

Electronic Health Records in Community Health Centers: A tool for cervical cancer preventive service surveillance among the uninsured



1 Background

- Community health centers' (CHCs) adoption of electronic health records (EHRs) offers new opportunities to understand preventive services utilization in underinsured populations typically 'invisible' in claims-based surveillance.
- Understanding the factors that influence service utilization could help to improve preventive services delivery in CHCs.
- We leveraged a unique EHR database to evaluate associations between insurance continuity and utilization of cervical cancer preventive services in a CHC population.

2 Methods

- Study design:** The study involved secondary analysis of EHR data from 30 clinics in 2 states. Data were supplied by OCHIN, a non-profit organization that provides EHRs to CHCs across the US.
- Analytic strategy:** A series of bi-level logistic regression models were used to estimate adjusted odds ratios (AORs) and 95% confidence intervals (CIs) for receipt of cervical cancer preventive services by insurance continuity.

Patient-level factors were modeled as fixed effects at level 1. The patient's home clinic was included as a random intercept at level 2 to account for nesting of patients within clinics.

- Study population and outcomes:** Two outcomes were examined, each in a separate population:
 - Receipt of ≥ 1 routine Pap test in 2008-2010 in established female patients aged 21-64 who accessed care in 2010 (n=11,951).
 - Receipt of ≥ 1 dose of human papillomavirus (HPV) vaccine in 2008-2010 in female patients age 9-26 who accessed care in 2008-2010 (n=18,311).

- Primary predictor:** Insurance continuity, as percentage of time in 2008-2010:
 - Continuously insured = covered 100% of the time
 - Partially insured = covered 1-99% of the study period
 - Uninsured = No coverage during the study period

- Co-variables:** Age, race/ethnicity, and household income as a percent of federal poverty level (FPL).

Patients with documented reasons to forgo Pap screening or HPV vaccination were excluded. Patients who were pregnant during 2008-2010 were excluded from the Pap analysis. Pap tests ordered for non-screening reasons (i.e. diagnosis) were excluded from the Pap analysis.

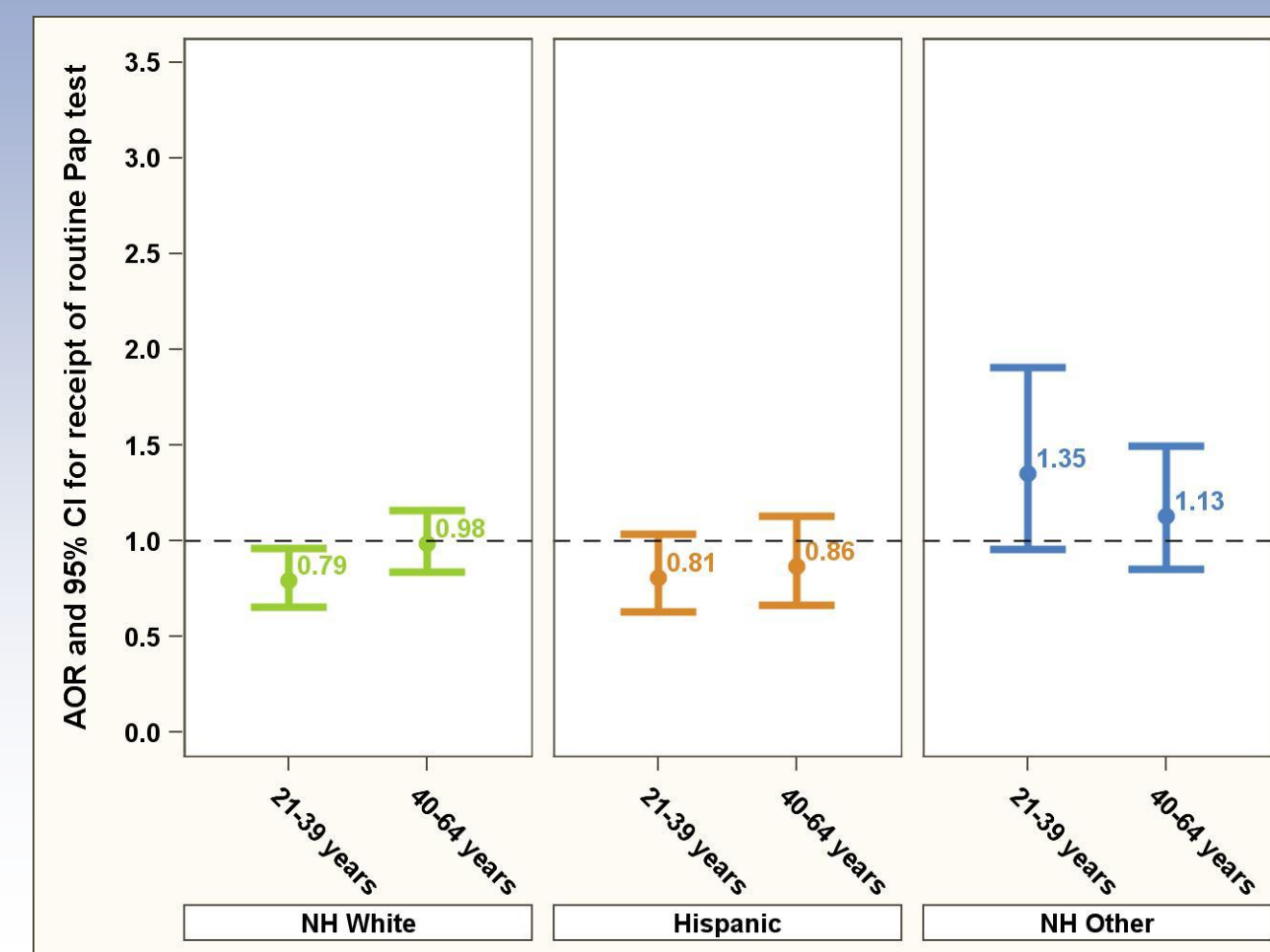
3a Results – Pap tests

- After adjusting for race/ethnicity, age and FPL, insurance continuity affected the odds of receiving a routine Pap test, but the magnitude and direction of the effect differed by race/ethnicity and age.

Compared to the continuously insured, female patients with partial insurance were...

- generally as likely to receive a routine Pap test (Figure 1a).
- the only exception was among whites age 21-39, who were significantly less likely to receive a routine Pap test.

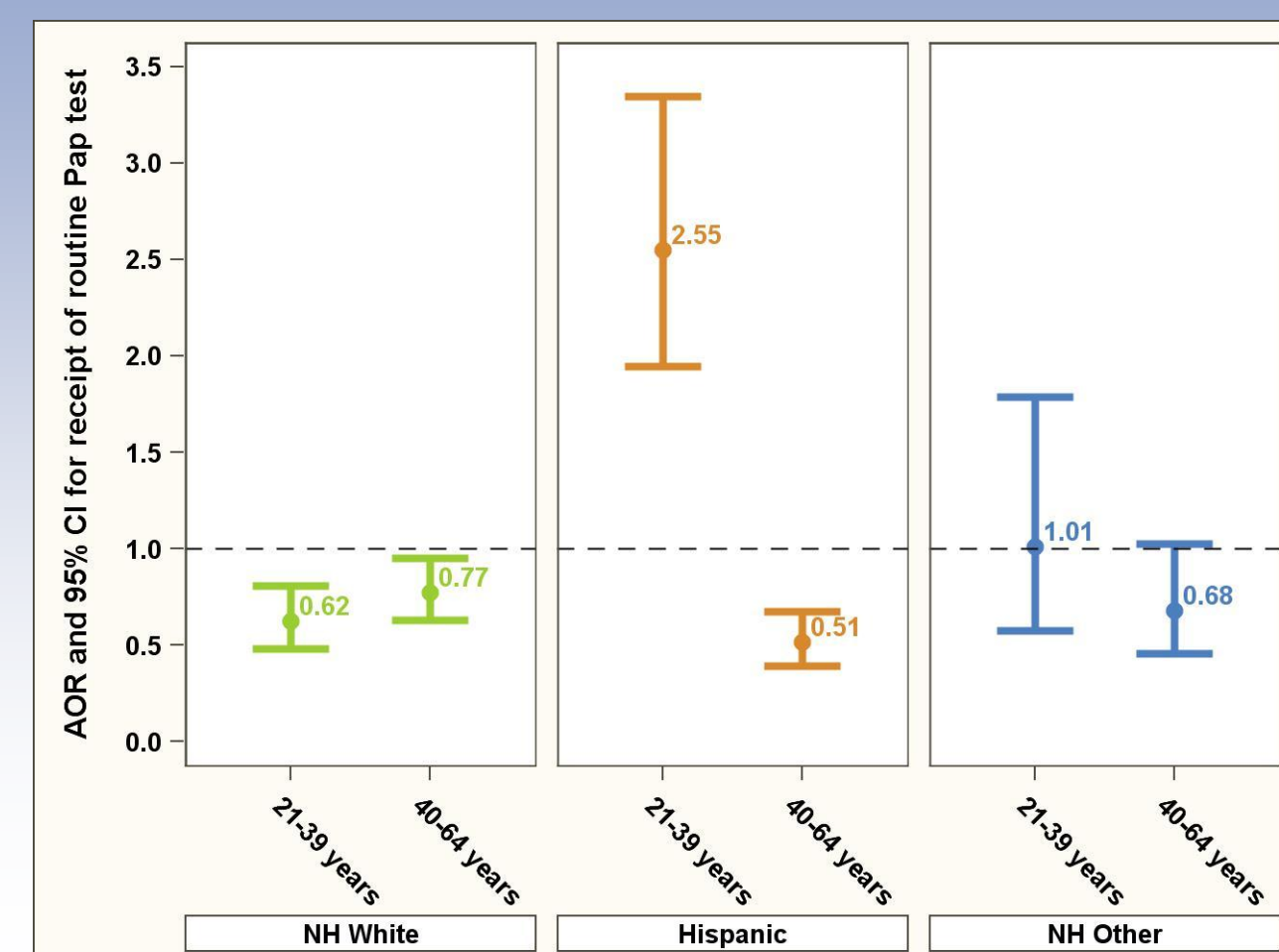
Figure 1a Adjusted odds ratios for receipt of routine Pap test among the partially insured (n=3,856) compared to continuously insured (n=5,062) by race/ethnicity and age



Compared to the continuously insured, female patients with no insurance were...

- significantly more likely to receive a routine Pap test if they were Hispanic and age 21-39 (Figure 1b).
- significantly less likely to receive a routine Pap test if they were Hispanic and age 40-64, or if they were white.

Figure 1b Adjusted odds ratios for receipt of Pap test among the uninsured (n=2,642) compared to continuously insured (n=5,062) by race/ethnicity and age



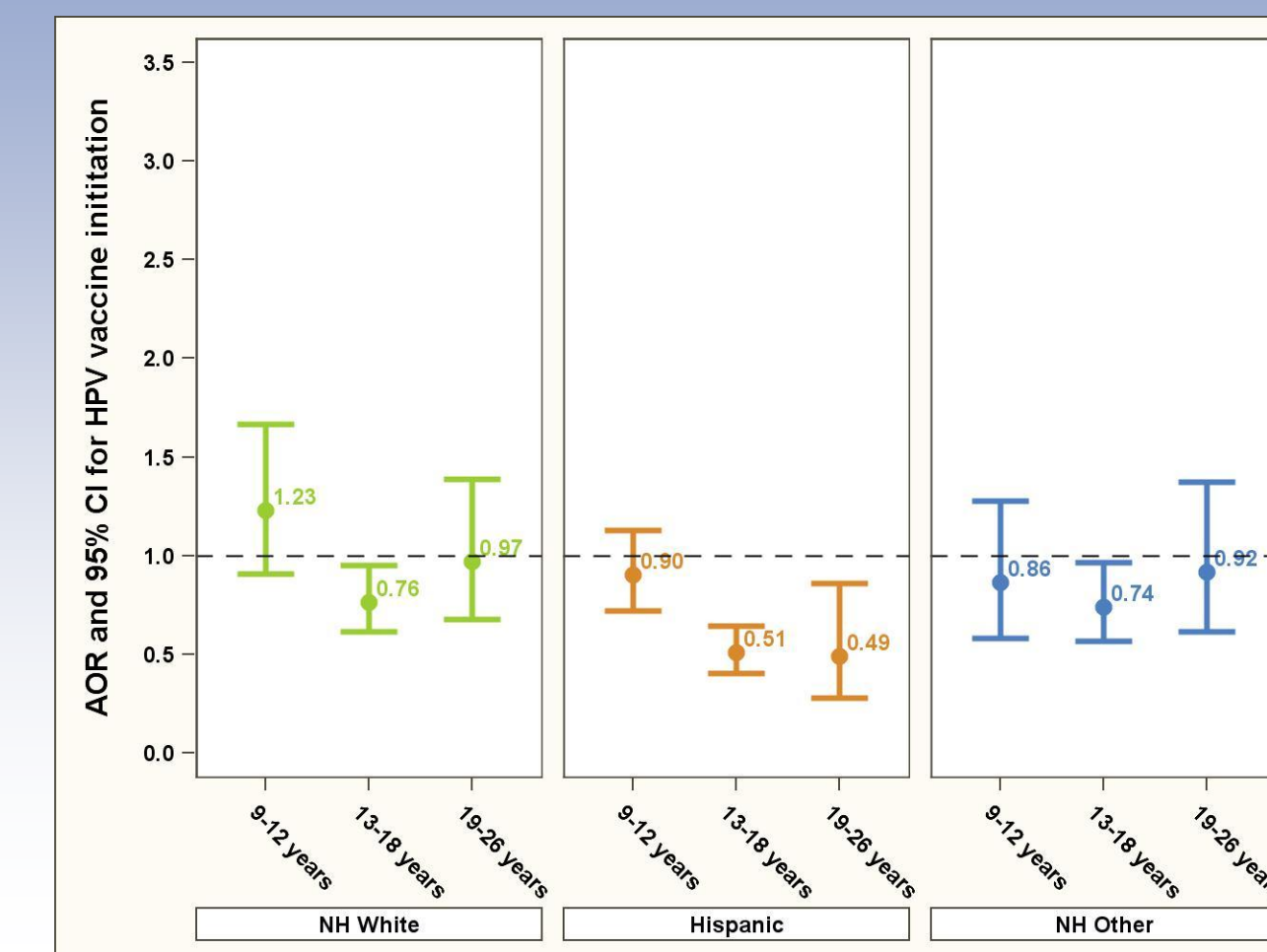
3b Results – HPV vaccination

- After adjustment, insurance continuity was also a significant predictor of HPV vaccine series initiation, but the effect again varied by race/ethnicity and age.

Compared to the continuously insured, female patients with partial insurance were...

- significantly less likely to initiate the HPV vaccine series if they were age 13-18 (Figure 2a).
- also significantly less likely to initiate the vaccine series if they were Hispanic and age 19-26.

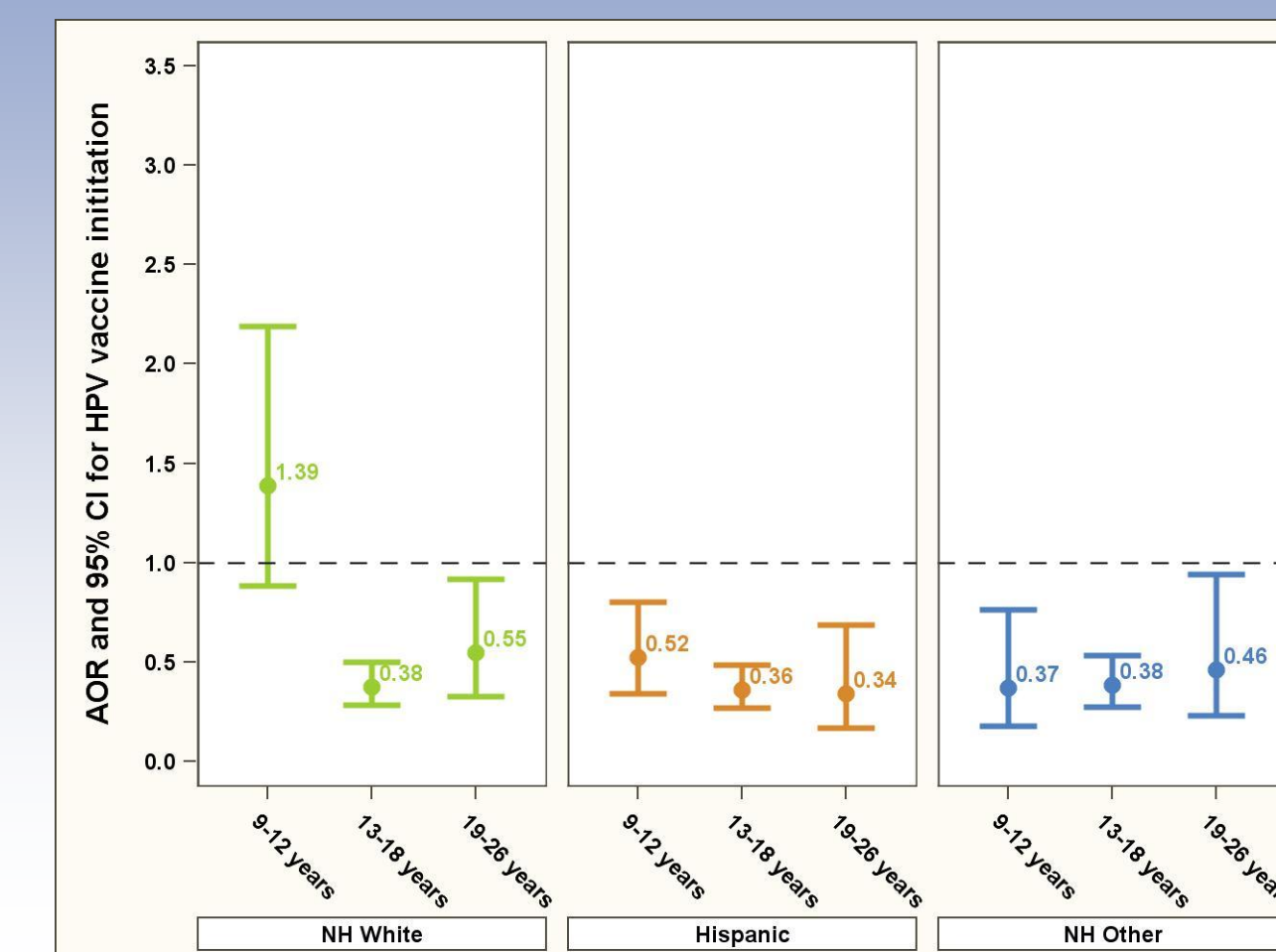
Figure 2a Adjusted odds ratios for initiation of HPV vaccine series among the partially insured (n=11,092) compared to continuously insured (n=3,643) by race/ethnicity and age



Compared to the continuously insured, female patients with no insurance were...

- in general, significantly less likely to initiate the HPV vaccine series (Figure 2b).
- the only exception was among whites age 9-12 years, where lack of insurance was not associated with vaccine initiation.

Figure 2b Adjusted odds ratios for initiation of HPV vaccine series among the uninsured (n=3,576) compared to continuously insured (n=3,643) by race/ethnicity and age



4 Discussion

- Our study describes the association between insurance continuity and receipt of cervical cancer preventive services in female patients who accessed care in a network of safety-net clinics between 2008 and 2010.
- To our knowledge, this is one of only a few large-scale studies investigating preventive service utilization in CHCs based exclusively on EHR data.
- The study highlights how EHRs enable surveillance among the uninsured and underinsured without resorting to cost- and time-intensive chart reviews or patient surveys. This study included over 6,000 patients who had no health insurance during 2008-2010 and almost 15,000 patients who were sporadically insured during that time.
- In our study population, being uninsured or partially insured lowered the odds of Pap screening more for whites than for non-whites. These results suggest that the CHCs in our study might have Pap screening programs that are effective at reaching underinsured minorities, particularly younger Latinas.
- Being uninsured also lowered the odds for HPV vaccination in the majority of our study population. Opportunities for increasing HPV vaccine uptake among the uninsured may exist through promotion of the federal Vaccines for Children program, which provides free vaccines to uninsured patients <19 years of age.
- Our results illustrate that while CHCs continue to provide important preventive services to vulnerable patients regardless of their ability to pay, having continuous insurance makes a difference for this population. Our findings may also contribute to the debate on health care reform, by providing insight into the impact of insurance on preventive service receipt.

5 Limitations

- This is a cross-sectional study. A causal relationship between insurance continuity and receipt of cervical cancer preventive services cannot be inferred based on the data presented.
- Our data are limited to a largely underserved and vulnerable population of patients seen in OCHIN-affiliated CHCs, and may not be generalizable to the broader population.
- Patients may have received cervical cancer preventive services at locations outside the participating CHCs, thus Pap screening and HPV vaccination prevalence may be underestimated.

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