HPV Vaccination in Washington:
Estimated Coverage, Missed Opportunities, and Provider Attitudes

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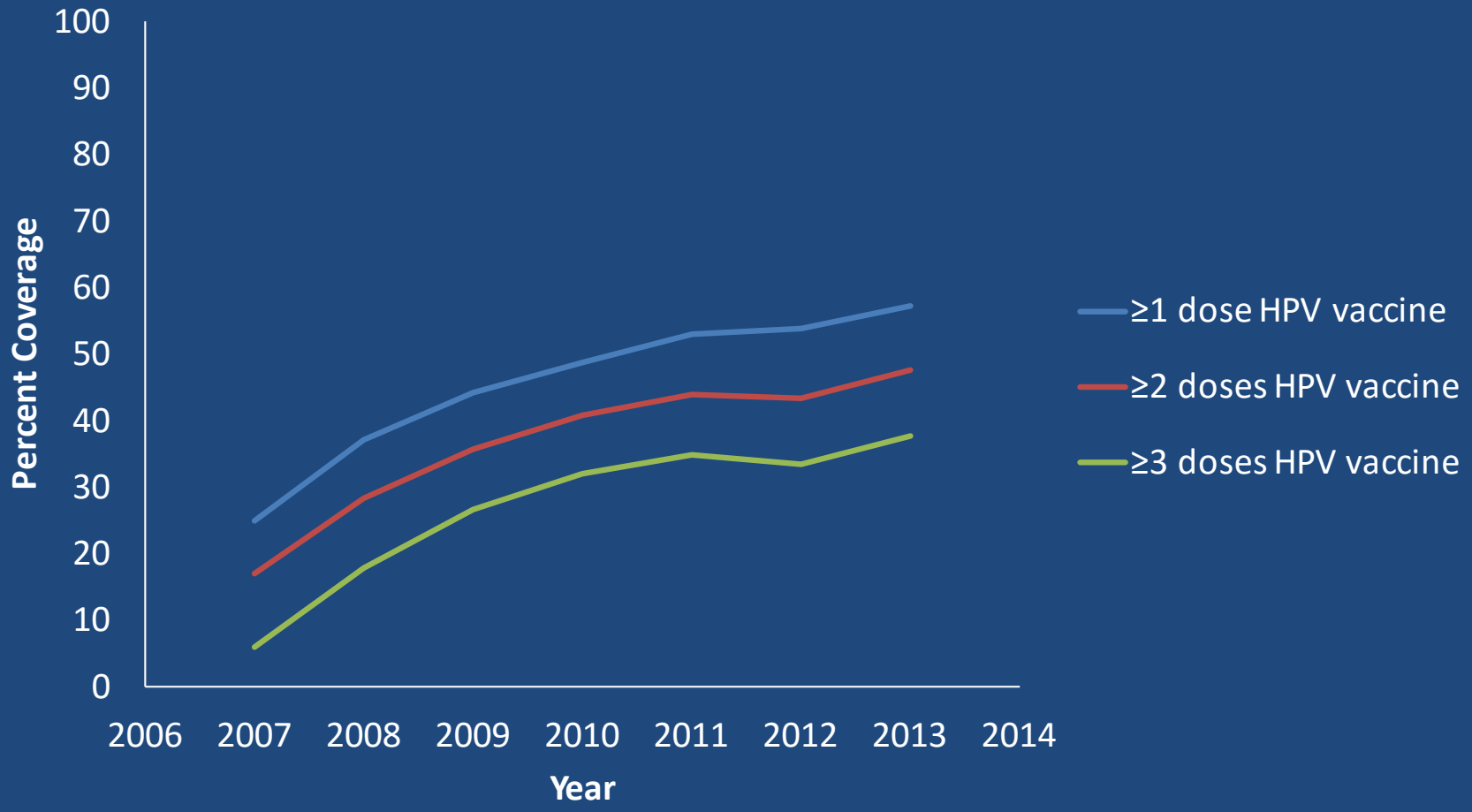
AIRA 2016

Estimated HPV vaccine coverage among adolescent girls aged 13–17 years — National Immunization Survey–Teen, United States, 2007–2013



- Available to females as of June 8, 2006

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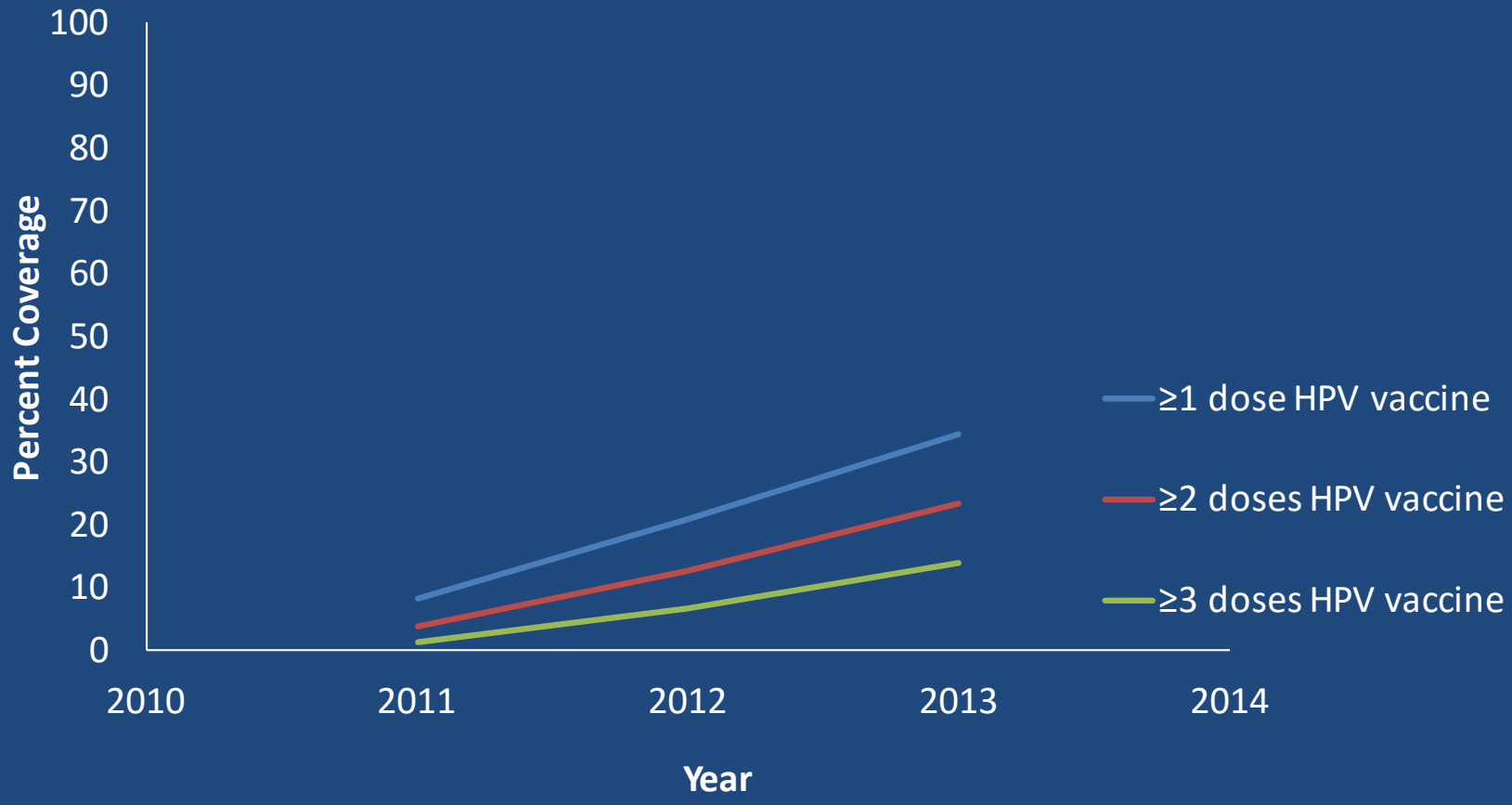
Estimated HPV vaccine coverage among adolescent boys aged 13–17 years — National Immunization Survey–Teen, United States, 2007–2013



- Available to males as of October 16, 2009

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Background

- 2014 – CDC named slow uptake of HPV vaccine one of the top 5 health threats
- A CDC document for state and local immunization programs detailed action areas for improving HPV vaccination rates
  - One action area was using state data for program decision making:

"If data on adolescent vaccination from your state immunization registry are robust, assess vaccination coverage levels and evaluate the frequency of missed opportunities."

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Project Goals

- Characterize patterns of HPV vaccine coverage and missed opportunities in Washington State
- Assess predictors for vaccine uptake and missed opportunities
- Identify areas for improvement in vaccination coverage and promotion
- Make recommendations to DOH for future interventions

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Methods

- Washington State Immunization Information System (IIS)
  - Links to vital records system, automatic input of electronic records
  - Providers input vaccination data and demographics
  - Estimated to cover 98% of children under 6
  - Estimated to cover 84% of adolescents aged 11-17 years
  - Used by 100% of public providers
  - Used by 81% of private providers

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Methods

- Estimated HPV vaccine coverage trends using IIS data for both males and females (2006-2013)
- Used census estimates as denominator
  - Overestimation of population in most counties by IIS
  - Difficulty determining active status (migration)
- Used 13th and 18th birthdays as time-points for on-time vs. catch-up doses
- Identified missed opportunities for HPV vaccination using IIS information
  - TDaP, MCV4, or influenza vaccine administration

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Methods

- Logistic regression models of HPV series initiation and completion by ages 13 & 18
  - Assessed childhood vaccinations and county-level population size & mean income as predictors of vaccination
  - Missing data for race

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Coverage Estimate Comparison

	NIS-TEEN National Estimate 2013 %,(95% CI)	NIS-TEEN WA Estimate 2013 %,(95% CI)	WA IIS/Census Estimate 2013 %,(95% CI)
Female	(Ages 13-17)	(Ages 13-17)	(Ages 13-17)
≥1 dose	57.3% (±1.9)	60.7% (±9.7)	60.6% (±0.2)
≥2 dose	47.7% (±2.0)	52.3% (±9.9)	48.3% (±0.2)
≥3 dose	37.6% (±1.9)	45.3% (±9.8)	35.0% (±0.2)
Male			
≥1 dose	34.6% (±1.9)	29.8% (±8.0)	34.4% (±0.2)
≥2 dose	23.5% (±1.7)	18.0% (±6.3)	21.4% (±0.2)
≥3 dose	13.9% (±1.4)	12.5% (±5.2)	11.5% (±0.1)

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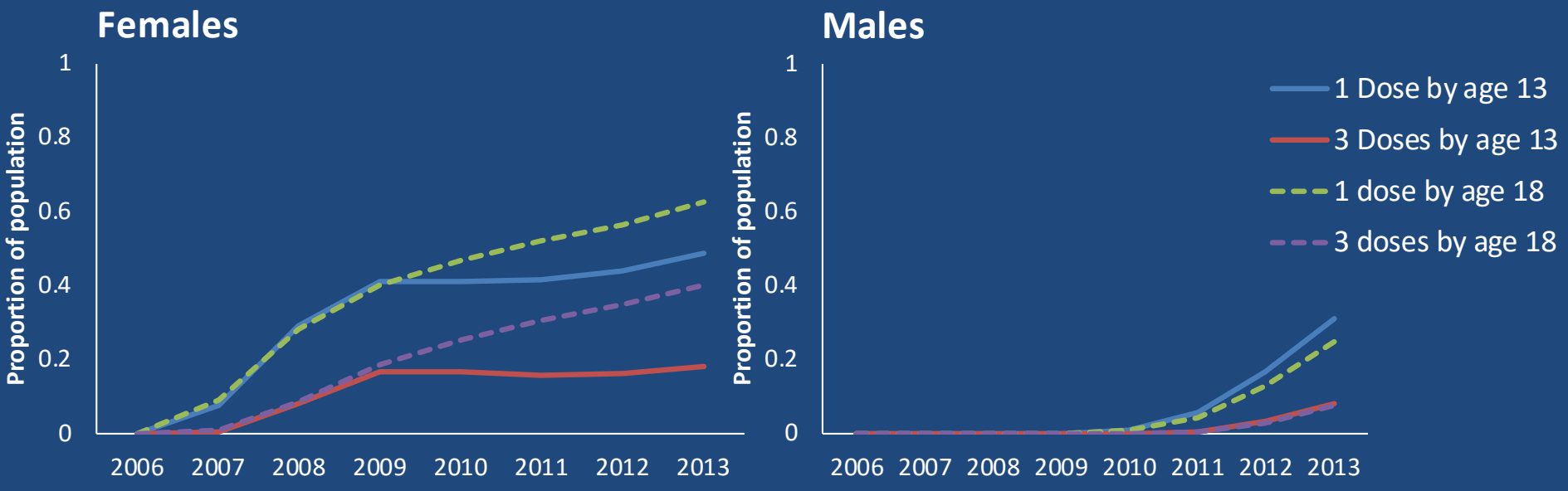
HPV Vaccine Coverage in WA



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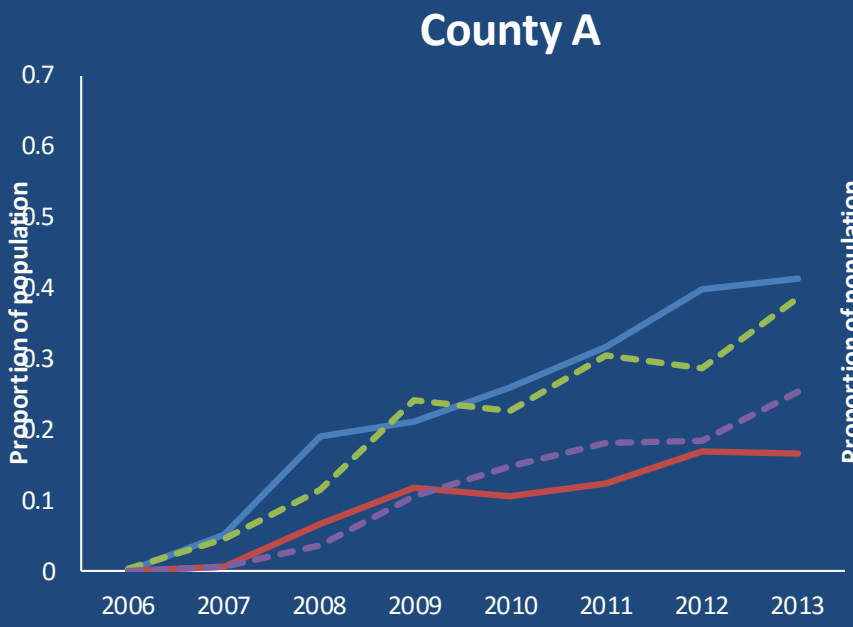
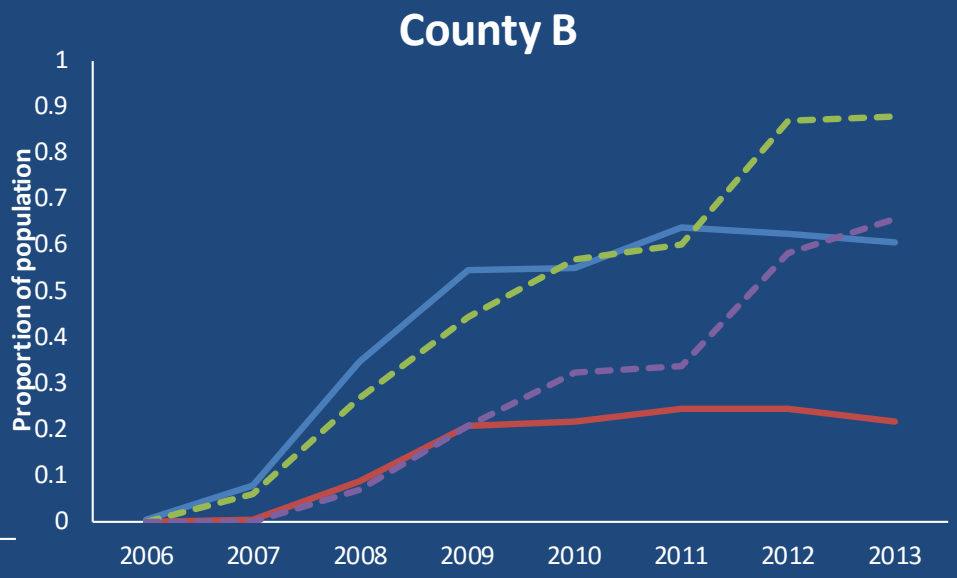
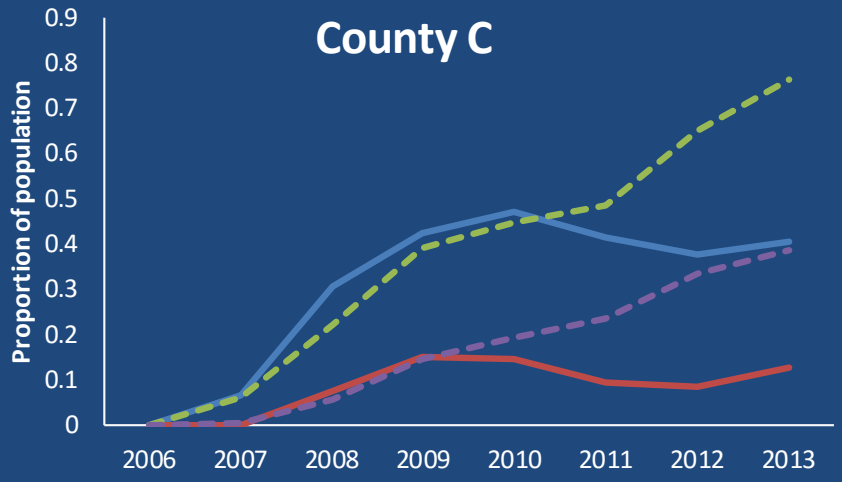
HPV Vaccine Coverage in WA (female)







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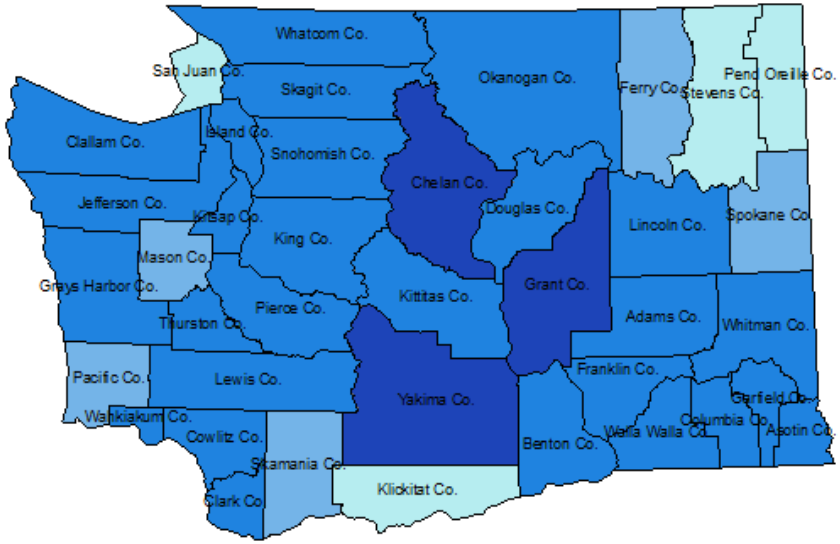
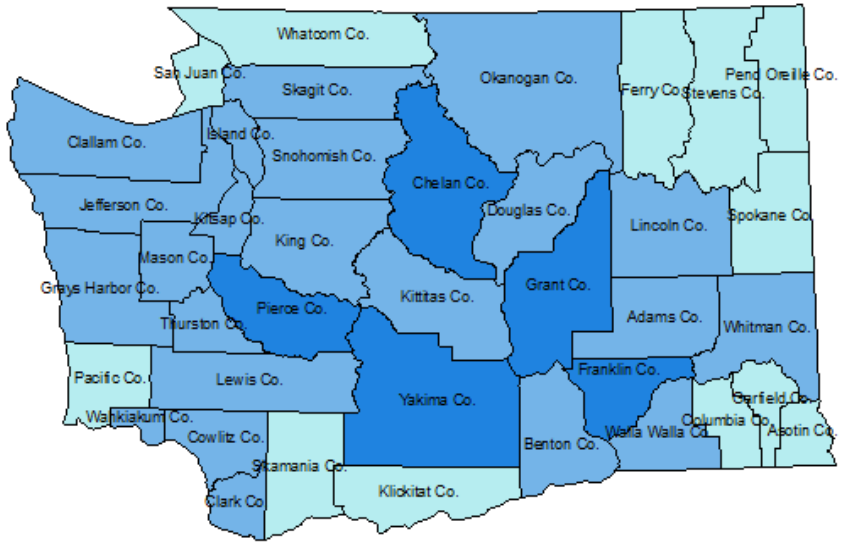
On-Time HPV Vaccine Series Initiation (by age 13): Females 2013



% Females with 1 dose HPV vaccine

- 7% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

On-Time HPV Vaccine Series Initiation (by age 13): Males 2013



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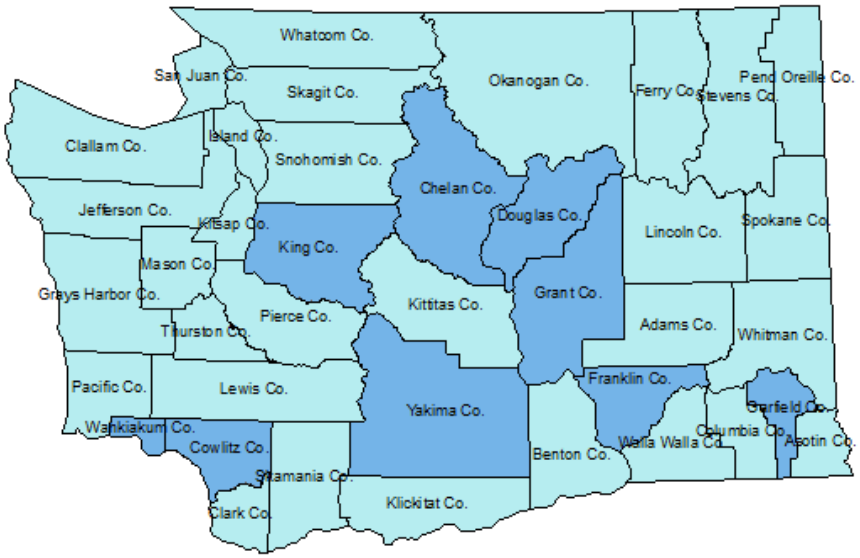
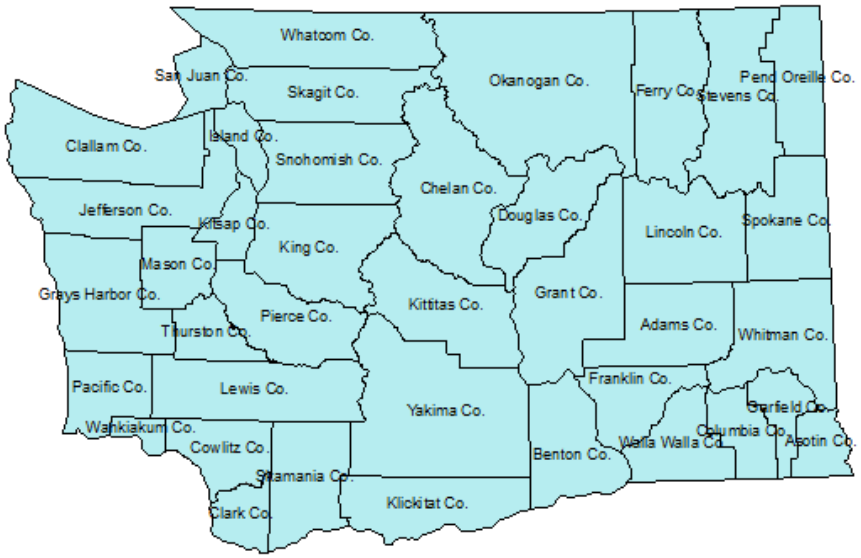
On-Time HPV Vaccine Series Completion (by age 13): Females 2013



% Females with 3 doses HPV vaccine

- 3% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

On-Time HPV Vaccine Series Completion (by age 13): Males 2013



% Males with 3 doses HPV vaccine

- 0% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

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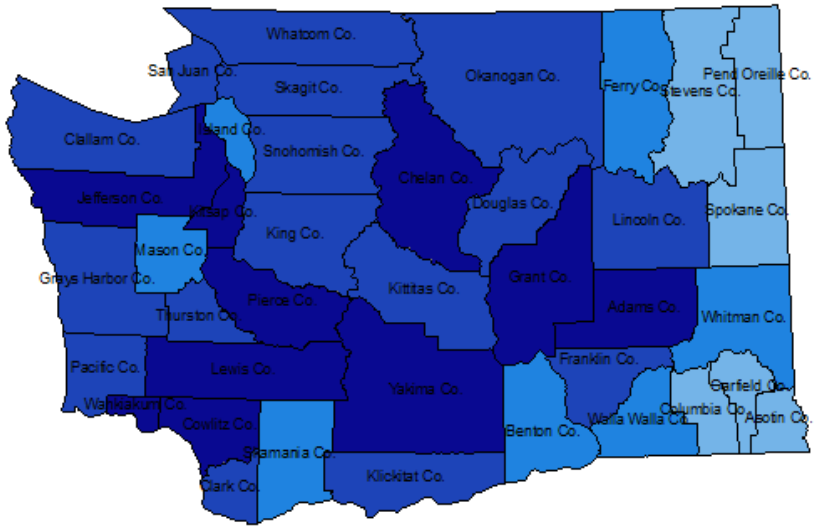
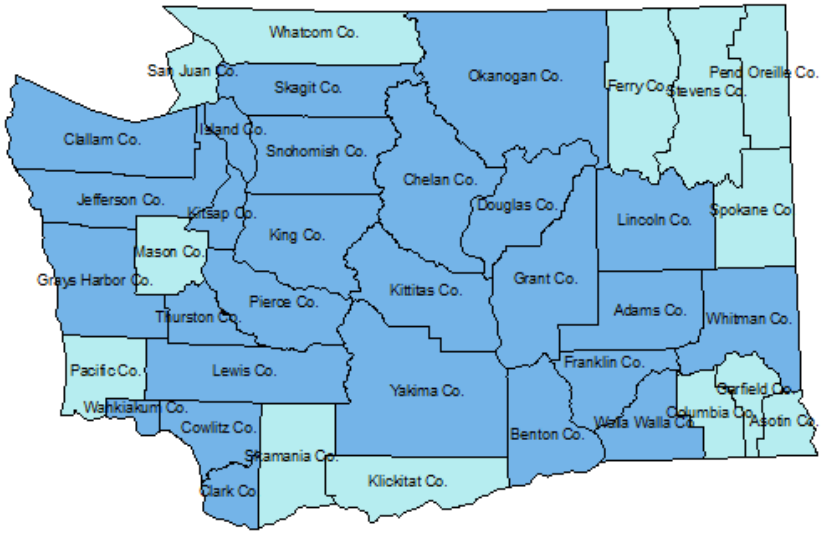
HPV Vaccine Series Initiation by age 18: Females 2013



% Females with 1 dose HPV vaccine

- 5% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

HPV Vaccine Series Initiation by age 18: Males 2013



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*Note: Kittitas, Walla Walla, Whatcom, and Whitman Counties have census estimates for 18 year olds that are much higher than expected, most likely due to the presence of universities in otherwise relatively small counties. The number of 17 year-olds in 2012 was used as a proxy denominator for these counties.

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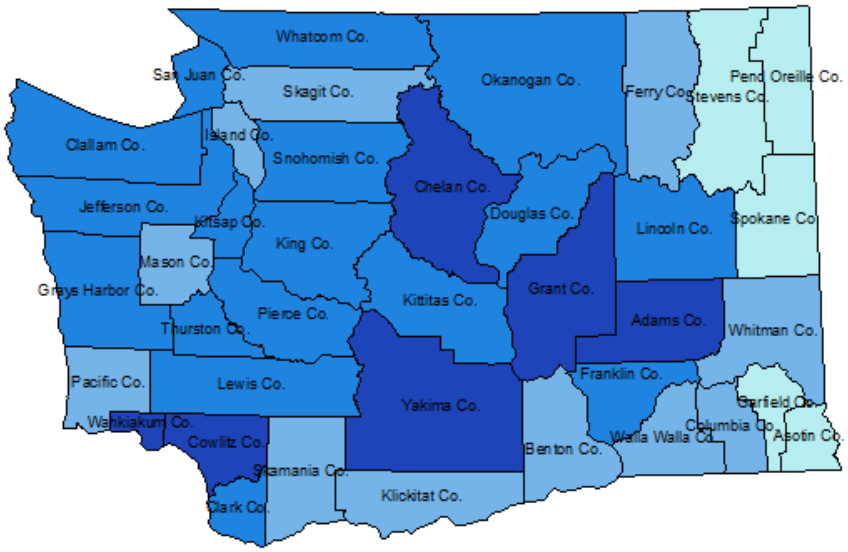
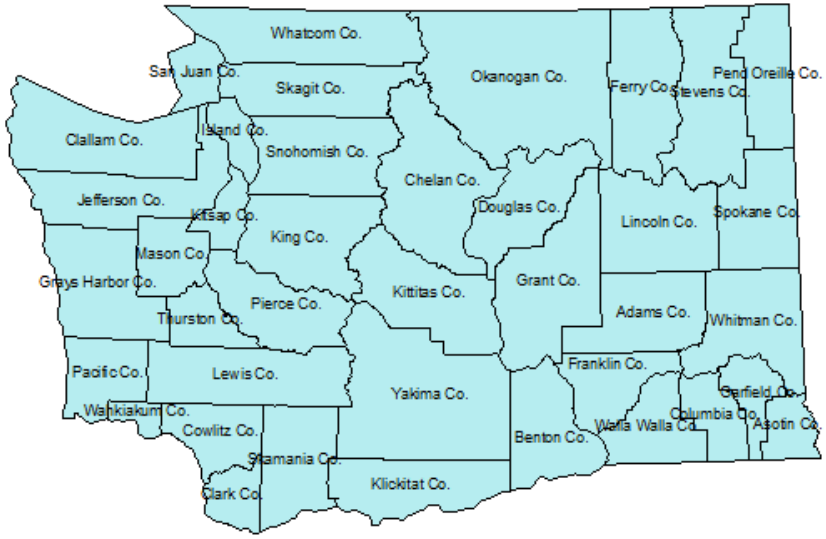
HPV Vaccine Series Completion by age 18: Females 2013



HPV Vaccine Series Completion by age 18: Males 2013



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All ages (11-17), HPV unvaccinated adolescents with ≥1 missed opportunity* for first dose of HPV vaccine

Number of Missed Opportunities	N=Females[a] (% of total eligible, n=420,303)	N=Males[b] (% of total eligible, n=414,444)
1	86711 (20.6)	97270 (23.5)
2	28936 (6.9)	35030 (8.5)
3	11086 (2.6)	14811 (3.6)
4	5318 (1.3)	7381 (1.8)
5	3087 (0.7)	3943 (1.0)
≥6	3,217 (0.8)	2,003 (0.5)
Totals	136738 (32.9%)	159568 (38.7%)

*A missed opportunity is defined as a healthcare visit for an eligible adolescent at which another adolescent vaccine was administered (TDaP, Influenza, or MCV4), without corresponding administration of the HPV vaccine

[a] For females, the vaccine licensing date of June 8, 2006 was used as the first date at which a missed opportunity could occur

[b] For males, the vaccine licensing date of October 16, 2009 was used as the first date at which a missed opportunity could occur

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Logistic Regression Modeling of Series Initiation & Completion

- Childhood vaccination* is associated with HPV series initiation and completion
  - Predictors: All childhood doses complete, at least one of each vaccine type complete, at least one dose complete
  - At ages 13 & 18 for both sexes
  - May be confounded by who has vaccine doses entered in registry
- No clear pattern by median county income or county population size

*MMR, Polio, & DT vaccines given before age 7

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Provider Survey

- Assessed provider recommendation practices by patient age group and sex
- This study found that providers were significantly more likely to recommend vaccine:
  - to females than to males (all ages)
  - to 13-18 year-olds than 11-12 year olds (both genders)

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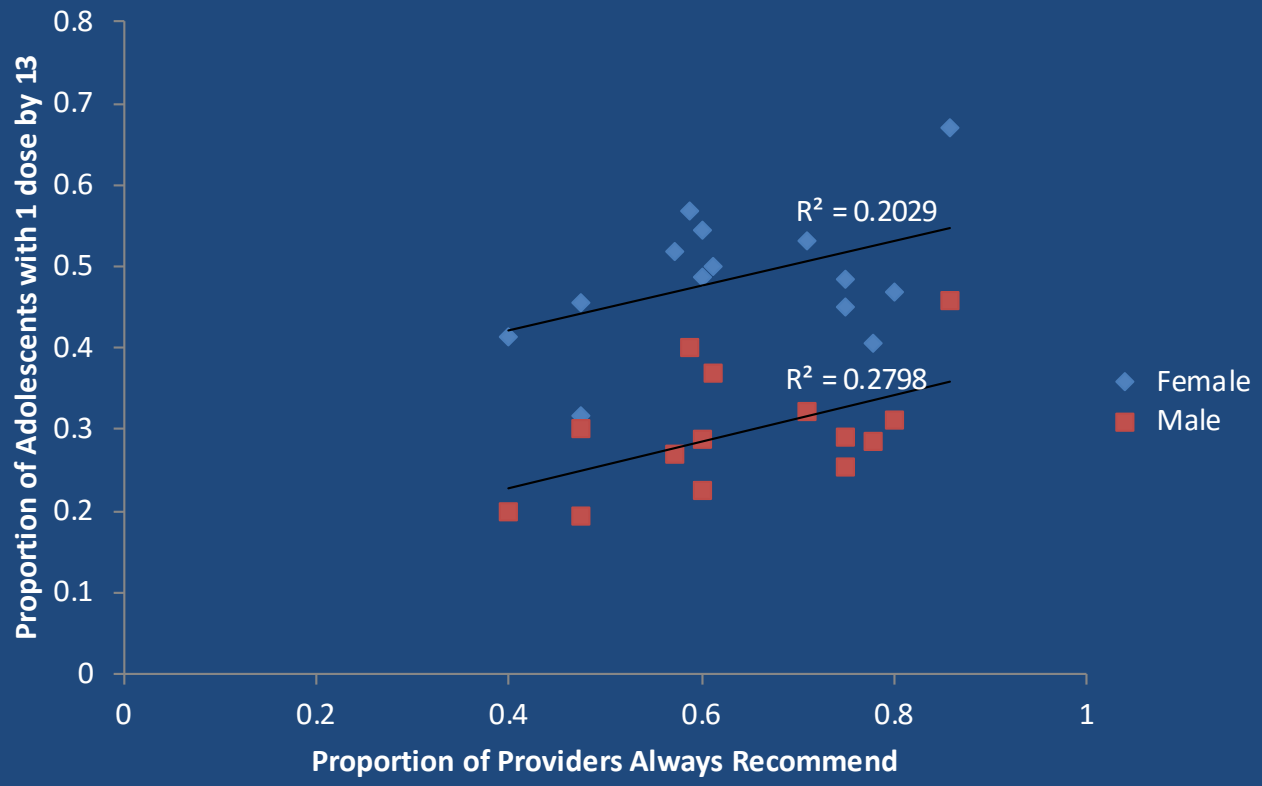
Provider Survey

- We used data from both studies to compare the proportion of county providers who report always recommending HPV vaccine to the proportion of 13 year olds in a county with 1 dose



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Discussion

- WA state vaccination coverage is similar to national averages
- On-time vaccination plateaued over time
- Missed opportunities occur in at least a third of adolescents
- HPV vaccination coverage varies by sex, age, and county of residence
- Strengths: high coverage of IIS, use of state-wide data instead of survey data, assessment of on-time vaccination
- Limitations: 84% coverage, denominator difficulties, lack of info on all healthcare visits & other individual data

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Conclusions

- Information on varying vaccination coverage by age, sex, and county should be used to target programs and interventions
- Further research is needed to understand predictors of plateauing on-time vaccination and geographical variation
- Continued educational efforts for providers

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Acknowledgements

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  - Marcia Goldoft
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