



Proximity to safety-net clinics and HPV vaccine uptake among low-income, ethnic minority girls

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ABSTRACT

Purpose: Human Papillomavirus (HPV) vaccine uptake remains low. Although publicly funded programs provide free or low cost vaccines to low-income children, barriers aside from cost may prevent disadvantaged girls from getting vaccinated. Prior studies have shown distance to health care as a potential barrier to utilizing pediatric preventive services. This study examines whether HPV vaccines are geographically accessible for low-income girls in Los Angeles County and whether proximity to safety-net clinics is associated with vaccine initiation.

Methods: Interviews were conducted in multiple languages with largely immigrant, low-income mothers of girls ages 9 to 18 via a county health hotline to assess uptake and correlates of uptake. Addresses of respondents and safety-net clinics that provide the HPV vaccine for free or low cost were geo-coded and linked to create measures of geographic proximity. Logistic regression models were estimated for each proximity measure on HPV vaccine initiation while controlling for other factors.

Results: On average, 83% of the 468 girls had at least one clinic within 3-miles of their residence. The average travel time on public transportation to the nearest clinic among all girls was 21 min. Average proximity to clinics differed significantly by race/ethnicity. Latinas had both the shortest travel distances (2.2 miles) and public transportation times (16 min) compared to other racial/ethnic groups. The overall HPV vaccine initiation rate was 25%. Increased proximity to the nearest clinic was not significantly associated with initiation. By contrast, daughter's age and insurance status were significantly associated with increased uptake.

Conclusions: This study is among the first to examine geographic access to HPV vaccines for underserved girls. Although the majority of girls live in close proximity to safety-net vaccination services, rates of initiation were low. Expanding clinic outreach in this urban area is likely more important than increasing geographic access to the vaccine for this population.

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1. Introduction

Low income, ethnic minority, and immigrant women experience a higher burden of cervical cancer in the United States (U.S.) [1,2]. In Los Angeles County (LAC), cervical cancer incidence is significantly higher than the national average (12.1 per 100,000 vs. 8.1

per 100,000) [3], with Latina women having the highest rates (18.1 per 100,000) among all ethnic groups [4].

Wide-spread adoption of HPV vaccines has the potential to substantially reduce future cases of cervical cancer as well as other HPV-related cancers and genital warts [5]. Both the bivalent and quadrivalent vaccines are recommended for routine use among girls ages 11 to 12 years old and approved for use among girls as young as 9 and up to age 26 [6]. Low-income children who qualify for the federally funded Vaccines for Children (VFC) program can access the vaccines for free or low cost via VFC providers [7].

Currently, adolescent HPV vaccination rates remain low in the U.S. Recent national data revealed only 53% of adolescent girls initiated the HPV vaccine and 35% completed the 3-dose series in 2011 [8]. These rates are much lower than uptake rates for other adolescent vaccines [9]. Unless the vaccine is adopted by all

Abbreviations: HPV, human papillomavirus; LAC, Los Angeles County; LACDPH, Los Angeles County Department of Public Health; OWH, Office of Women's Health; VFC, Vaccines for Children.

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subgroups, including girls that are most at risk for cervical cancer, disparities will likely remain. Existing research on HPV vaccine uptake has focused mainly on individual level factors, including demographic characteristics, vaccine knowledge [10,11] and acceptability [12,13]. Recent studies assessing barriers to uptake among disadvantaged groups indicate that less educated, low-income and ethnic minority parents are less likely to have heard of the HPV vaccines or have vaccinated daughters [14,15].

Few studies have explored geographic access to vaccination services, especially among disadvantaged girls, as a potential barrier to HPV vaccine initiation. Geographic access to care, defined as the relationship between the location of health care providers and the location of clients [16], has been shown to impact the utilization of health services, including HIV testing, asthma management, breast cancer screening, and childhood immunizations [17–20]. Importantly, a recent study found that low-income, urban children living closer to pediatricians were more likely to be up to date with childhood vaccinations [17]. In a similar study, asthmatic children with increased geographic access (i.e. proximity) to providers had better longitudinal asthma management [20]. In response to reducing geographic barriers to primary care services, local health departments and individual health care organizations across the country have implemented mobile van clinics as a strategy to increase access to underserved communities [21–23]. A prior study, focused on understanding childhood immunizations in states and urban areas, cited mobile health vans and improving clinic hours as strategies for increasing uptake [24]. Despite the growing evidence that distance to vaccination services may be a plausible barrier to uptake, little is known about whether safety-net immunization services are geographically accessible to disadvantaged communities that can benefit most from HPV vaccines.

This study examines the proximity of county operated and affiliated safety-net immunization clinics to a sample of low-income, ethnic minority girls in Los Angeles County who are age eligible for HPV vaccination. The study also assesses the extent to which HPV vaccine uptake is associated with proximity to safety-net immunization clinics.

2. Methods

2.1. Study population

We used secondary data from a survey of low-income caregivers of adolescent girls. The original study aimed to identify rates of HPV vaccine uptake and correlates of uptake, primarily psychosocial factors, among girls with caregivers who routinely use the LAC safety-net system [25]. This study expands on the original study to examine whether geographic proximity to safety-net clinics is associated with HPV vaccination. Participants were recruited from the Los Angeles County Department of Public Health's (LACDPH) Office of Women's Health's (OWH) telephone hotline. The OWH toll-free hotline provides services, such as scheduling of cervical and breast cancer screening appointments and disseminating health information, to low-income (<200% federal poverty level) and uninsured women. Hotline services are available in multiple languages, including Spanish, Mandarin, Cantonese, Korean, and English. Between January and November 2009, all in-coming callers and prior callers who were called back for other hotline reminder services were introduced to the study and asked to be screened for study eligibility following the completion of normal hotline services.

Eligibility criteria included female callers that were medical decision-makers for at least one HPV vaccine age eligible girl (9–18 years) in the household. We excluded women who were not between the ages of 18 and 65 years old. Callers with more than

one HPV vaccine eligible girl were asked to complete the survey in relation to the girl with the earliest birth month to ensure that surveys were not systematically completed in relation to older or younger girls in the household while at the same time minimizing the burden of the selection process for hotline operators.

Callers of all hotline languages were asked to participate. Among eligible callers, 93% of eligible callers provided informed consent and completed the survey. English speaking participants had slightly lower enrollment rates (81%) compared to Spanish (96%), Korean (97%) and Chinese (98%) speaking callers. Study participants are referred to as “mothers” for simplicity because 85% of women in the study identified themselves as mothers, rather than grandmothers, aunts, or sisters. Mothers were administered a 75-item telephone survey in pencil and paper format that lasted approximately 20–30 min.

2.2. Safety-net clinics

We included all clinics that were part of the Los Angeles County Immunization Program's provider referral list in 2009 ($n = 155$) as likely points of access to free or low cost HPV vaccines for girls in the study sample [26]. These clinics include a combination of county operated health centers or immunization clinics, federally qualified health centers (FQHC) or FQHC look alike clinics, public-private partnership clinics, and other community health or free clinics. All clinics in the LACDPH Immunization Program's provider referral list have the capacity to provide recommended immunizations for children. Many of the clinics provide a full range of primary care services, while others are freestanding immunization clinics operated by the county. All clinics have health care personnel on site to administer vaccines and are enrolled in the VFC program to provide free or low cost vaccines to underserved children in the area. In addition to VFC funding, clinics also receive Title 317 funding to provide vaccines to underinsured populations. Vaccination services are available to low-income girls at these clinics regardless of their insurance status. Because the number of clinics affiliated with the LACDPH Immunization Program can fluctuate over time due to clinic closures and expansions, we used the clinic list available in 2009 to match the data collection period of our study. Women who call the OWH telephone hotline routinely ask for referrals to women's health services via safety-net clinics within the county and routinely use safety-net services. The clinics included in this study are the same clinics that mothers would be referred to by the LACDPH to access free or low cost vaccinations for their daughters. Geographic proximity to these clinics, therefore, encompasses the majority of VFC providers within the county system that provide safety-net vaccination services.

3. Measures

3.1. Primary predictor: geographic access

Geographic access was defined as spatial and temporal proximity to clinics. We explored the following measures to characterize geographic proximity: 1.) shortest straight-line (Euclidean) distance, 2.) shortest travel distance over a road network, 3.) availability of at least one clinic within a 3-mile radius of residence, 4.) shortest driving time, 5.) shortest public transportation time. Locations of residences for each vaccine eligible girl and safety-net clinics were geo-coded using ArcGIS 10 (ESRI, Redlands, CA). We excluded 11 participants with addresses that could not be geocoded accurately beyond the zip code level.

Straight-line distance was measured as the shortest direct distance (miles) between each respondent's residence and the nearest clinic. While straight-line distance is often used in the literature, it

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