



Impact of the US HPV vaccination program on HPV-associated outcomes

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Monitoring Impact of HPV Vaccination

- HPV prevalence in several populations
 - National Health and Nutrition Examination Survey (NHANES), women undergoing cervical cancer screening, men who have sex with men
- Anogenital warts
 - Claims data
- Juvenile onset recurrent respiratory papillomatosis (JORRP)
 - Network of pediatric otolaryngologists
- Cervical precancers
 - Population-based surveillance and administrative data, state-based data
- HPV-associated cancers
 - State-based cancer registries

Monitoring Impact of HPV Vaccination

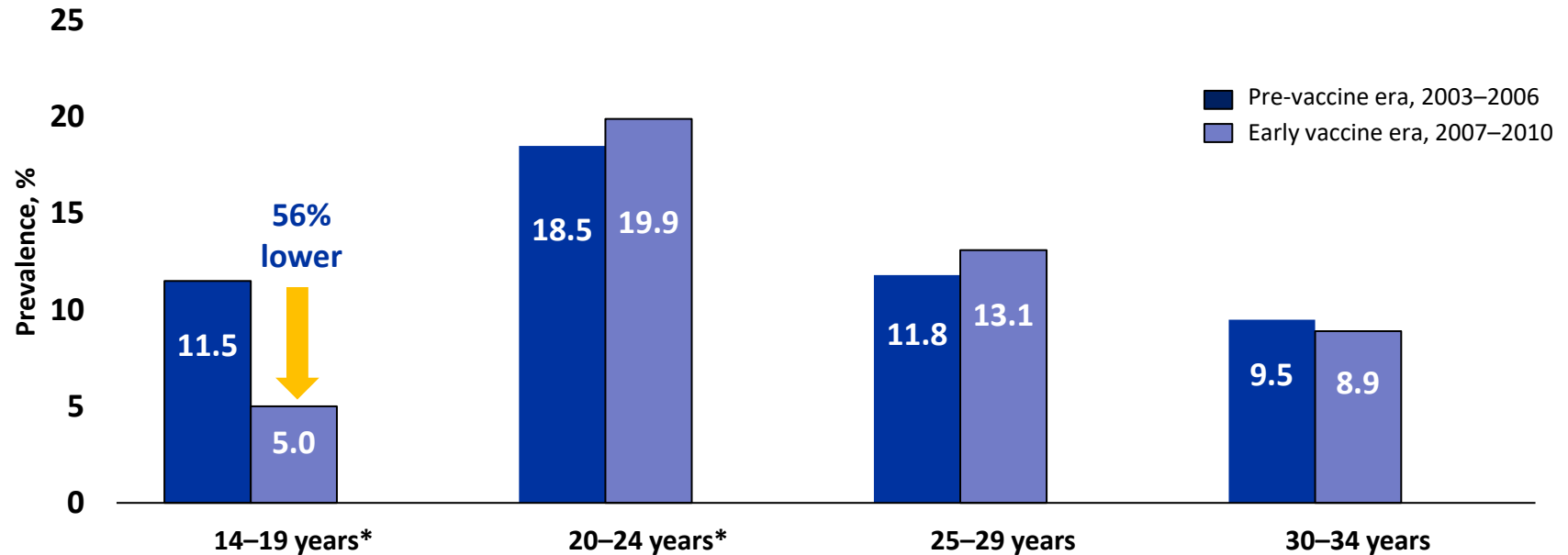
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HPV Prevalence Monitoring in Genital Specimens: National Health and Nutrition Examination Survey (NHANES)

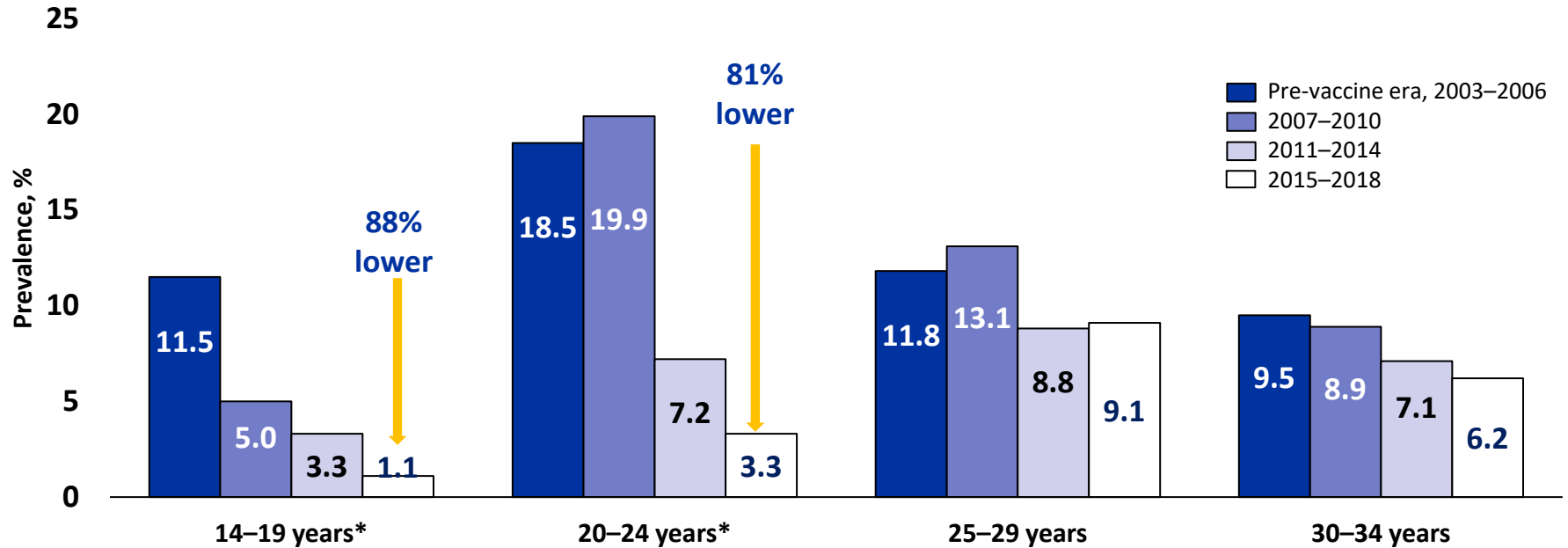
- **HPV DNA testing**
 - Self-collected vaginal swabs ongoing since 2003
 - Self-collected genital swabs in males since 2013
 - Linked to demographic, limited behavioral data, self/parent-reported HPV vaccination history



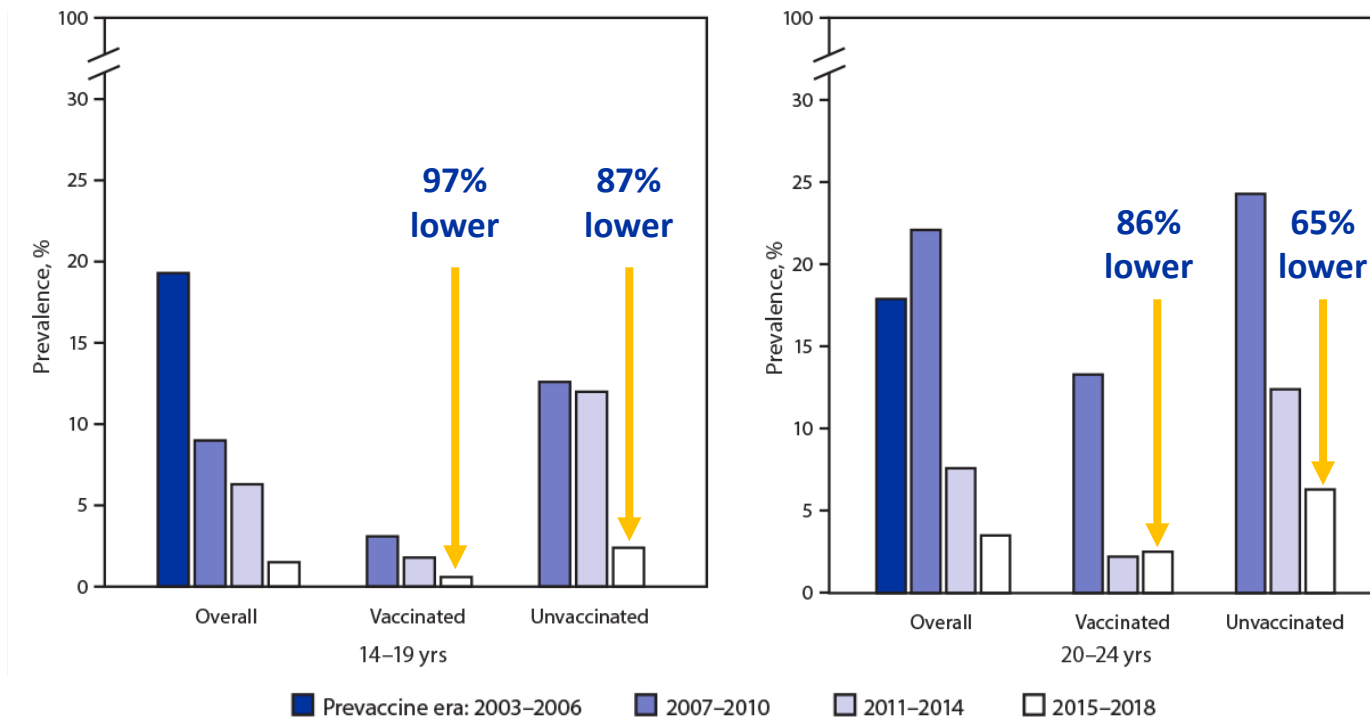
Prevalence of Vaccine-type HPV (HPV 6,11,16,18) in Females, 2007–2010 Compared to Pre-vaccine Era



Prevalence of Vaccine-type HPV (HPV 6,11,16,18) in Females, 2015–2018 Compared to Pre-vaccine Era



Vaccine Impact among Vaccinated* and Unvaccinated Sexually Experienced Females

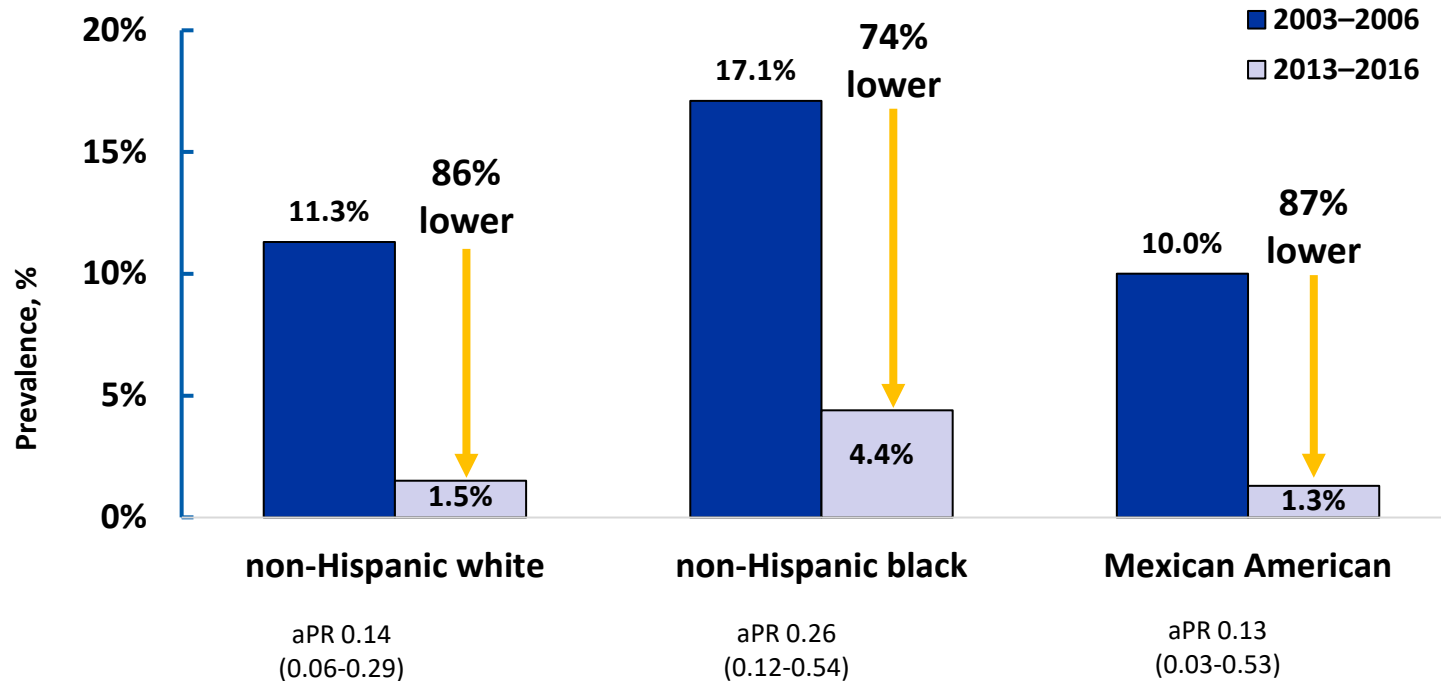


* Reported receipt of ≥ 1 HPV vaccine dose.

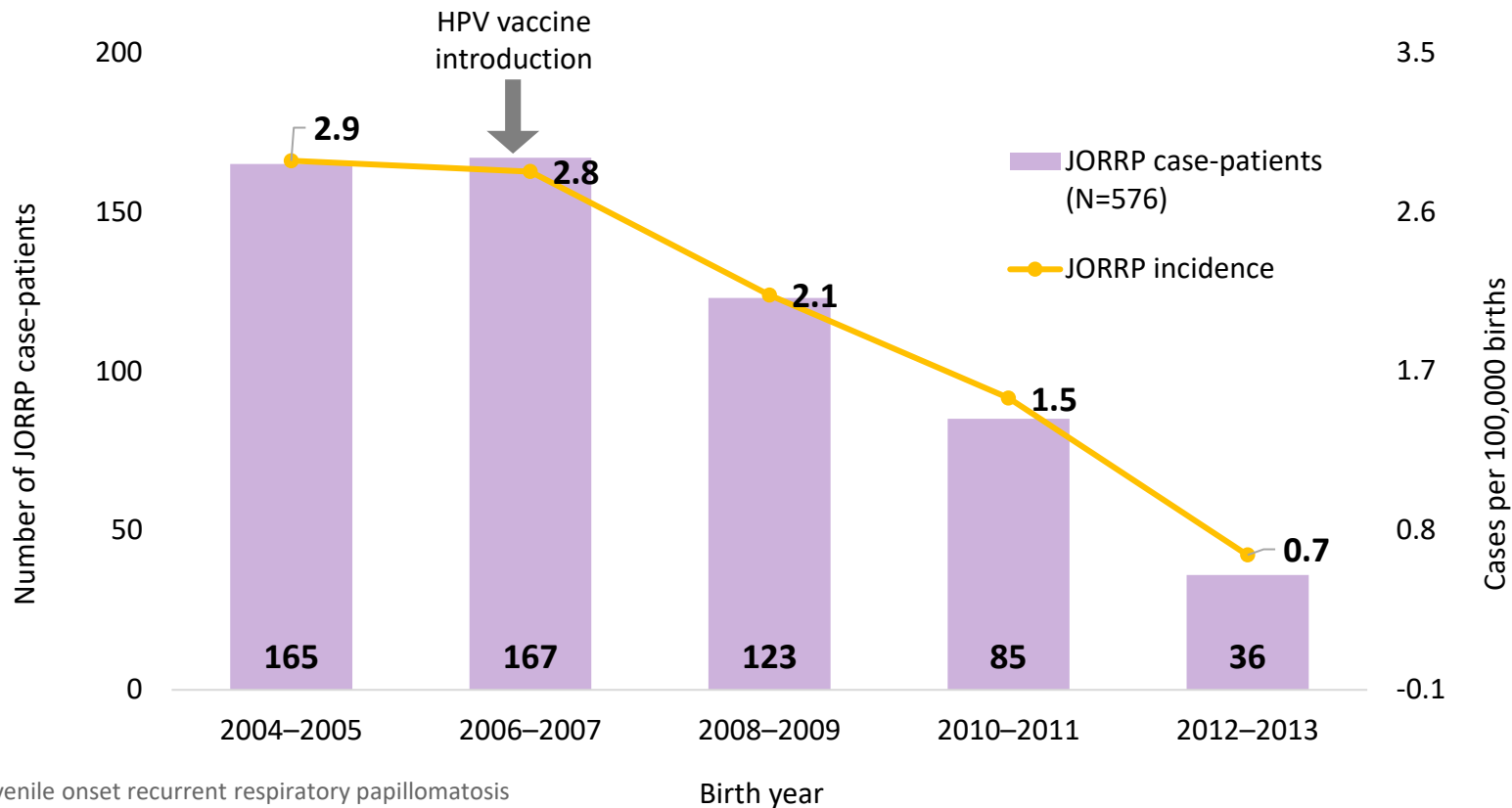
Rosenblum et al. *MMWR* 2022

NHANES: National Health and Nutritional Examination Survey

Prevalence of Vaccine-type HPV (HPV 6,11,16,18) in 14–19 Year-old Females, 2013–2016 Compared to Pre-vaccine Era, by Race/Ethnicity



JORRP Case-Patients and Incidence by Birth Year



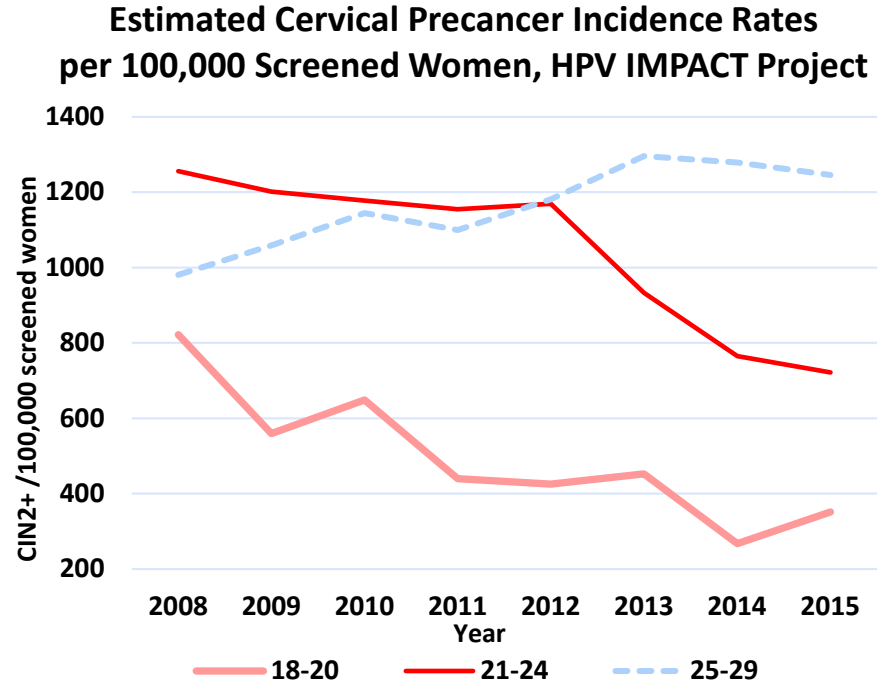
Evaluation of HPV Vaccine Impact on Cervical Precancers in the United States

- Population-based surveillance in locations in 5 states (HPV-IMPACT)
- Administrative claims data in privately insured women
- CIN3 surveillance through cancer registries
- Monitoring challenging due to changes in cervical cancer screening recommendations

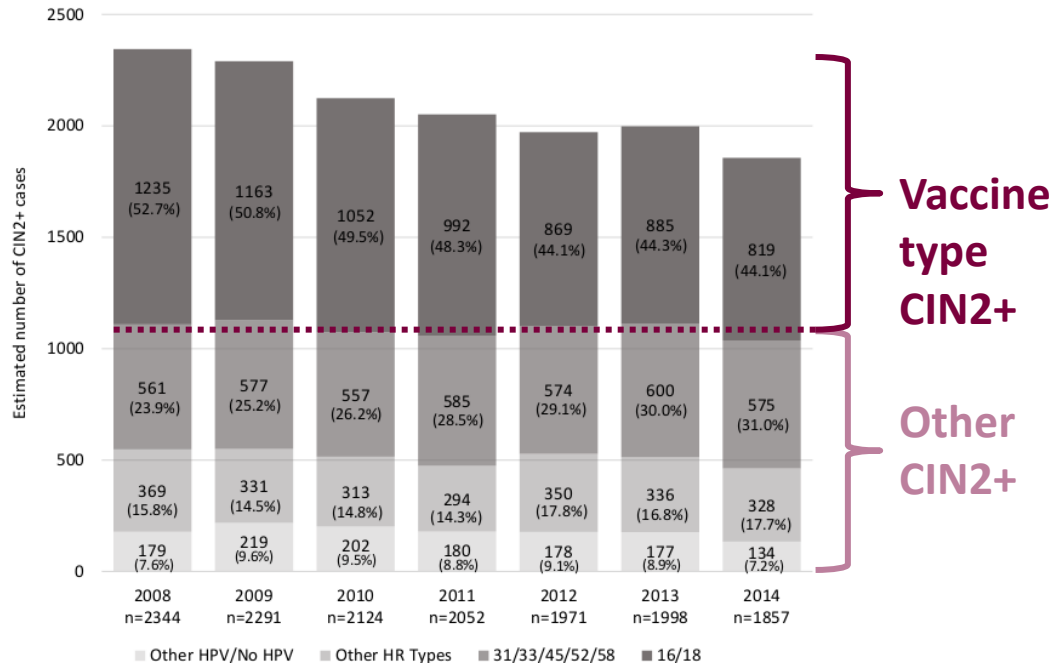
Show decreases in cervical precancers in young women
consistent with vaccine impact

Cervical Precancer Incidence Rates among Screened Women, HPV-IMPACT Project, 2008–2015

- CIN2+ rates decreased significantly in screened women aged 18–20 and 21–24 years
- CIN2+ rates increases in screened women in older age groups
- Could be attributable to:
 - Longer screening intervals and/or
 - Increased sensitivity of screening or diagnostic tests

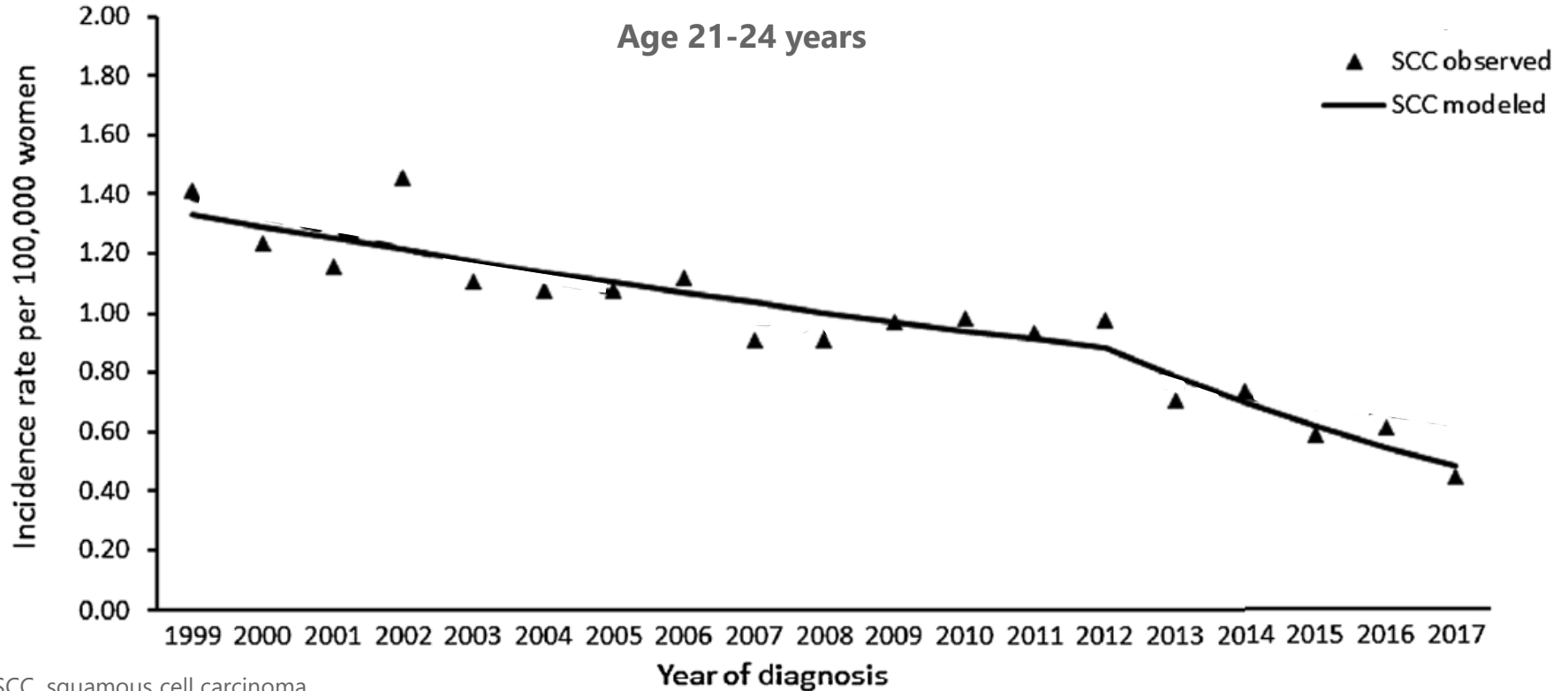


Precancer Declines Specific to Vaccine Types, Ages 18-39 Years



- Applied HPV type-specific proportions to actual number of reported CIN2+ cases
- Estimated proportion and numbers of vaccine-type CIN2+ cases have declined
- Estimated numbers of other CIN2+ cases approximately constant

Cervical Cancer Trends, United States Cancer Statistics



Summary

- Genital 4vHPV (6/11/16/18) prevalence has declined markedly among both vaccinated and unvaccinated young females
- Declines in HPV6/11 prevalence have resulted in a reduced incidence of JORRP
- Declines in HPV16/18 prevalence have translated into declines in cervical precancer incidence in young women
- Early impact on invasive cancer might be occurring
- Monitoring will continue to assess the impact of vaccination, including impact of 9vHPV vaccine

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Statistics/DHANES