescents are more likely than non-Hispanic white adolescents and non-Hispanic black adolescents to be covered by the latest HPV vaccine.<sup>8</sup> However, the report does not specify what percentage of the Hispanic population surveyed was native born, although a 2009 survey indicates that nearly two-thirds of those who identify as Hispanic are born in the United States.<sup>5</sup> Thus, if the Hispanic sample in the survey was representative, a high proportion of the Hispanic respondents could be expected to be eligible for private or public health insurance coverage. Other research has found that insurance status is associated with HPV vaccination uptake.<sup>9</sup> Citizenship is also relevant to HPV vaccination uptake; one study found that foreign-born women who were US citizens were more likely than noncitizens to report HPV vaccination initiation.<sup>10</sup> However, Mexican-born immigrants—both naturalized and non-naturalized—face lower rates of insurance.<sup>10</sup> In fact, the number of Mexican-born immigrants lacking insurance has nearly doubled in the last 20 years.

### **Current HPV Research**

In Illinois, the population of international migrants from Mexico has nearly doubled in the last 30 years.<sup>4</sup> Most of this population resides in Cook County, totaling between 500 000 and 1 000 000 Mexican-born residents.<sup>11</sup> HPV prevalence among Mexican-born immigrants living in Chicago communities will be investigated by the University of Illinois Health System in collaboration with members of these communities, with special attention to high-risk genotypes among women, barriers to health care access, and prevention through vaccination (R. Barrett, M. Patel, G. Goba, S. Moriarty, unpublished data, 2018). By analyzing HPV genotypes and health assessments<sup>12</sup> in Chicago communities, special attention can be focused on direct benefit to those with HPV.

### **Vaccinations and Health Justice**

Cofie et al. note “there is a need for targeted outreach across various immigrant communities to improve access to health care in general, and to develop population-specific strategies to address the vaccination needs of different groups of foreign-born

women.”<sup>10</sup> Such outreach would entail educating populations about vaccinations and preventive care (ie, HPV testing and condom use). Community-level populations are in need of meaningful study, effective interventions, and positive health outcomes.

## References

1. Jácome-Galarza I, Ito-Nakashimada MA, Figueroa-Aguilar G, et al. Prevalence of human papillomavirus in women from the state of Michoacan, Mexico, showed high frequency of unusual virus genotypes. *Rev Invest Clin*. 2017;69(5):262–269.
2. Ramos Rivera G, Khader SN, Lajara S, et al. The ATHENA HPV study underrepresents “other” high-risk HPV genotypes when compared with a diverse New York City population. *Cytopathology*. 2017;28(5):413–418.
3. Ghosh T, Vandehaar MA, Rivera M, Henry M. High-risk HPV genotype distribution in HPV co-test specimens: a study of a United States midwestern population. *J Am Soc Cytopathol*. 2016;5(5):245–306.
4. Ramírez T, Nava A, Bermúdez Lobera J, et al. Migration and health: Mexican immigrants in the US. Unidad de Política Migratoria, Secretaría de Gobernación/Consejo Nacional de Población. <https://hiau.cb.files.wordpress.com/2014/05/2013-en.pdf>. Published October 2013. Accessed November 26, 2018.
5. Batalova J, Terrazas A. Frequently requested statistics on immigrants and immigration in the United States. Migration Policy Institute. <https://www.migrationpolicy.org/article/frequently-requested-statistics-immigrants-and-immigration-united-states-1>. Published December 9, 2010. Accessed September 4, 2018.
6. Centers for Disease Control and Prevention. 2015 sexually transmitted diseases treatment guidelines. <https://www.cdc.gov/std/tg2015/hpv.htm>. Updated January 25, 2017. Accessed November 27, 2018.
7. Petrosky E, Bocchini JA Jr, Hariri S, et al. Use of 9-valent human papillomavirus (HPV) vaccine: updated HPV vaccination recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2015;64(11):300–304.
8. National Vaccine Advisory Committee. Strengthening the effectiveness of national, state, and local efforts to improve HPV vaccination coverage in the United States: recommendations of the National Vaccine Advisory Committee. <https://www.hhs.gov/sites/default/files/2018-nvachpv-ver15-public-comment.pdf>. Published May 25, 2018. Accessed November 27, 2018.
9. Heintzman J, Hatch B, Coronado G, et al. Role of race/ethnicity, language, and insurance in use of cervical cancer prevention services among low-income Hispanic women, 2009–2013. *Prev Chronic Dis*. 2018;15:e25.
10. Cofie LE, Hirth JM, Guo F, Berenson AB, Markides K, Wong R. HPV vaccination among foreign-born women: examining the National Health Interview Survey. *Am J Prev Med*. 2018;54(1):20–27.

11. Migration Policy Institute. State proportion of the Mexican-born population in the United States [figure].  
[https://www.migrationpolicy.org/sites/default/files/datahub/State\\_Metro\\_ACS\\_2008\\_Mexican.pdf](https://www.migrationpolicy.org/sites/default/files/datahub/State_Metro_ACS_2008_Mexican.pdf). Published 2009. Accessed December 4, 2018.
12. Centers for Disease Control and Prevention. Community health assessment and health improvement planning.  
<https://www.cdc.gov/publichealthgateway/cha/index.html>. Updated August 13, 2018. Accessed January 7, 2019.

**Sienna Moriarty** earned a bachelor of arts degree in sociology from the University of Illinois at Chicago in December 2018. While obtaining her degree, she interned for the American Medical Association (AMA) Ethics Group and the AMA Foundation and explored topics such as migratory patterns, social determinants of health, community health, and LGBTQ health. She is currently interested in intersectionality as it pertains to health and medicine.

#### **Citation**

*AMA J Ethics.* 2019;21(3):E269-272.

#### **DOI**

10.1001/amajethics.2019.269.

#### **Acknowledgements**

This work was supported by Richard Barrett, PhD, emeritus professor of sociology at the University of Illinois at Chicago, and Maya Patel, a medical student at the University of Illinois at Chicago. I would also like to thank Gelila Goba, MD, University of Illinois at Chicago College of Medicine.

#### **Conflict of Interest Disclosure**

The author(s) had no conflicts of interest to disclose.

*The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.*