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HPV Vaccination: Educating and Empowering the Next Generation

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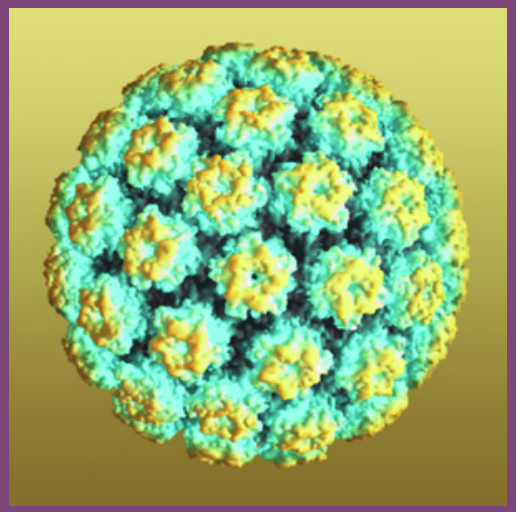

HPV Vaccination: Educating and empowering the next generation

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Current state of HPV Vaccination

- HPV vaccination with Gardasil 9 approved for males (ages 11-21) and females (ages 11-26) which protects against 90% of strains that cause genital warts and 70% of strains that cause cervical cancer[7]
- Effective HPV vaccination:
  - Within 6 years of vaccine introduction, 64% reduction of HPV type prevalence in females aged 14-19 and 34% reduction in those aged 20-24[1]
- According to rates compiled by the CDC, burden of cervical cancer disproportionately affects Hispanic women in Connecticut[10]

Cancer Sites	Sex	Race	Ethnicity	Count	Population	Age-Adjusted Rate Per 100,000 95% Confidence Interval
Cervix Uteri	Female	Black or African American	Non-Hispanic	52	745,790	7.5 (5.5 - 9.8)
Cervix Uteri	Female	White	Hispanic	76	794,810	11.4 (8.9 - 14.5)
Cervix Uteri	Female	White	Non-Hispanic	308	5,321,259	5.3 (4.7 - 5.9)

HPV Vaccination in CT

TABLE 3. Estimated vaccination coverage with selected vaccines and doses* among adolescents aged 13–17 years,† by HHS region and state or selected local areas — National Immunization Survey–Teen (NIS-Teen), United States, 2014

HHS region and state/local area	≥1 Tdap§ % (95% CI)¶¶	≥1 MenACWY¶ % (95% CI)	Females (N = 10,084)			Males (N = 10,743)		
			≥1 HPV** % (95% CI)	≥2 HPV†† % (95% CI)	≥3 HPV§§ % (95% CI)	≥1 HPV** % (95% CI)	≥2 HPV†† % (95% CI)	≥3 HPV§§ % (95% CI)
United States overall	**87.6 (±0.9)*** **	**79.3 (±1.1)*** **	**60.0 (±1.9)*** **	**50.3 (±1.9)*** **	**39.7 (±1.9)*** **	**41.7 (±1.8)*** **	**31.4 (±1.7)*** **	**21.6 (±1.6)*** **
HHS Region I	93.0 (±1.8)	90.8 (±1.8)***	67.8 (±4.6)	61.0 (±4.8)***	49.0 (±5.0)***	54.1 (±4.7)	44.4 (±4.7)***	29.0 (±4.2)***
Connecticut	94.8 (±3.2)	94.9 (±3.0)	63.5 (±8.5)	59.9 (±8.7)	48.5 (±9.1)	50.3 (±9.0)	38.4 (±8.7)	27.0 (±7.8)
Maine	85.4 (±4.7)	73.6 (±5.7)	66.8 (±8.1)	52.9 (±8.7)	43.0 (±8.6)	53.1 (±9.0)	42.5 (±8.8)	27.5 (±7.6)***
Massachusetts	93.2 (±3.4)	92.1 (±3.3)	69.0 (±8.5)	62.5 (±9.0)***	49.5 (±9.2)	54.3 (±8.5)	46.2 (±8.6)	27.3 (±7.7)
New Hampshire	94.4 (±2.6)	90.6 (±3.2)	71.0 (±7.2)	61.2 (±7.9)	50.1 (±8.4)	56.1 (±7.8)***	46.9 (±7.9)***	33.0 (±7.6)***
Rhode Island	92.4 (±3.4)	94.1 (±3.2)	76.0 (±7.7)	67.8 (±8.2)	53.7 (±8.5)	69.0 (±7.5)	56.8 (±8.1)	42.9 (±7.9)
Vermont	93.4 (±3.3)	81.3 (±5.1)	63.4 (±8.9)	55.8 (±9.2)	49.8 (±9.2)	50.5 (±9.3)	40.5 (±9.1)***	30.5 (±8.4)

- Both initiation and completion of HPV vaccination in CT are suboptimal[5],
- Healthy People 2020 goal for HPV Vaccination: 80% for females and males[2,5]

Is the vaccine cost effective?

- Currently $8 billion dollars spent in U.S. for the cost of screening for cervical cancer and follow-up, cervical cancer, oropharyngeal cancer, anogenital warts, and recurrent respiratory papillomatosis[3]
- HPV associated with 100% of cervical cancer, 90% of anal cancer, 40% vulvar/vaginal cancer, 12% oropharyngeal cancer, 3% oral cancer[2]
  - Incremental Cost Effectiveness Ratio of implementing HPV Vaccination in ages 12 and above with current cervical cancer screening as compared to screening alone was under $50,000 per QALY (quality-adjusted life year)[2]
    - Considered cost-effective
  - For women under 21, the ICER was under $100,000 per QALY[2]
- Vaccination is covered by insurance ($360 for 3 shots)

Expert Opinion

National AHEC Organization
HPV Immunization Project

AHEC Southwestern Connecticut

Program Manager- Immunization and Fund Development, Southwestern AHEC

- Current initiative: "You Are the Key to HPV Cancer Prevention." National AHEC Program[4]
  - Parents surveyed state main barriers to HPV Vaccination:
    - Lack of strong physician recommendation
    - HPV Education for the community
  - Work with physicians to provide tools to educate parents and strongly recommend HPV Vaccination in similar fashion as TDaP and other vaccination

Expert Opinion

- Public Health Official in Vaccine Promotion Campaign
  - "There's been a shift in CDC focus recently in HPV Vaccination Campaigns. Improving physician recommendation is vital to improving rates. Currently physicians are cherrypicking and vaccinating who they believe is at risk."
  - "Parents simply don't know enough about HPV."
  - "The CDC is currently focused on initiation of vaccine series more so than the completion of the series. It's difficult to get adolescents into the office multiple times."
  - "If you look at places that mandate the vaccine, you can see improvement in not only vaccination rates but also attitudes towards the HPV Vaccine."
  - "Potential ideas for initiatives include educating high schoolers about HPV so they can speak with middle schoolers in a peer-to-peer education model"

Intervention

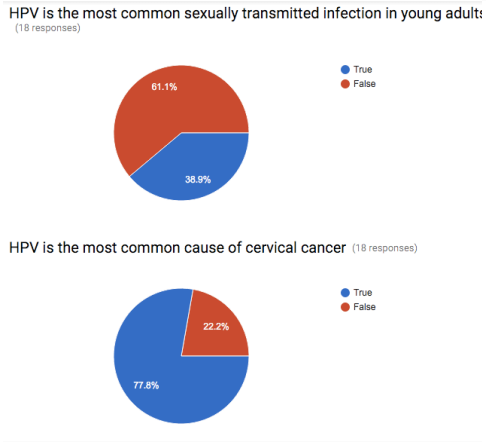
- CT AHEC Network AmeriCorps conducts biweekly session with high school students interested in health care professions regarding health disparities and public health
  - Danbury High School and Henry Abbott Technical High School
- Several students stated, *"I don't even know what HPV is"*
- **INTERVENTION**: Educational, interactive afterschool didactic sessions
  1. ***Educate*** students about HPV, associated health risks, and the vaccine
  2. ***Engage*** students in *problem solving* to address barriers to HPV vaccination and solutions at the community, health care, and national level
  3. ***Evaluate*** efficacy via pre- and post-survey (8 T/F questions and fill in the blank)

Qualitative Results

- Population n=18, ages 14-18, females n=17
  - Pre survey response rate: 100%
  - Post survey response rate: 44%**
- **Prior** to didactic session, perceived barriers to HPV vaccination:
  - "Parents think it'll cause cancer"
  - "Side effects"
  - "Parents think they're too young"
  - "Parents scared of vaccines, lack of health care"
- **Post didactic** session, students believed low rate of vaccination is due to:
  - "Lack of education, they don't understand STIs"
  - "**Doctors are not convincing enough**"
  - "**Educating parents** and **children**"

Quantitative Results

Pre



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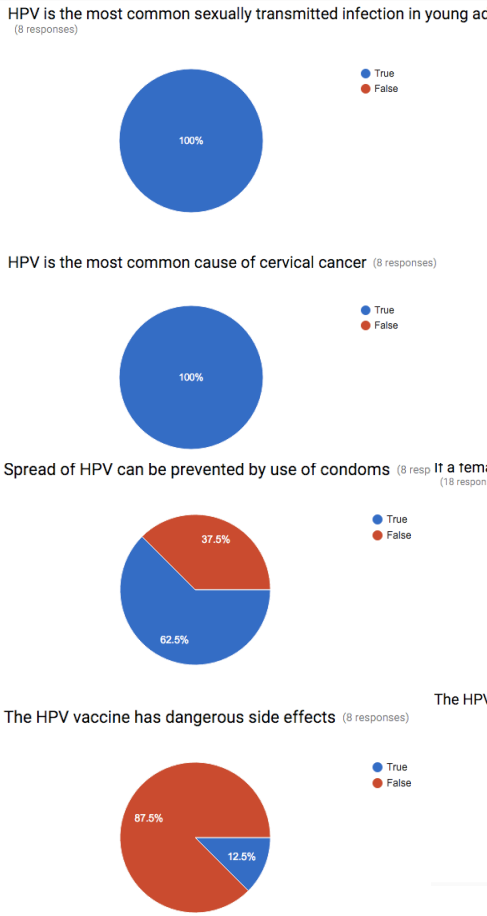
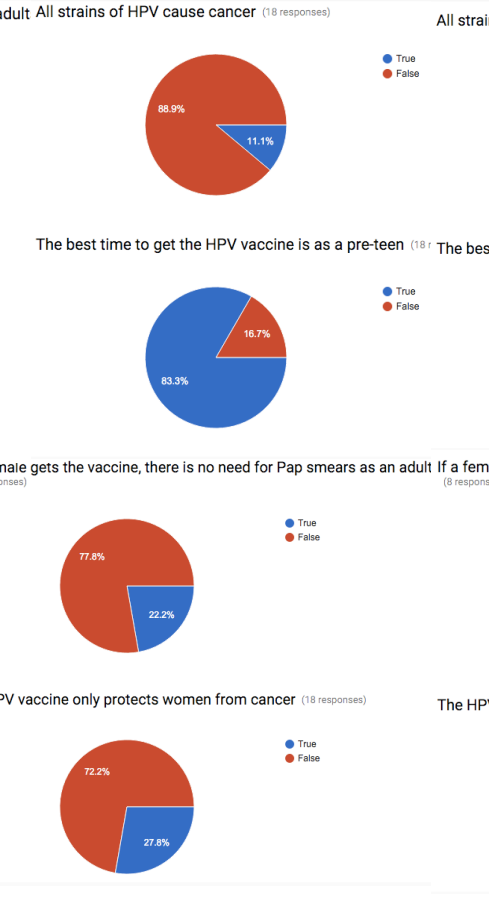


Pre



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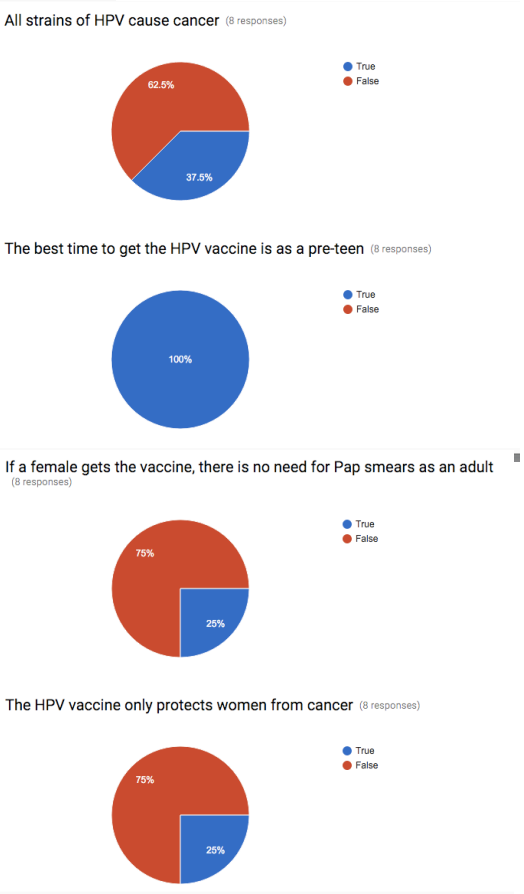

- Student knowledge of when HPV vaccine should be administered was high pre and post lesson.
- Association between HPV and cancer strengthened.
- Still need to emphasize that use of condoms cannot completely prevent HPV transmission.

Evaluation

- Students expressed better understanding of HPV, vaccination rates, and barriers to care
- Students scored an average of 55% on the pre-survey and 80% on the post-didactic survey (p =0.001)
  - Session provided **significant improvement** in HPV knowledge
- Didactic sessions well received: *"I really enjoyed the presentation, you did a great job. Thanks for sharing all the important information on the HPV vaccine. I found it very interesting!"*
- Students empowered to become health educators in their own right
- Minimal improvement in understanding spread of HPV

Limitations

- Student population interested in healthcare, more knowledgeable than average high school student
- Population 94% female (n=18)
- Due to time constraints, inability to coordinate educational session for **parents** and understand their concerns
- Short term evaluation of knowledge
- Poor response rate in post-survey

Looking forward…

- Educational session addressing concerns of parents in relation to HPV and vaccination. (Difficult to organize in 5 weeks).
- Utilizing motivated high school students to educate the community about HPV Vaccination and cervical cancer screening

- Implementation of "3 to Complete Reminder Program" by Gardasil which sends text reminders to parents when subsequent doses are due to help complete the series.[3]
- Implementation of HPV vaccine series as part of adolescent preventative checklist
  - Tracking of HPV vaccination rates at Brookfield Family Practice

The Bigger Picture

- Rhode Island has mandated HPV vaccination for entry into 7th grade with completion by 9th grade[8]
  - Rates of vaccination in RI and D.C. where mandates occur have highest rates of vaccination among males and females
  - Legal mandates may lead to higher vaccination rates
    - Could eventually change attitudes towards HPV
- Survey attitudes towards HPV vaccination in states with mandates versus without mandates
- Cervical cancer disproportionately affects low and middle income countries where screening is not readily available[6]
  - Worldwide HPV Vaccination and education campaigns are extremely cost effective

References

1. Markowitz, L. et al. Prevalence of HPV after Introduction of Vaccination Program in the United States. Pediatrics. March 2016.

2. Kim., J. Goldie, S. Health and Economic Implications of HPV in the United States. *New England Journal of Medicine. 2008. 21:359(8): 821-832.*

3. Chesson, HW, Ekwueme, DU, Saraiya M, Watson M, Lowy DR, Markowitz, LE. Estimates of annual direct medical costs of the prevention and treatment of human papillomavirus in the United States. *Vaccine.* 2012. 14:30(42):6016-9.

4. "You are the Key to HPV Cancer Prevention." National AHEC HPV Immunization Project. Linda Niccolai. Yale School of Public Health.

5. MMWR. National, Regional, State and Selected Local Area Vaccination Rates Among Adolescents Aged 13-17 years-United States, 2014. CDC. Vol 64 (29); 784-792.

6. Jit, B., Brisson, M., Portnoy, A., Hutubessy, R. Cost-effectiveness of Female Human papillomavirus vaccination in 179 countries: a PRIME modeling study. *Lancet Global Health.* 2014. S2214-109X(14)70249-9

7. "3 to Complete Reminder Program." Gardasil. https://www.gardasil.com/why-3-doses/dosage-reminders-gardasil/

8. Healthy People 2020. www.healthypoeple.gov

9. Rules and Regulations Pertaining to Immunization and Communicable Disease Testing in Preschool, School, Colleges, or University. Rhode Island Department of Health. July 2014.

10. CDC. United States Cancer Statistics 1999-2011.