



Epidemiology of HPV infection and anal cancer

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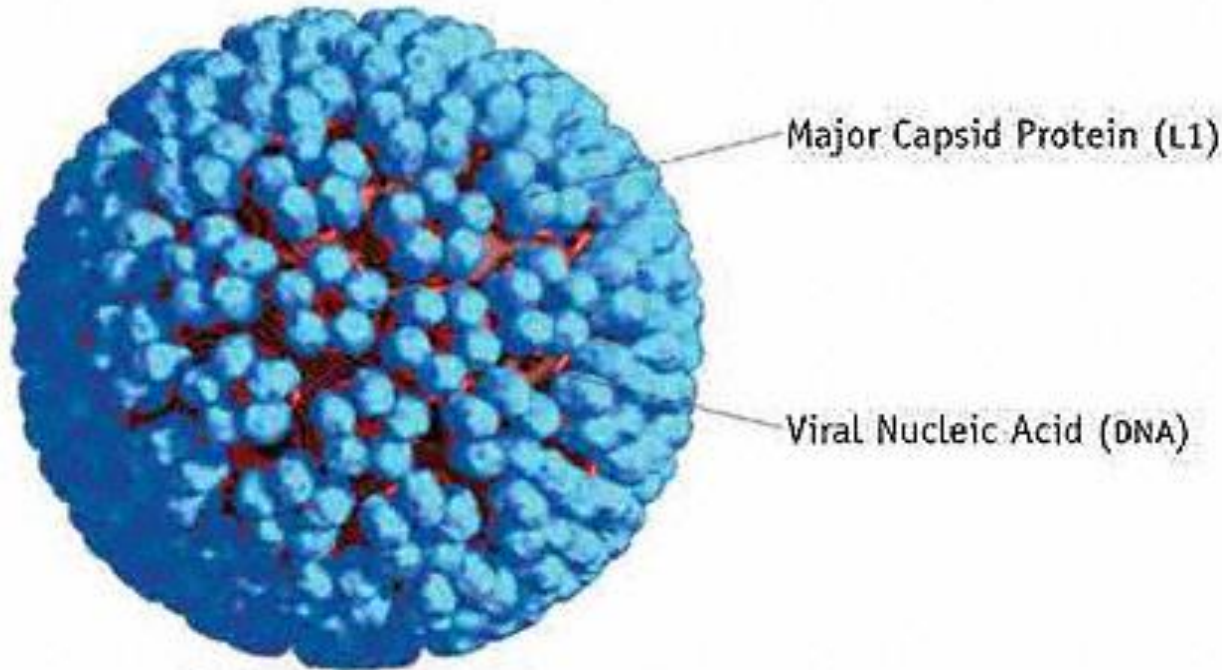
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Human Papillomavirus (HPV)

THREE-DIMENSIONAL MODEL OF HUMAN PAPILLOMAVIRUS



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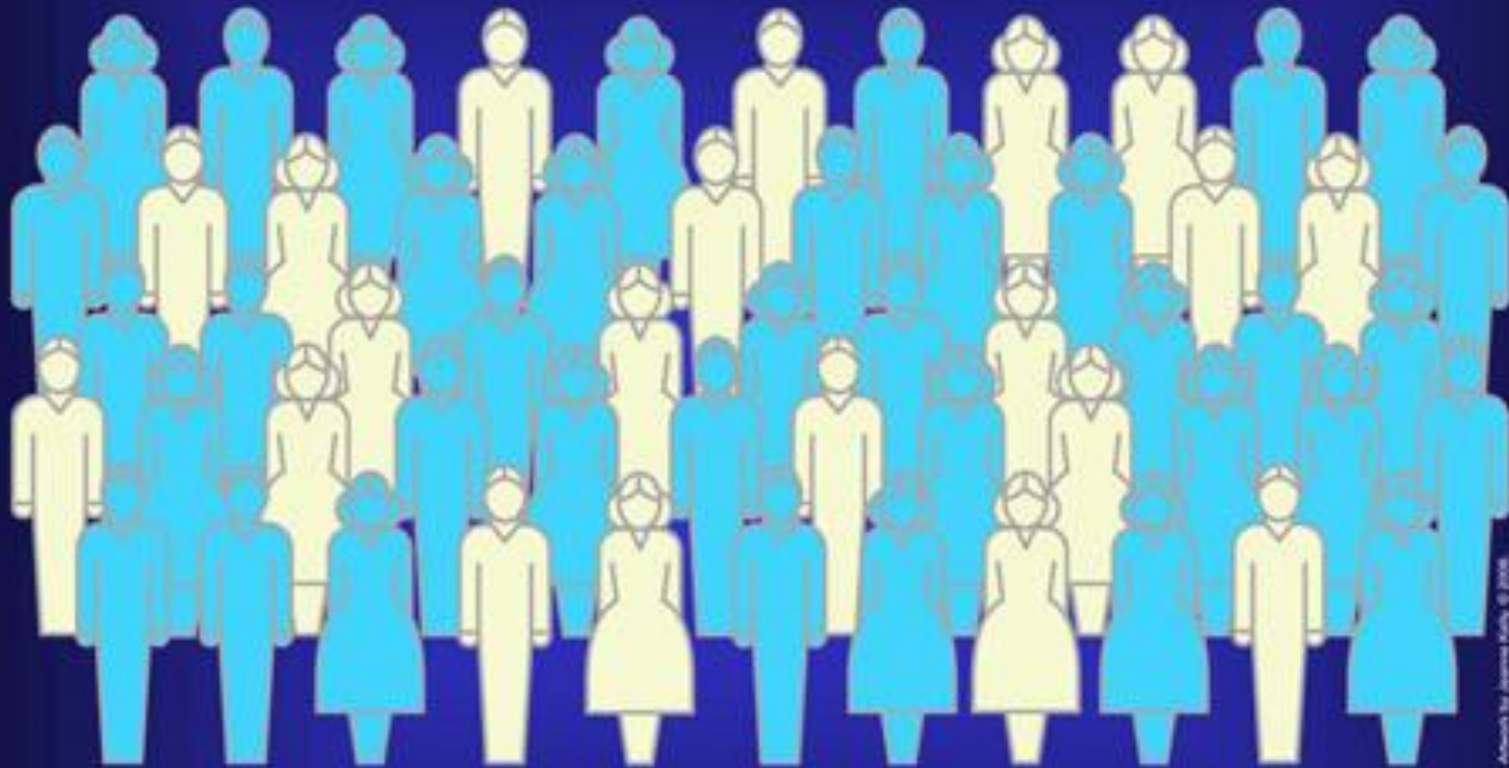
Three-dimensional model of HPV Created by Louis E. Henderson, PhD,
Frederick Cancer Research Center.

- HPV is a double-stranded DNA virus that replicates in the nucleus of squamous epithelial cells

HPV

- HPV are a group of more than 100 viruses.
- Sexually transmitted, **high-risk** HPVs include types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 69, and possibly a few others.
- Low-risk types associated with genital warts include types HPV-6 and HPV-11.

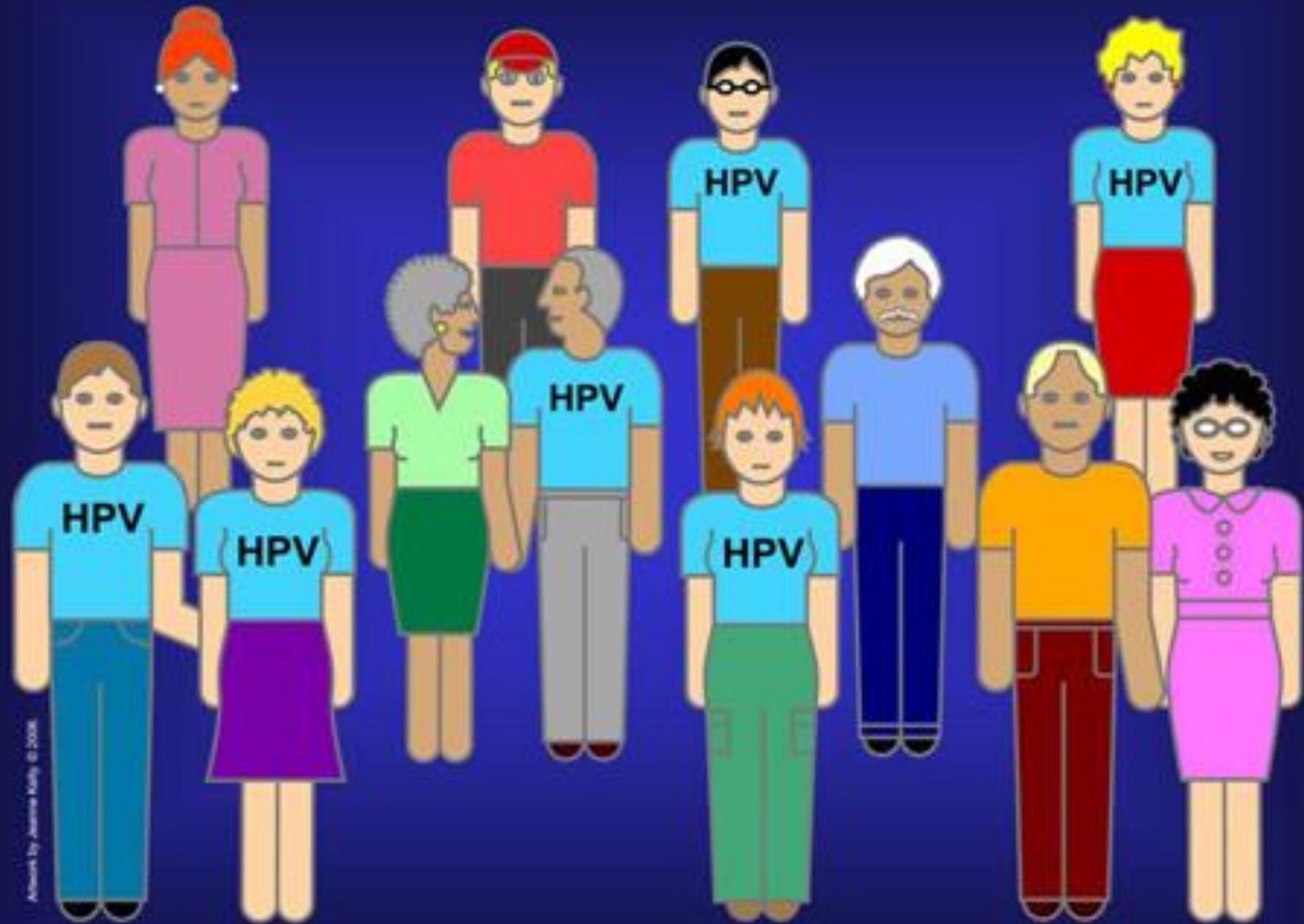
Common Infection



■ Infected with HPV

***80% of sexually active persons infected at some point

Infection Is Sexually Transmitted



Adapted by Jennifer Kelly © 2008

- Over 30 types can be passed from one person to another through sexual contact.

HPV and cancer

- ❑ 5.2% of world-wide cancer incidence HPV related
- ❑ Associated to cancer of the cervix, anus, vulva and vagina, penis, mouth, and oro-pharynx.
- ❑ Current estimates of the population attributable fraction in the US are very high (MMWR, 2012):
 - ❑ 96% for cervical
 - ❑ 93% for anal
 - ❑ 51% for vulvar
 - ❑ 64% for vaginal
 - ❑ 36% for penile
 - ❑ 63% of oropharyngeal cancer

Economic Impact Related to HPV-Associated Disease, 2010

Event	Cost (\$ billions)
Cervical cancer screening*	6.6
Cervical cancer	0.4
Other anogenital cancers	0.2
Oropharyngeal cancer	0.3
Anogenital warts	0.3
RRP**	0.2
TOTAL	8.0

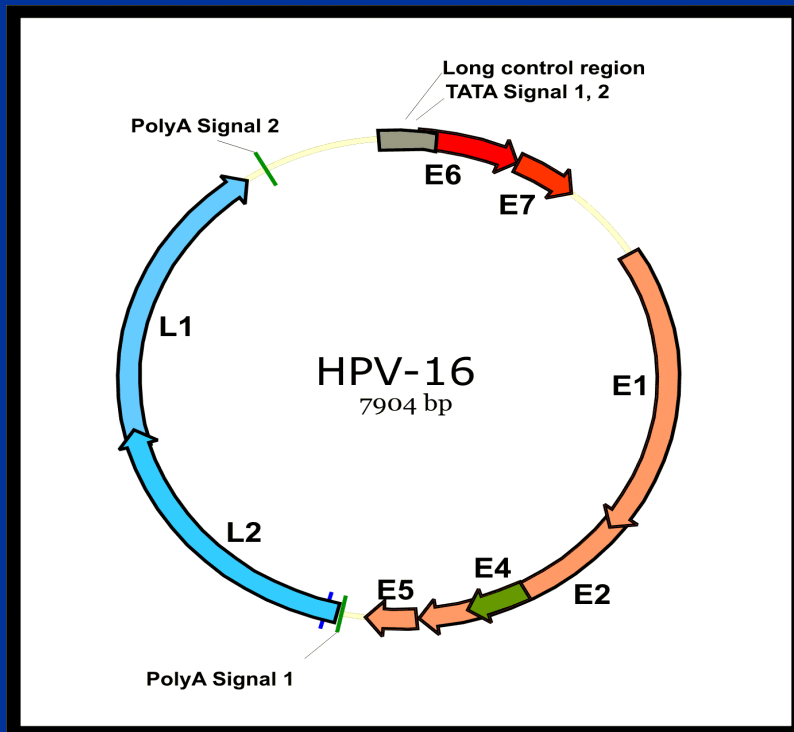
***Cervical cancer screening costs: ~ 80% routine screening, ~20% follow-up**

****RRP costs: ~ 70% juvenile-onset, ~ 30% adult-onset**

HPV Cycle

➤ The virus infects the basal layer of the epithelium via minor abrasions in the skin. It enters the cell, uncoats and delivers its DNA to the cell's nucleus.

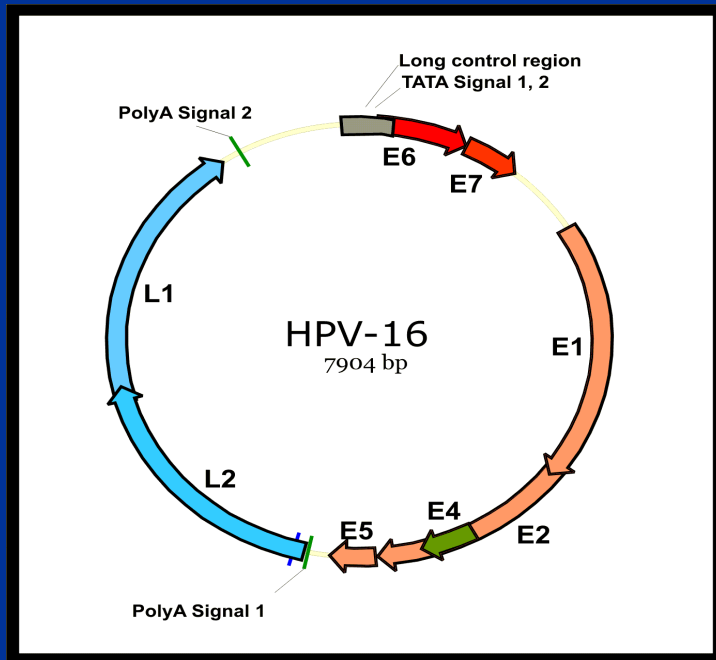
- The first genes to be expressed are E6 and E7
 - involved in cell transformation and precancerous changes
 - E6 binds to and inhibits p53, which suppresses the cell cycle in the event of DNA damage and also triggers apoptosis
 - E6 also activates cellular telomerase and this allows the cells to replicate continuously.
 - E7 promotes cell division by binding to Rb, a tumour suppressor protein that usually binds to and inactivates a transcription factor E2F. E2F unbound from Rb causes transcription of genes involved in DNA replication and cell division.



HPV Cycle

➤ The infected basal cells divide and their progeny take HPV DNA with them.
During the early phases of infection the copy number of the viral genome is between 50 and 100

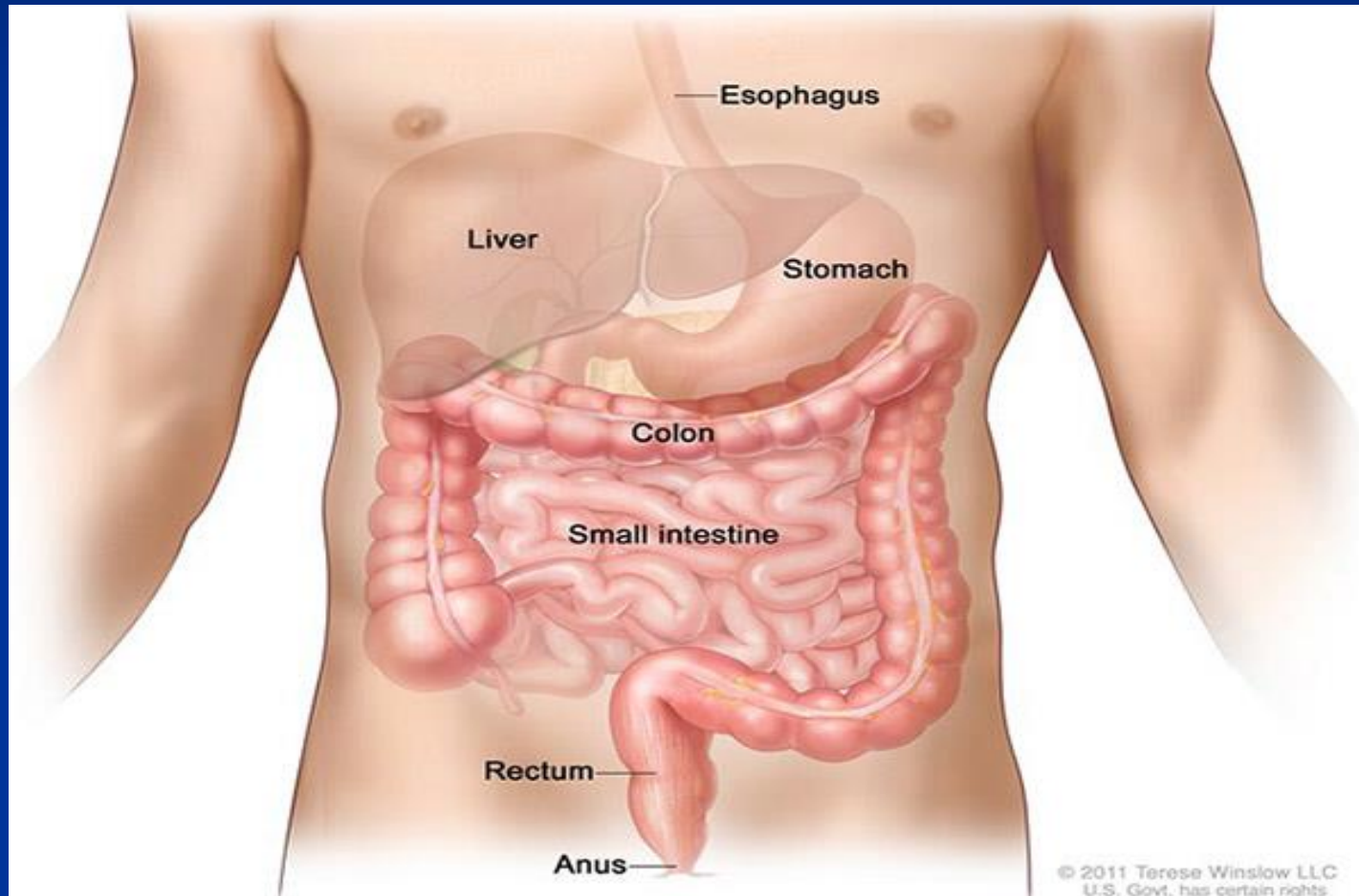
- As the infected cells differentiate, the remainder of the early genes become switched on.
- As the cells approach terminal differentiation the late genes, L1 and L2, are activated - they encode the major and minor viral capsid proteins (respectively).
- By this point the viral copy number has been drastically increased so that thousands of virus particles are produced per cell.
- As these cells approach the surface of the skin they are sloughed off, and the virus particles are released to infect other cells and spread to other hosts.



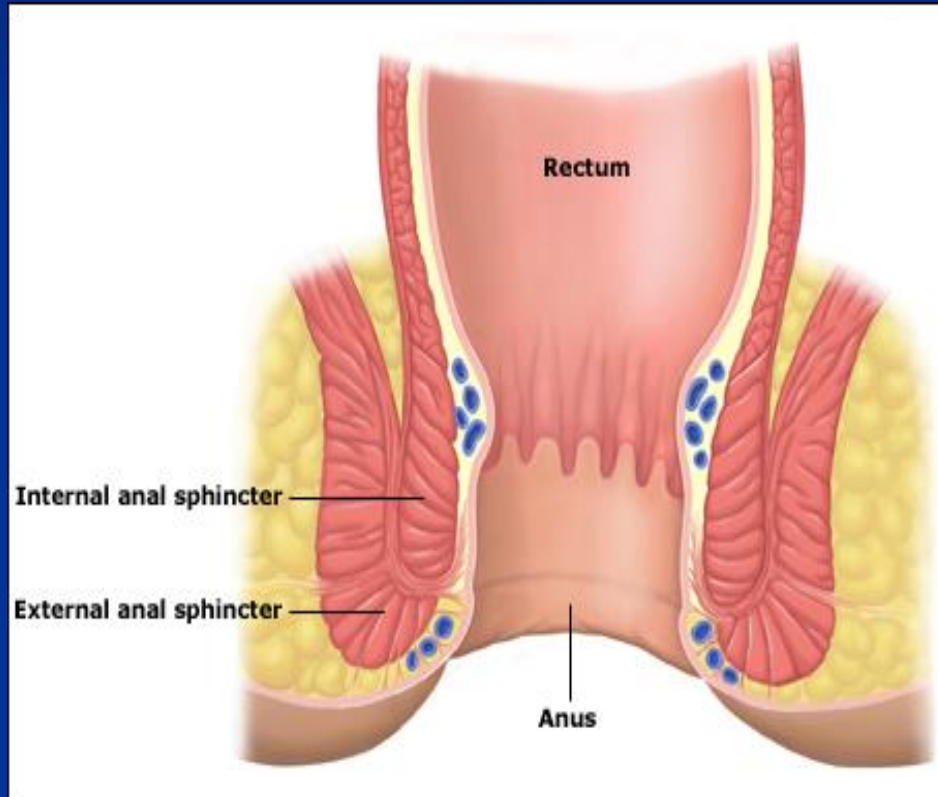
Anal Disease



Anus



Anal canal



- HPV replicates in the nucleus of squamous cells.
- Transition (or transformation) zone is an area of constant metaplasia (from squamous anal epithelium to columnar rectal epithelium) and particularly prone to development of atypia and neoplasia.

Symptoms of Anal Cancer

- No symptoms at all in many cases
- Anal bleeding*
 - most common symptom
- Anal discomfort, pressure or pain
- Anal pruritus, inflammation or irritation
- Anal secretions
- Anal mass or growth
- Changes in bowel movements or habits

***As there might be no symptoms, as symptoms might be non-specific, as prevalence of HPV infection is high, and as incidence of anal cancer is on the rise, periodic screening in higher risk population has been suggested.

Anal Cancer Risk Factors

- Infection with HPV¹
- Age >50
- Anal intercourse/MSM
- Increased number of sexual partners
- Increased exposure to HPV
- Smoking
- Cancer elsewhere
- Anal fistula
- Immunosuppression or HIV
- Patients with HIV: 40 times more probability
- Gender
- Women>Men

Perianal Disease



External Anal Disease
AWE lesions in perianus

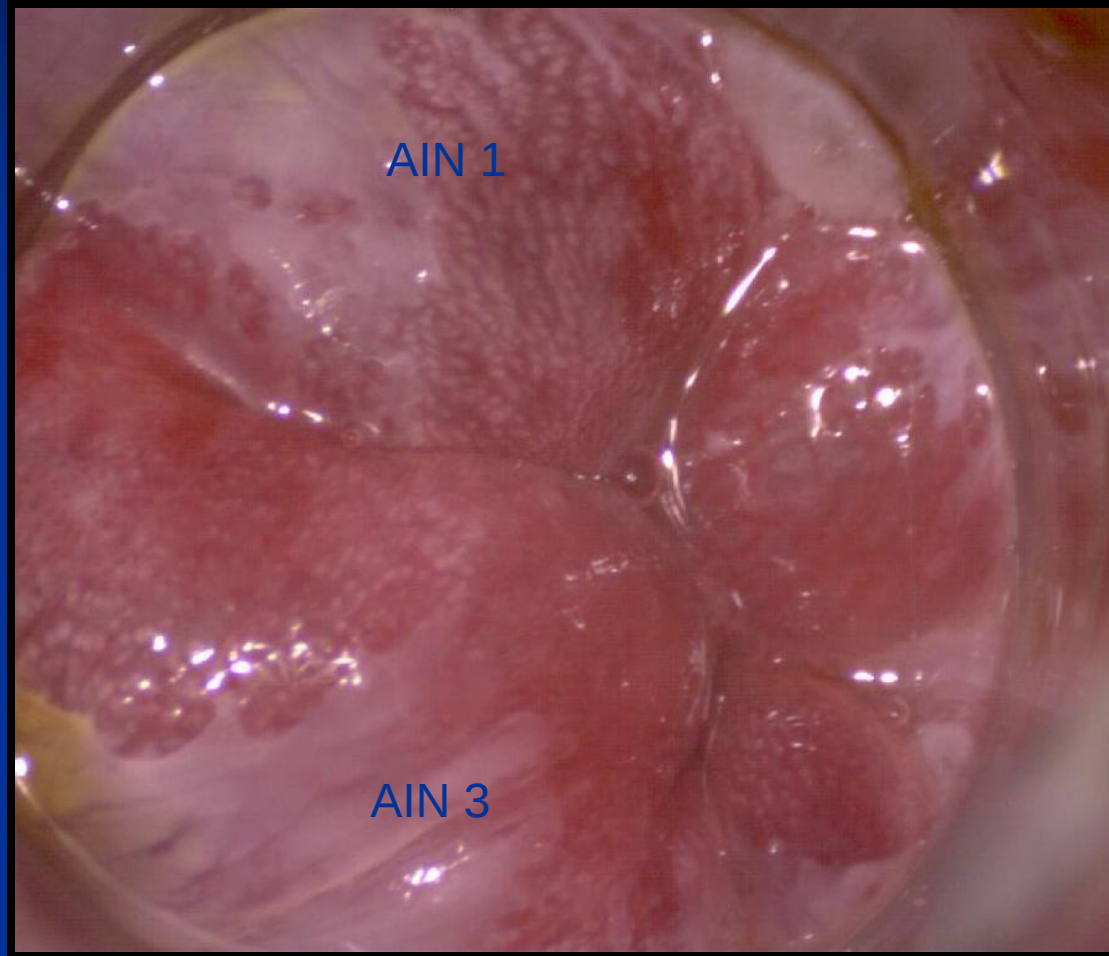


External Anus: Condyloma



Perianal Carcinoma
Well differentiated,
invasive squamous cell
carcinoma.

Anal Neoplasia



Not always easy

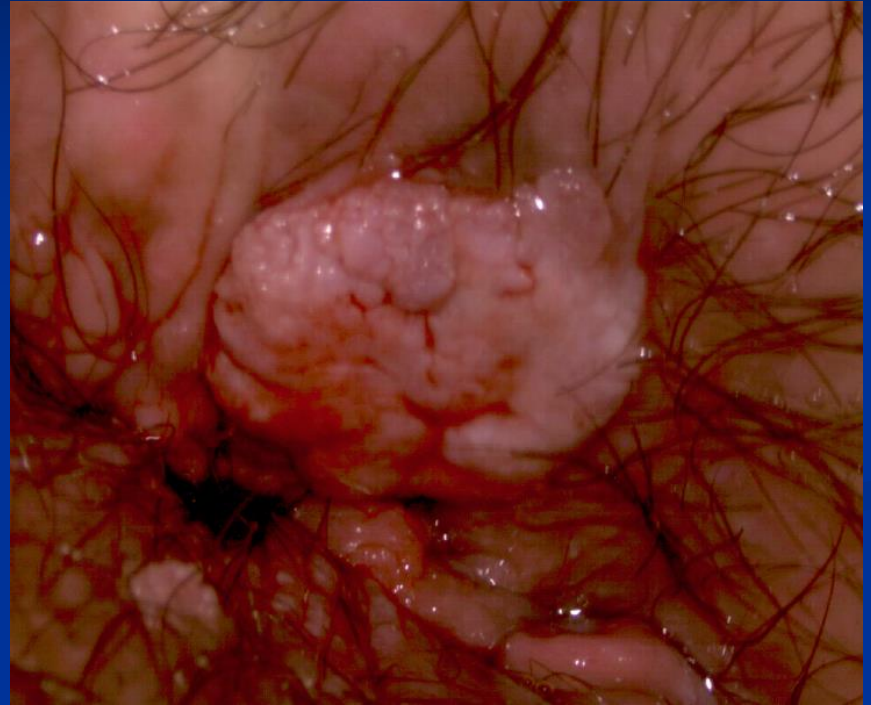
Well-differentiated invasive carcinoma



Perianal Disease



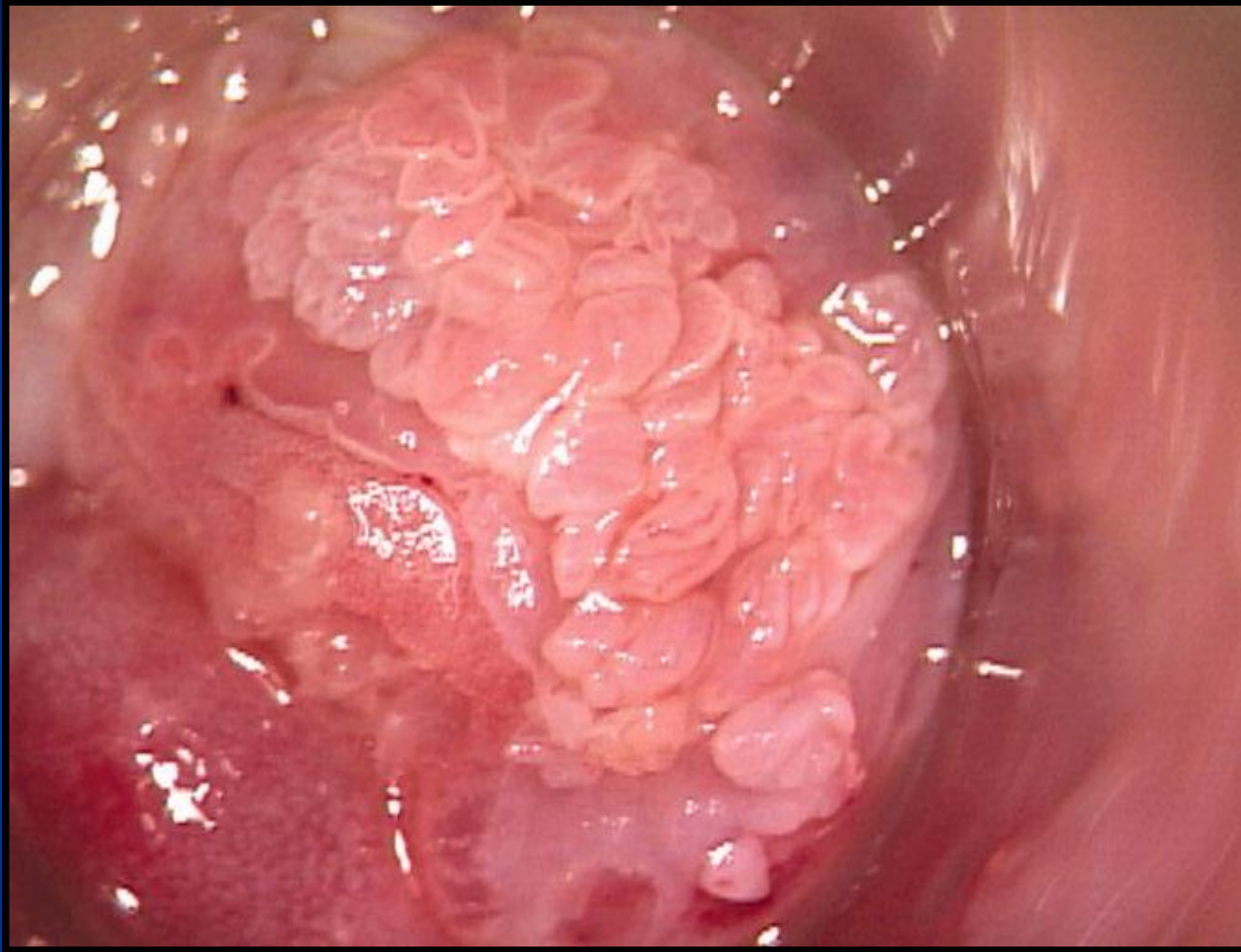
Warts



Condyloma

Physically and emotionally deformant

Warts during HRA



Warts

Screening

- **NO NATIONAL SCREENING GUIDELINES** for anal cancer, but given the similarities with cervical HPV-cervical disease and the increasing incidence of anal cancer in populations at risk, an anal cancer screening protocol has been proposed:
 - Visual inspection
 - Digital rectal examination
 - Anal cytology

Anal Cytology

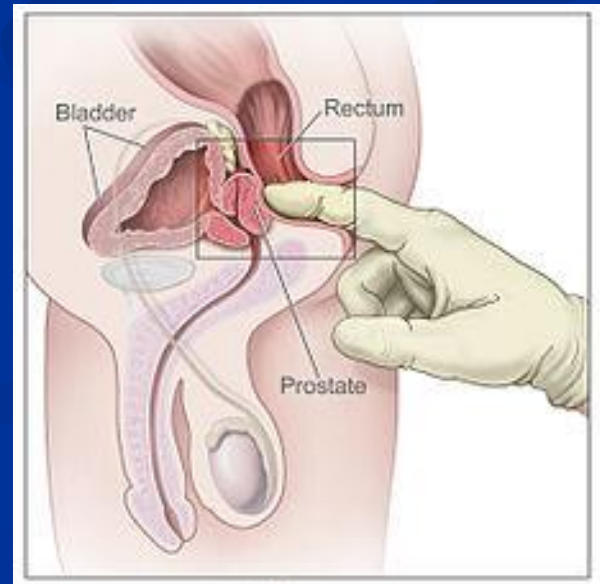
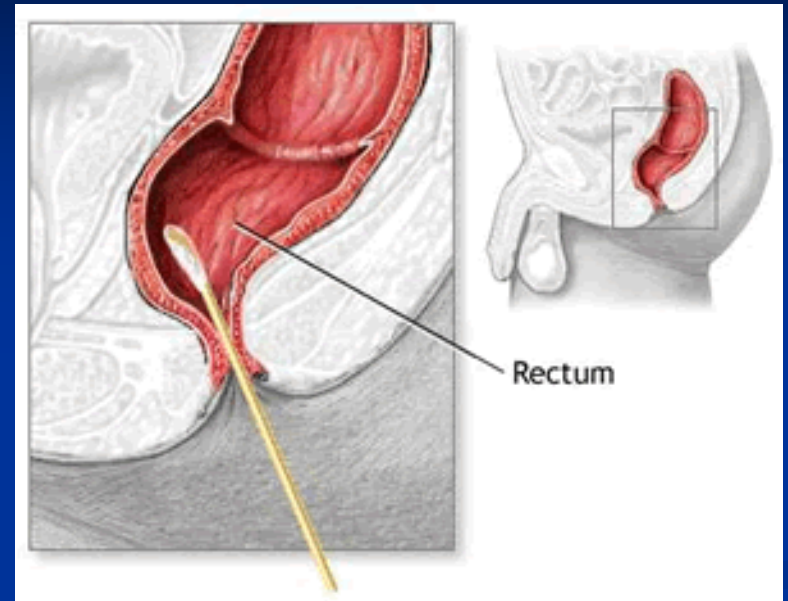
- Based on the experience with the Papanicolaou smear in the prevention of cervical cancer, some authorities have advocated the use of anal cytology in detection of anal neoplasia.
- Cells from the anal canal are collected with a Dacron swab and evaluated microscopically.^{1,2}

1. Anal Cancer Prevention and Screening. The University of Texas MD Anderson Cancer Center Web site.

http://www.mdanderson.org/patient-and-cancer-information/cancer-information/cancer-types/anal_cancer/prevention/index.html.

2. Anal Cancer. American Society of Colon and Rectal Surgeons Web site. http://www.fascrs.org/patients/conditions/anal_cancer/.

Anal Cytology and DRE



High Resolution Anoscopy

- Examination of the anal canal using an anal speculum and a colposcope
 - Usually performed on patients with abnormal anal cytology, anal warts, or higher risk HPV types in anus
 - Acetic acid and iodine tincture are applied to stain tissues and find areas of neoplasia or cancer
 - Small tissue samples (biopsies) can be taken for histopathologic diagnosis

High Resolution Anoscopy





HPV vaccines

- **Two licensed vaccines (safe and effective)**
 - a quadrivalent vaccine (HPV4) for the prevention of cervical, vaginal and vulvar cancers (in females) and genital warts and anal cancer (in females and males)
 - a bivalent vaccine (HPV2) for the prevention of cervical cancers in females.
- Vaccines most effective when given before exposure to HPV through sexual contact.
- Administered intramuscularly.



HPV Vaccine



Quadrivalent/HPV4 (Gardasil)	Name	Bivalent/HPV2 (Cervarix)
Merck	Manufacturer	GlaxoSmithKline
6, 11, 16, 18	Types	16, 18
Females: Anal, cervical, vaginal and vulvar precancer and cancer; Genital warts Males: Anal precancer and cancer; Genital warts	Indications	Females: Cervical precancer and cancer Males: Not approved for use in males
Pregnancy Hypersensitivity to yeast	Contraindications	Pregnancy Hypersensitivity to latex (latex only contained in pre-filled syringes, not single-dose vials)
3 dose series: 0, 2, 6 months	Schedule (IM)	3 dose series: 0, 1, 6 months



The Recommended Immunization Schedules for Persons Aged 0 through 18 Years are approved by the Advisory Committee on Immunization Practices

(<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).

Recommended Immunization Schedule for Persons Aged 7 Through 18 Years—United States • 2010

For those who fall behind or start late, see the schedule below and the catch-up schedule

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years
Tetanus, Diphtheria, Pertussis ¹			Tdap	Tdap
Human Papillomavirus ²	see footnote 2		HPV (3 doses)	HPV series
Meningococcal ³		MCV	MCV	MCV
Influenza ⁴		Influenza (Yearly)		
Pneumococcal ⁵		PPSV		
Hepatitis A ⁶		HepA Series		
Hepatitis B ⁷		Hep B Series		
Inactivated Poliovirus ⁸		IPV Series		
Measles, Mumps, Rubella ⁹		MMR Series		
Varicella ¹⁰		Varicella Series		

 Range of recommended ages for all children except certain high-risk groups
 Range of recommended ages for catch-up immunization
 Range of recommended ages for certain high-risk groups

Accelerating HPV Vaccine Uptake:

Urgency for Action to Prevent Cancer



HPV Vaccines **Prevent Cancers.**

Why Are **So Few** U.S. Adolescents Vaccinated?



A Report to the President of the United States

from

The President's Cancer Panel

Accelerating HPV Vaccine Uptake:

Urgency for Action to Prevent Cancer

A Report to the President of the United States

from

The President's Cancer Panel

Suggested citation: Accelerating HPV Vaccine Uptake: Urgency for Action to Prevent Cancer.
A Report to the President of the United States from the President's Cancer Panel.
Bethesda, MD: National Cancer Institute; 2014.

A Web-based version of this report is available at:
<http://deainfo.nci.nih.gov/advisory/pcp/annualReports/HPV/index.htm>

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Cancer Institute

Figure 10

HPV Vaccine Three-Dose Coverage Among Girls in High-Income Countries

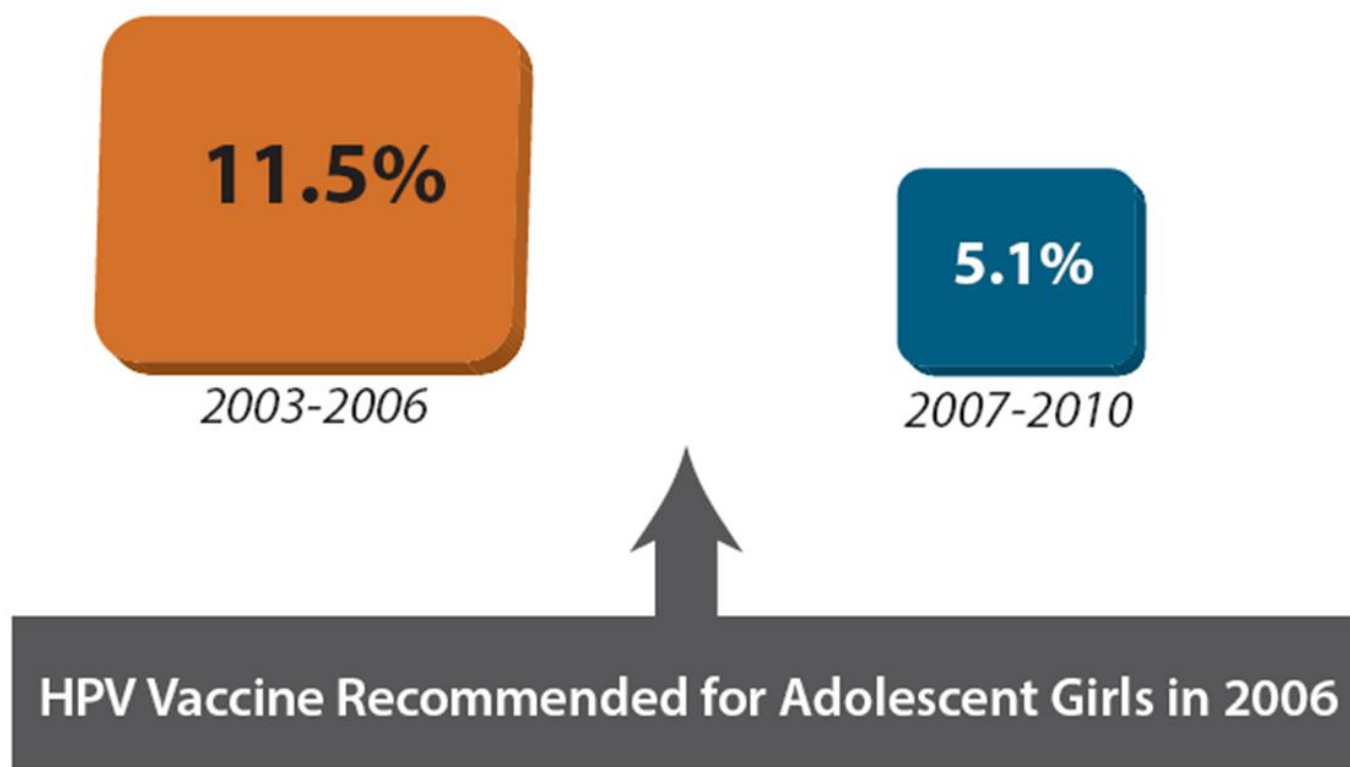


Note: National data on HPV vaccine coverage in Canada are not available. However, Canadian provinces report three-dose coverage among target age groups between 50 and 85 percent.

Sources: Australia (girls turning 15 in 2011): Australian Government Department of Health and Ageing. Human papillomavirus (HPV) [Internet]. Woden (AU): the Department; [updated 2013 Feb 14; cited 2013 Aug 16]. Available from: <http://www.health.gov.au/internet/immunise/publishing.nsf/Content/immunise-hpv>; United Kingdom (12- to 19-year-old girls): Sheridan A, White J. Annual HPV vaccine coverage in England in 2009/2010. London (UK): Health Protection Agency, UK; 2010 Dec 22. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215800/dh_123826.pdf; United States (13- to 17-year-old girls): Centers for Disease Control and Prevention. Human papillomavirus vaccination coverage among adolescent girls, 2007-2012, and postlicensure vaccine safety monitoring, 2006-2013—United States. MMWR. 2013;62(29):591-5; Canada: Saraiya M, Steben M, Watson M, Markowitz L. Evolution of cervical cancer screening and prevention in United States and Canada: implications for public health practitioners and clinicians. Prev Med. 2013;57(5):426-33.

Figure 3

Decline in Prevalence of HPV6, 11, 16, and 18 Among U.S. Girls Ages 14 to 19 Following HPV Vaccine Introduction

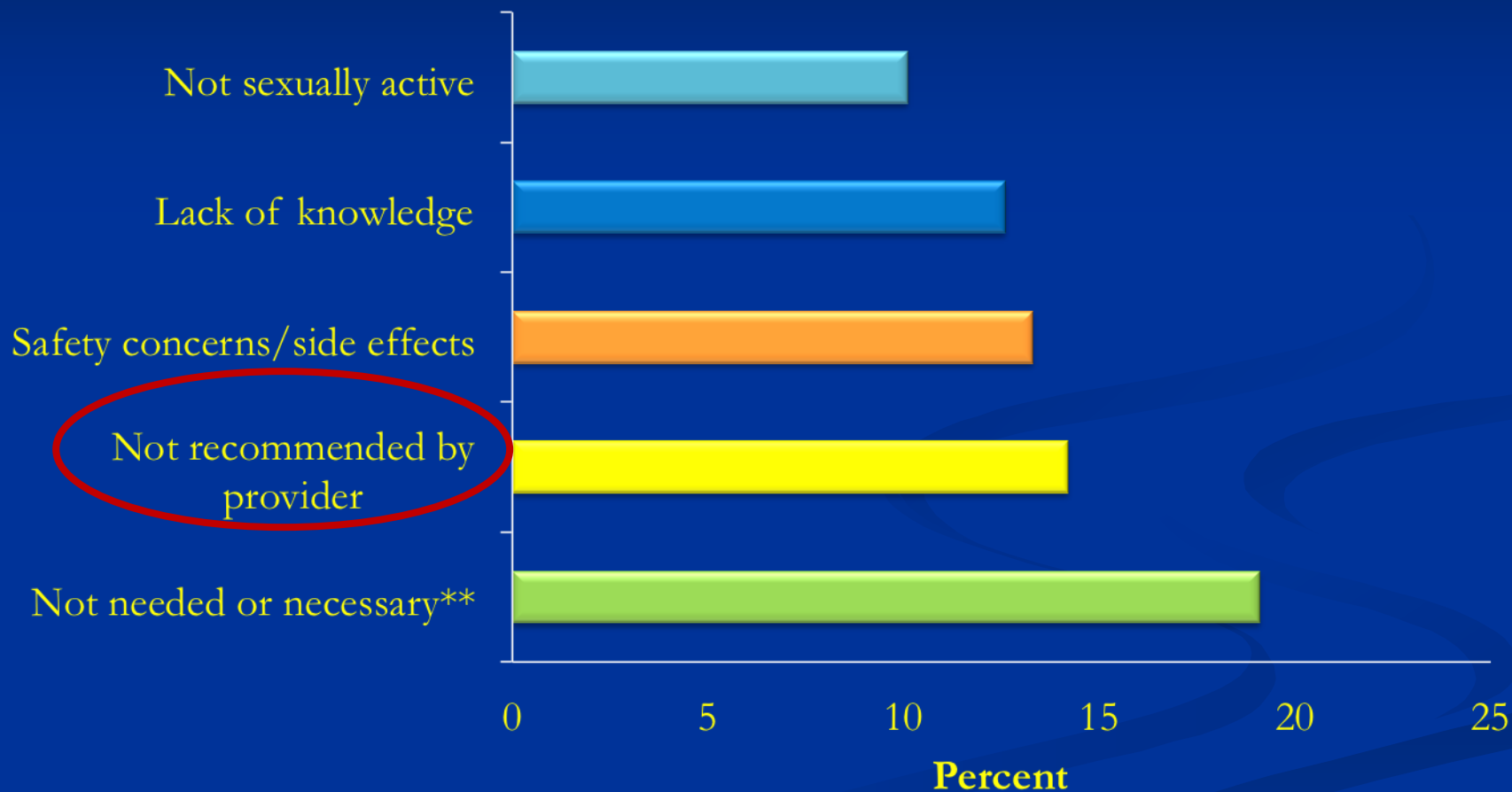


Source: Markowitz LE, Hariri S, Lin C, Dunne EF, Steinau M, McQuillan G, et al. Reduction in human papillomavirus (HPV) prevalence among young women following HPV vaccine introduction in the United States, National Health and Nutrition Examination Surveys, 2003-2010. J Infect Dis. 2013;208(3):385-93.

Accelerating HPV Vaccine Uptake

- Goal 1: Reduce missed opportunities to recommend and administer HPV vaccines
- Goal 2: Increase parents', caregivers' and adolescents' acceptance of HPV vaccines
- Goal 3: Maximize access to HPV Vaccination services

Top 5 reasons for not vaccinating daughter, among parents with no intention to vaccinate in the next 12 months, NIS-Teen 2012



* Not mutually exclusive.

** Did not know much about HPV or HPV vaccine.



General Tips

Tell parents that almost everyone gets HPV and HPV can cause a variety of cancers in women and men

Remind parents that
HPV vaccine is for cancer prevention

Provide a strong recommendation for HPV vaccine
when patients are 11 or 12 years old

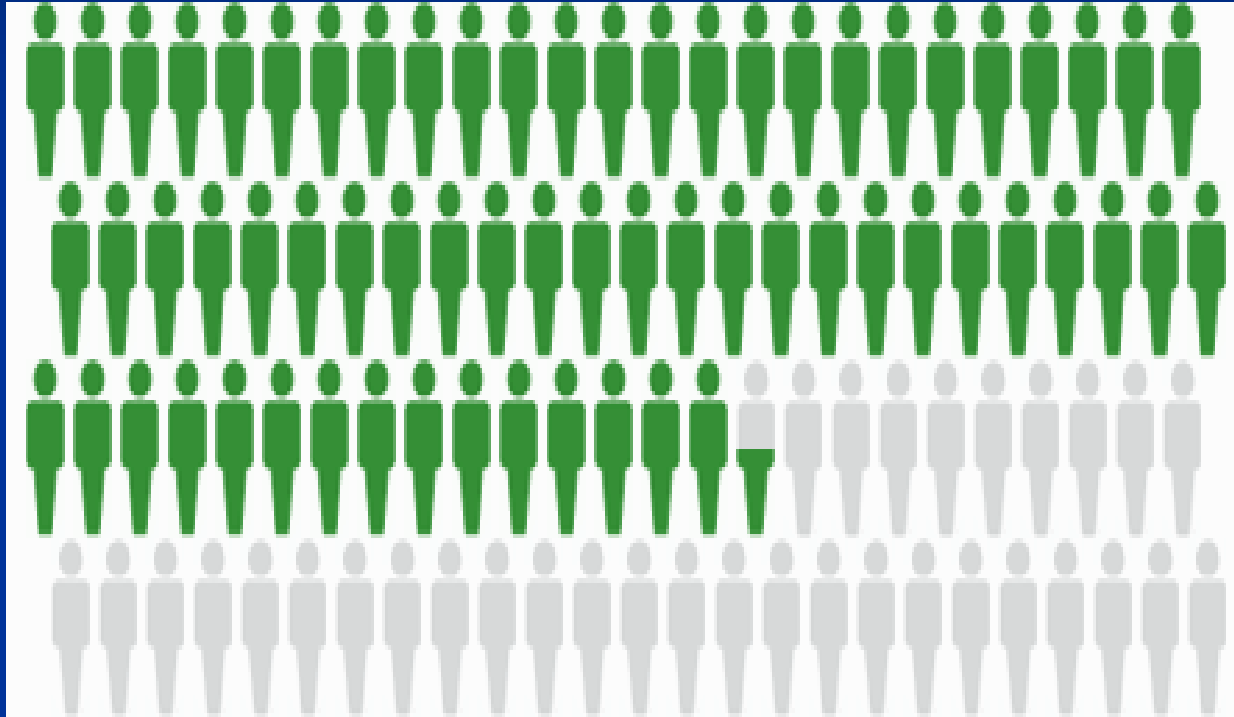
Listen carefully to and welcome patient and parent
questions especially about safety



Anal Cancer in the US

- It was estimated that during the year 2012, 6,230 patients were diagnosed with anal cancer in the USA.¹
- From 1975 to 2009 there has been a significant increment in the incidence of anal cancer ¹
 - 2.2% trend in men and women

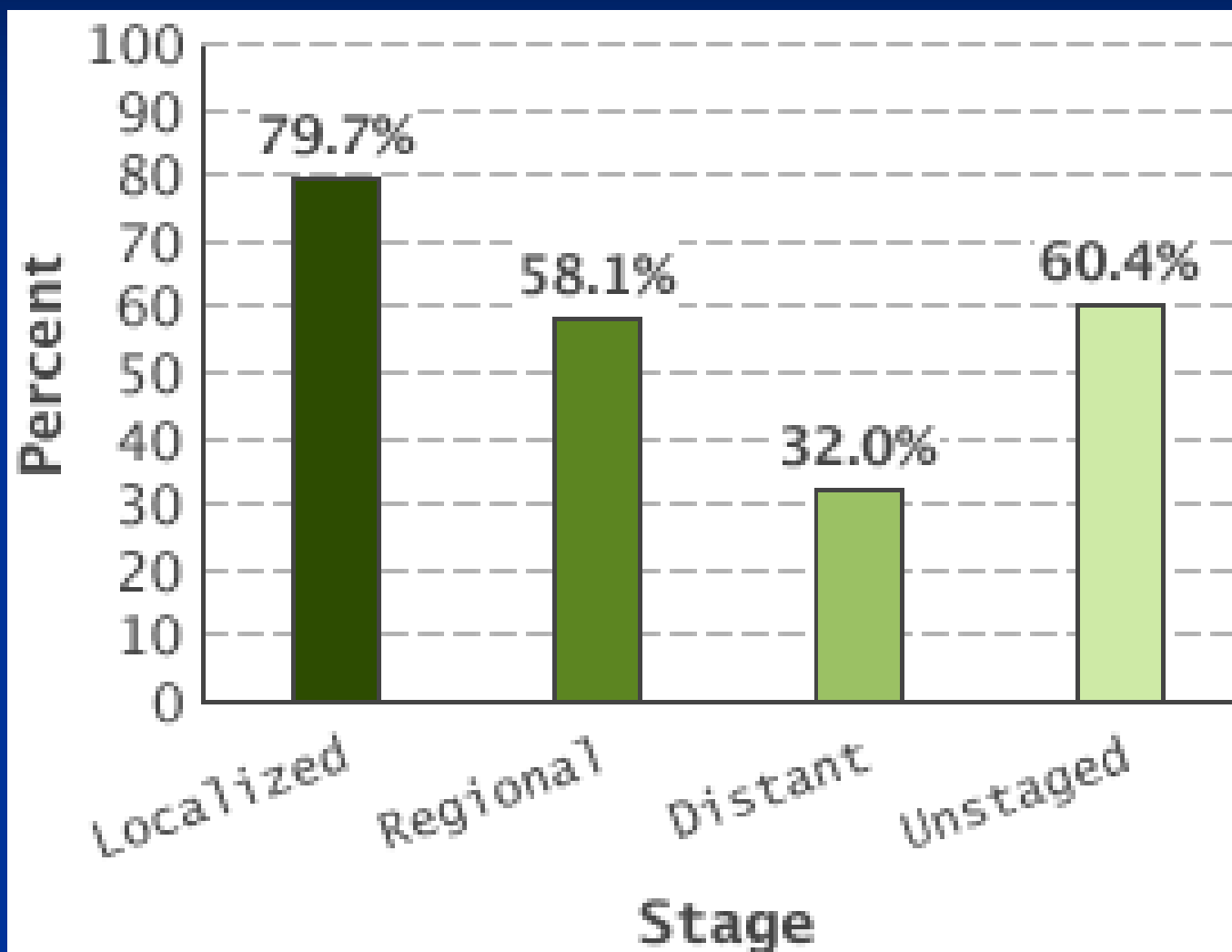
Anal Cancer Survival in the US



**Percent
Surviving
5 Years:
65.5%**

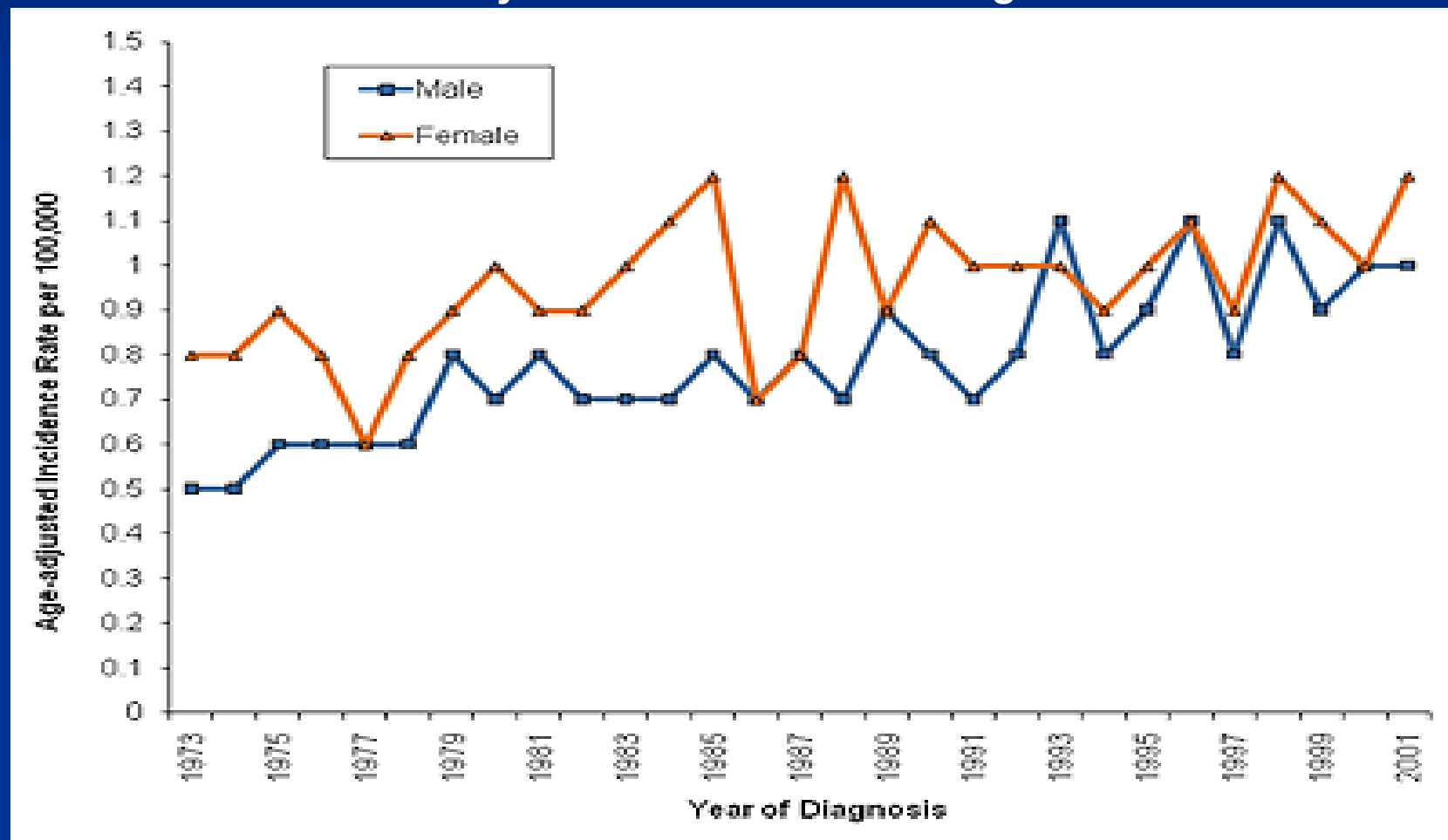
Based on data from SEER 18 2004-2010. Gray figures represent those who have died from anal cancer. Green figures represent those who have survived 5 years or more.

5-Year Relative Survival in the US



Anal Cancer in the US

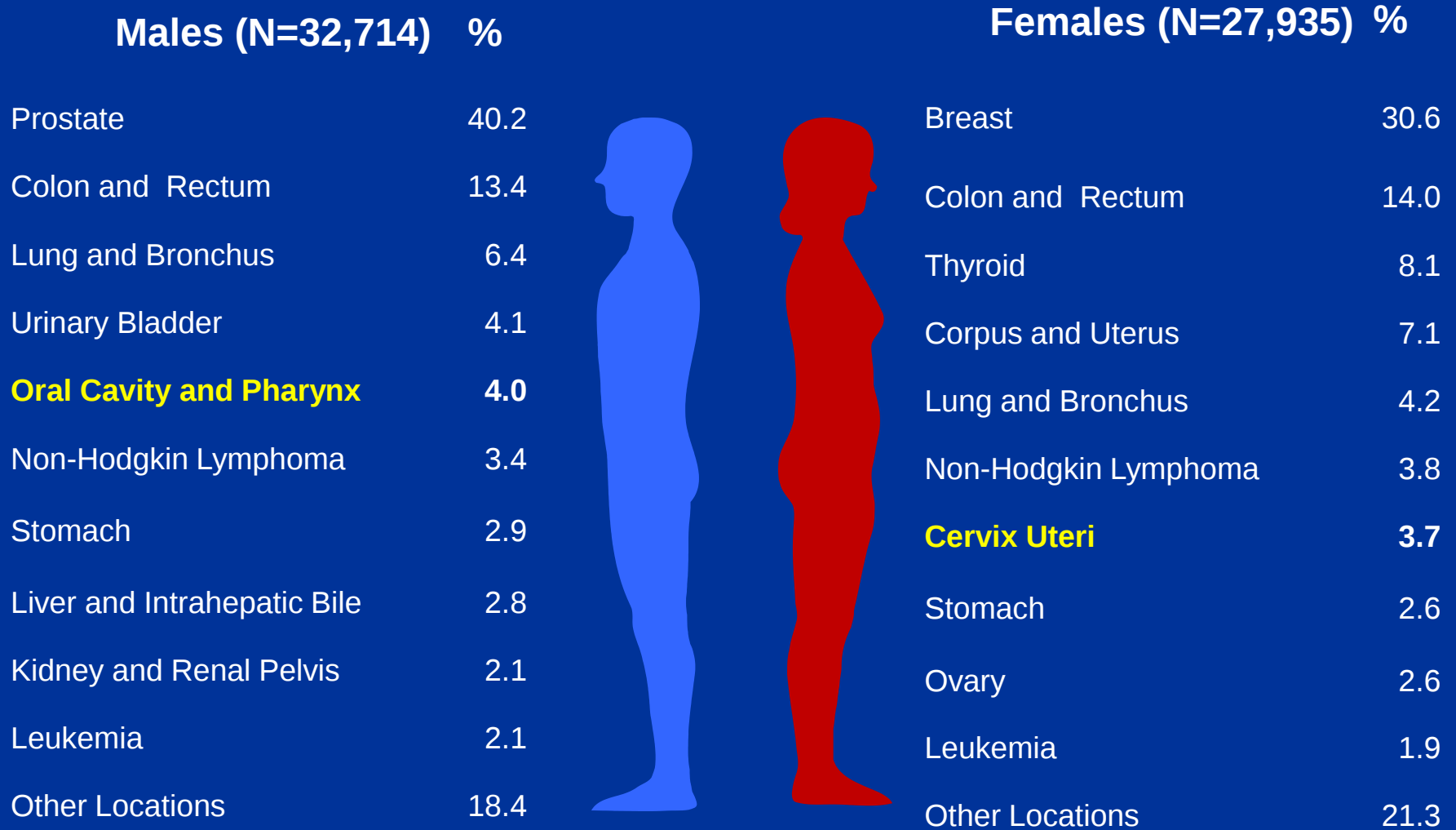
Age-adjusted Incidence Rate of Primary, Malignant Anal Cancer by Gender and Year of Diagnosis



Puerto Rico



Top Ten Incidence Cancer Sites, 2005-2009*



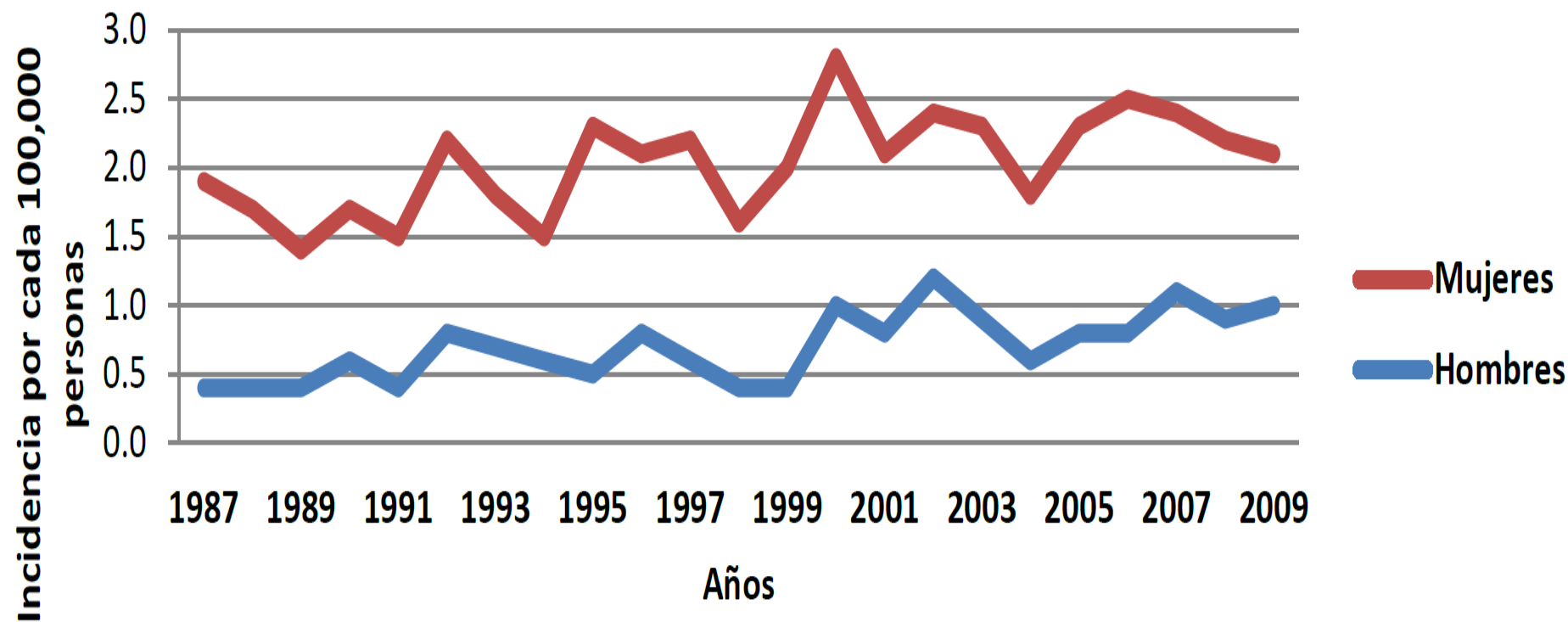
*Statistics are from an average of the years 2005-2009/statistics that presents the year 2009 are preliminary.

Cases with age unknown were included/ Statistics were generated from malignant cases only

Rates are per 100,000 and age-adjusted to the 2000 PR population

Data Source: Puerto Rico Central Cancer Registry, Preliminary Puerto Rico Cancer Incidence File (December, 2011)

Incidencia de Cáncer de Ano en Hombres y Mujeres en Puerto Rico: 1987-2009



Gráfica #5. Incidencia de cáncer de ano por sexo en Puerto Rico.

Anal Cancer Trends in Puerto Rico

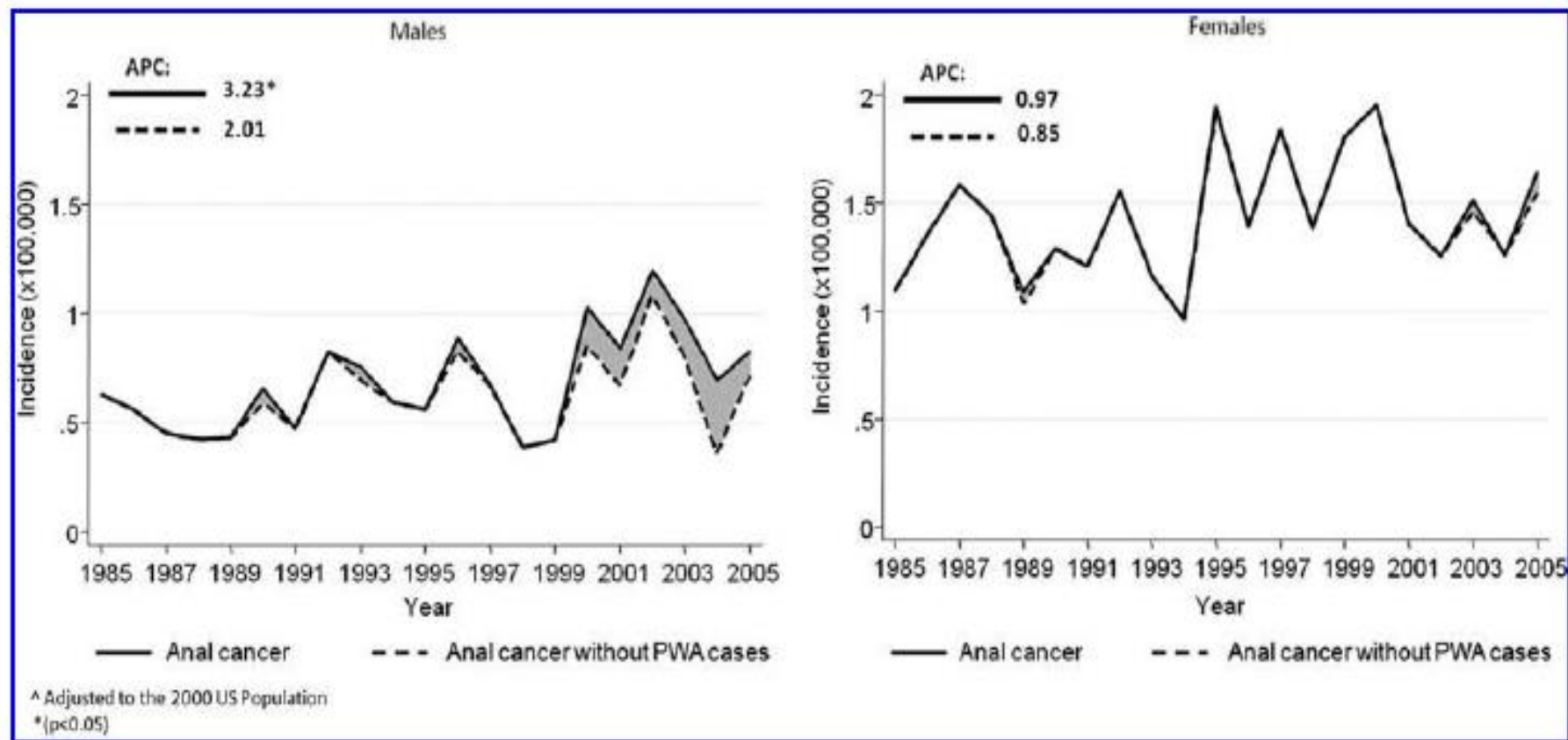


FIG. 1. Age-adjusted incidence rates of anal cancer in Puerto Rico, 1985–2005. Adjusted to the US population; $p < 0.05$.

Ortiz AP, Ortiz-Ortiz KJ, Traverso-Ortiz M, Ríos MY, Colón-López V, Palefsky JM. Anal cancer trends in puerto rico from 1985 to 2005: the potential impact of the AIDS epidemic. *AIDS Patient Care STDS*. 2014 Apr;28(4):165-7. doi: 10.1089/apc.2013.0365. Epub 2014 Mar 24.

Incidence and Standardized Incidence Ratio (SIR) of Cancer Among People Living with AIDS in Puerto Rico

Cancer type	1985–1995		1996–2005		1985–2005		1985–2005 (Based on HPV-Related Histologies ^b)	
	Incidence (per 100,000)	SIR (95% CI)	Incidence (per 100,000)	SIR (95% CI)	Incidence (per 100,000)	SIR (95% CI)	Incidence (per 100,000)	SIR (95% CI)
Overall	5,907.4	16.3 (14.9–17.8)	3142.0	8.7 (7.7–9.7)	4,501.9	12.4 (11.5–13.3)	4,512.8	12.3 (11.5–13.3)
Non-HPV-related	5,613.9	17.2 (15.6–18.8)	2750.7	8.4 (7.4–9.6)	4,153.9	12.7 (11.7–13.7)	4,293.2	12.4 (11.5–13.3)
HPV-related	304.9	13.0 (9.0–18.2)	350.6	15.0 (10.5–20.6)	327.1	13.8 (10.8–17.6)	228.9	11.8 (8.8–15.6)
Women								
Cervix	220.5	18.2 (7.9–35.9)	370.5	30.7 (17.1–50.5)	299.6	24.7 (15.7–37.1)	66.5	5.8 (3.7–8.8)
Vulva/vagina	79.1	22.6 (0.6–126.0)	52.8	15.1 (0.38–84.2)	63.3	18.2 (2.2–65.4)	—	—
Oral cavity/oro-pharynx	67.4	12.5 (0.32–69.9)	47.8	8.9 (0.22–49.6)	55.9	10.4 (1.26–37.6)	—	—
Anus	91.8	47.7 (1.2–265.6)	107.4	55.8 (6.8–201.5)	101.7	52.8 (10.9–154.3)	98.8	62.7 (12.9–183.1)
Men								
Penis	0	0 (0–17.3)	29.9	9.7 (1.2–35.1)	14.7	4.8 (0.6–17.3)	11.3	4.0 (0.5–14.4)
Oral cavity/oro-pharynx	156.1	7.9 (3.9–14.0)	143.9	7.2 (3.47–13.3)	150.0	7.6 (4.7–11.6)	50.5	3.1 (1.3–6.5)
Anus	124.0	107.2 (55.4–187.3)	72.7	62.3 (23.1–136.9)	100.4	86.8 (51.5–137.2)	74.4	125.8 (71.9–204.4)

*Those diagnosed with a non-HPV-related cancer have 2-fold higher risk of death than those with no cancer.

Colon-Lopez V1, Ortiz AP, Soto-Salgado M, Torres-Cintrón M, Perez N, Mercado-Acosta JJ, Guiot HM, Suarez E. Survival from anal cancer among Hispanics-Puerto Rico, 2000-2007. J Gastrointest Cancer. 2014 Jun;45(2):234-8.

PURPOSE: The incidence of anal cancer is increasing, particularly among HIV and men who have sex with men (MSM) groups. The vast majority of cases are associated with human papillomavirus (HPV), the most common sexually transmitted infection. Epidemiological studies have also documented low survival, which might be linked to lack of appropriate screening, access, and utilization of pertinent health care services. Our objective was to assess the relative survival (1 and 3 years) of anal cancer in Puerto Rico for men and women during the period from 2000-2007. **METHODS:** All histological types of cancer of anus, anal canal, and anorectum (ICD-O-3 codes C210-C218), except for sarcomas, were included. Relative survival was estimated with the use of life tables from the population of Puerto Rico. In addition, the excess survival was compared by age at diagnosis, histology, and stage (defined as local, regional, or distant), using the Poisson regression model. **RESULTS:** The overall 3-year relative survival in Puerto Rico was the same (53 %) for men and women. **CONCLUSIONS:** Our findings establish baseline survival data for anal cancer in Hispanics from Puerto Rico. Since now, the national guidelines for anal cancer screening and treatment are on their way to be determined; baseline information about survival will allow monitoring the efficacy that standardized screening programs may eventually have in increasing anal cancer survival in this population.

Anal cancer burden in PR:

Overview

- Increasing trends of anal cancer (PRCCR, 2012).
- The overall 3-year relative survival in Puerto Rico was the same (53 %) for men and women (2000-2007)(Colón, 2014).
- The risk of anal cancer is higher in PHLA than in the general population (1985-2005) (Ortiz, 2014).
 - Men: SIR = 86.8; 95% CI, 51.5–137.2
 - Women: SIR = 52.8; 95% CI, 10.9–154.3

HPV Vaccine Coverage in Puerto Rico

Total Población con HPV de 13 a 15 años de Edad por Sexo

Hasta 10 de Enero de 2014

	Femenino	%	Masculino	%	Desconocidos	%	Total	%
Población	90,327	51	85,804	48	2,515	1	178,646	
1 Dosis	45,920	51	38,956	45	645	26	87,391	49
2 Dosis	29,209	32	22,343	26	261	10	51,813	29
3 Dosis	18,119	20	12,822	15	144	6	31,085	17

Total Población con HPV de 11 a 18 años de Edad por Sexo

Hasta 10 de Enero de 2014

	Femenino	%	Masculino	%	Desconocido	%	Total	%
Población	227,033	48	236,909	50	6,202	2	470,144	
1 Dosis	115,286	51	89,687	38	1,451	23	206,424	44
2 Dosis	74,859	33	48,888	21	664	11	124,411	27
3 Dosis	48,130	21	26,496	11	380	6	75,006	16

*Esta información fue obtenida del Registro de Inmunización de Puerto Rico (PRIR) en 01/10/2014 *

***Healthy People 2020 Goal:
80% of 13- to 15-year-old girls fully vaccinated.**

**What have we learned from research
studies in Puerto Rico?**

Population-based study of HPV infection among women in the San Juan Metropolitan Area of Puerto Rico

■ Study design and population:

- Cross-sectional study (2010-2013)
- Study sample is being identified through a complex sampling design of households in the San Juan Metropolitan Area (SJMA), composed of seven municipalities, and includes non-institutionalized women aged 16-64 years old residing in this area.
- N=566 women (response rate of 83.4%).

Population-based study of HPV infection among women in the SJMA of Puerto Rico

Figure 1. San Juan Metropolitan Area

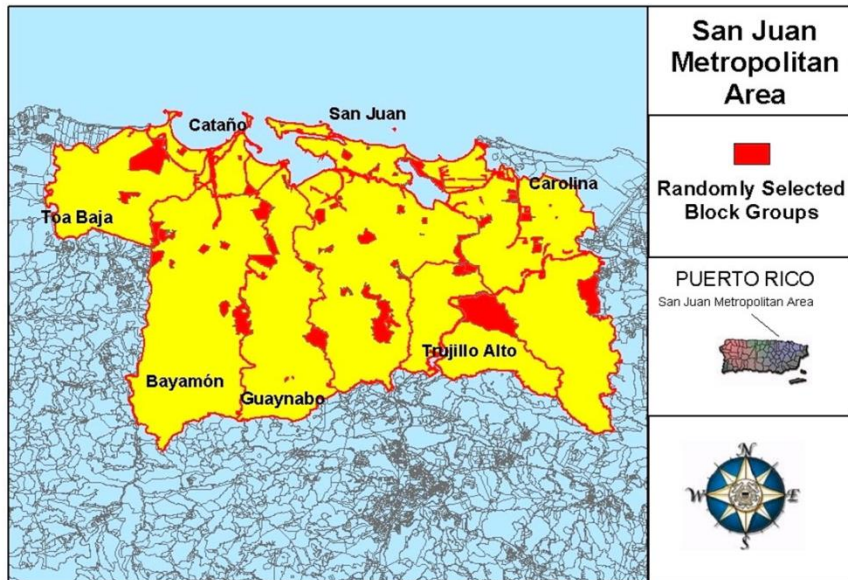
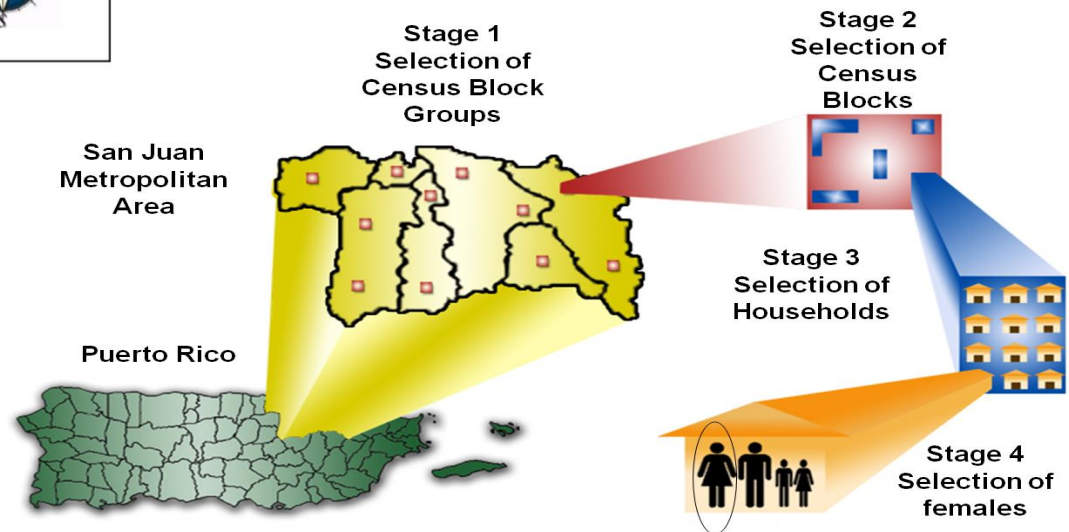


Figure 2. Sampling scheme



Instructions for self-collection

Instrucciones para el auto-examen anal del Virus de Papiloma Humano (VPH)

Cuello uterino (cervix) Uretra Vagina con cepillo (vagina) Palillo algodónado Ano	1. Relájese y lávese las manos. 2. Póngase de pie con las piernas abiertas y ligeramente flexionadas (en cuclillas) o bien apoyando un pie en una superficie sobre-elevada (inodoro, bañera o taburete). 3. Humedezca la parte algodónada del palillo con agua estéril. 4. Coloque el palillo en la entrada del ano, y ejerciendo un poco de presión, introduzca la parte algodónada por lo menos una (1) pulgada en el canal anal.
	5. Suavemente rote el palillo aplicando un poco de presión sobre las paredes del canal anal, realizando un movimiento en espiral durante aproximadamente diez (10) segundos.
	6. Saque el palillo por completo. Destape el envase que se le entregó. Tenga cuidado con el líquido que hay dentro del envase. Coloque el palillo dentro del envase con la parte algodónada del palillo primero, procurando que no roce con nada alrededor. Rompa el palillo contra el borde del envase (solamente tiene que doblarlo y se partirá) para que éste quede dentro del envase y cierre el mismo. 7. Entréguele el envase a la entrevistadora.

Referencia: Female Swab Specimen Collection Kit, DIGENE Corporation, Gaithersburg, MD

Instrucciones para el auto-examen vaginal del Virus de Papiloma Humano (VPH)

Cervix Uterus Labios menores Labios mayores Vagina con cepillo (vagina) Palillo algodónado Ano	1. Relájese y lávese las manos. 2. Póngase de pie con las piernas abiertas y ligeramente flexionadas (en cuclillas) o bien apoyando un pie en una superficie sobre-elevada (inodoro, bañera o taburete). 3. Humedezca el cepillo con agua estéril. 4. Coloque el cepillo en la vagina a la vez que mantiene los labios de la vulva abiertos. Trate de colocar el cepillo directamente dentro de la vagina sin que toquen nada de sus genitales.
Cuello uterino (cervix) Uretra Vagina con cepillo (vagina) Palillo algodónado Ano	5. Inserte el cepillo dentro de la vagina lo más que pueda, sin soltar su parte inferior (como si fuera un tampón). 6. Saque el cepillo un poco (hasta la mitad de la vagina aproximadamente) y vuélvalo a introducir hasta el fondo. Mueva el cepillo hacia arriba y hacia abajo cinco (5) veces, trate de apuntar al cuello de la cervix (cuello del útero, al fondo de la vagina).
	7. Al llegar al cervix, rote el cepillo tres (3) veces.
	8. Saque el cepillo por completo. Destape el envase que se le entregó. Tenga cuidado con el líquido que hay dentro del envase. Coloque el palillo dentro del envase con el cepillo primero, procurando que no roce con nada alrededor. Rompa el palillo contra el borde del envase (solamente tiene que doblarlo y se partirá) para que éste quede dentro del envase y cierre el mismo. 9. Entréguele el envase a la entrevistadora.

Referencia: DNA Collection Device, DIGENE Corporation, DIGENE Corporation, Gaithersburg, MD

Instrucciones para el auto-examen oral del Virus del Papiloma Humano (VPH)

Vamos a pedirle que haga un enjuague bucal con el enjuagador bucal "Scope", y luego que escupa el enjuagador bucal en un envase, con el objetivo de hacer una prueba para identificar la presencia de un virus que algunas personas tienen en su boca llamado Virus del Papiloma Humano (VPH).

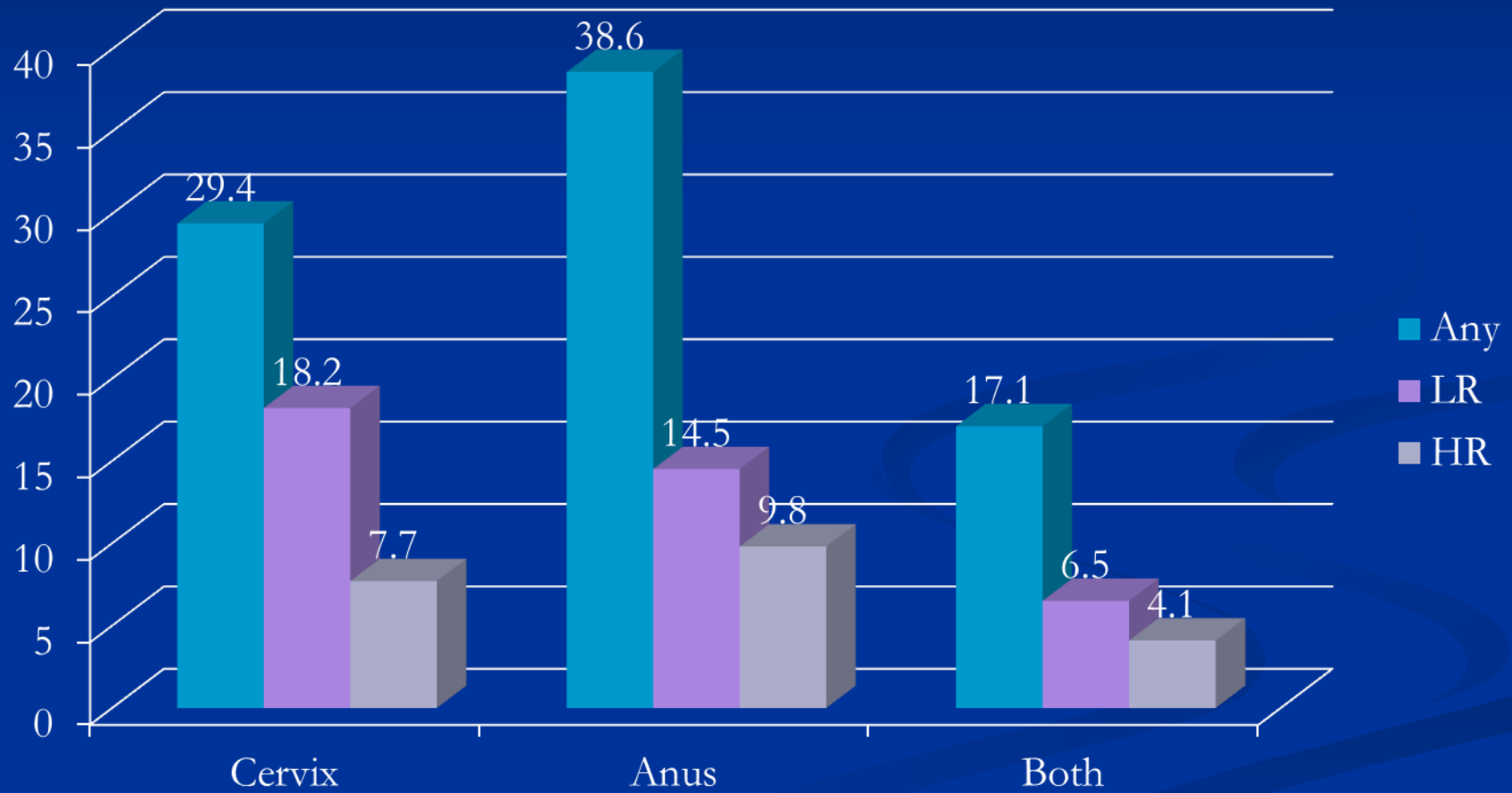
Primero, enjuagará su boca con el enjuague bucal por cinco (5) segundos y luego hará gárgaras por 5 segundos. Hará esto tres (3) veces y luego escupirá el enjuagador bucal en un envase. Yo (el entrevistador) le dejaré saber cuándo hacer cada uno de los pasos. ¿Tiene preguntas?

	1. Lávese las manos. 2. Enjuague su boca con aproximadamente 10 ml de enjuagador bucal por cinco (5) segundos y seguido haga gárgaras por cinco (5) segundos adicionales. Repita este proceso 3 veces, siguiendo las guías de tiempo del entrevistador: • Enjuague (5 segundos) • Gárgara (5 segundos) • Enjuague (5 segundos) • Gárgara (5 segundos) • Enjuague (5 segundos) • Gárgara (5 segundos) 3. Escupa el enjuagador bucal en el envase sin que se derrame por el borde del mismo. 4. Cierre el envase inmediatamente. 5. Entréguele el envase a la entrevistadora.
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* En caso de que la boca del participante esté irritada, se hará el procedimiento con agua de sal.

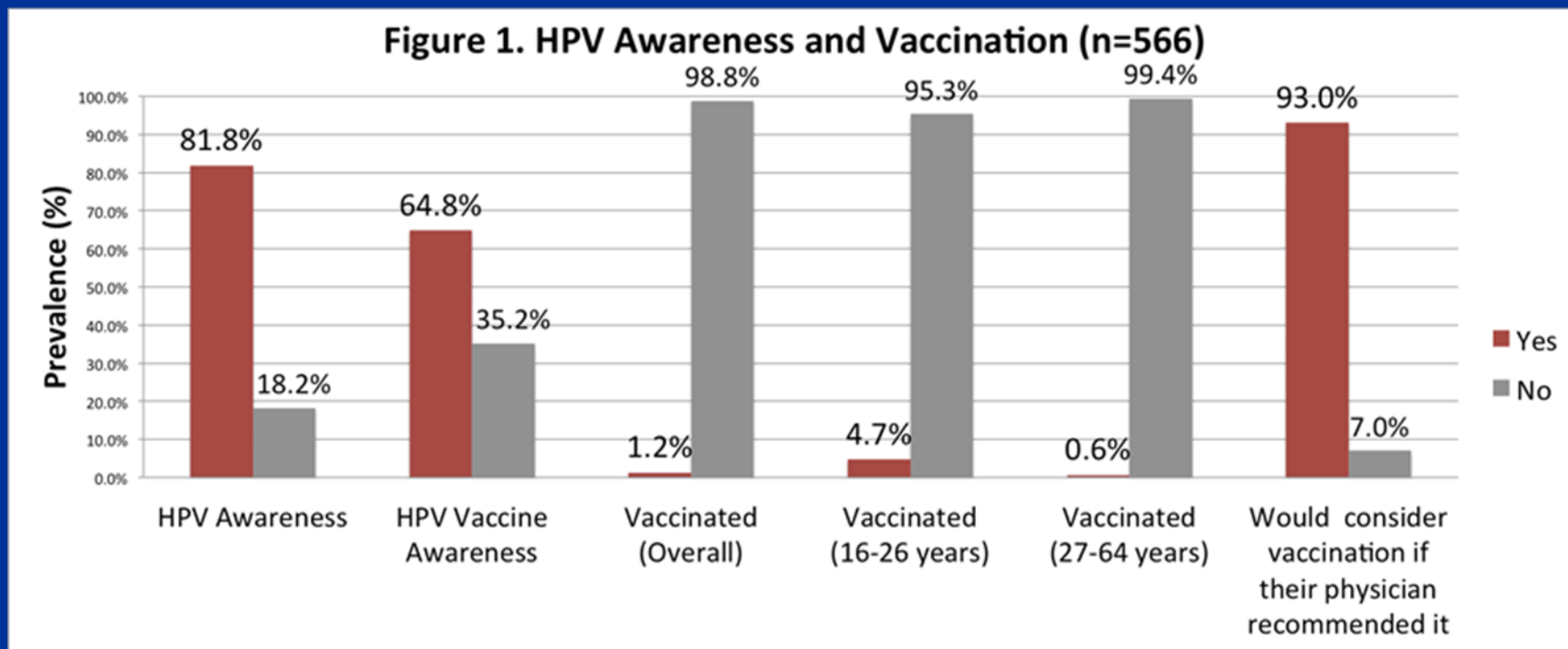
Referencia: HPV Rinse (2009-2010), National Health and Nutrition Examination Survey (NHANES), Center for Disease Control and Prevention, Atlanta, GA

Weighted HPV Prevalence among women aged 16-64 years living in the SJMA of Puerto Rico



Factors Associated to HPV Vaccine Awareness in a Population-Based Sample of Women aged 16-64 in Puerto Rico

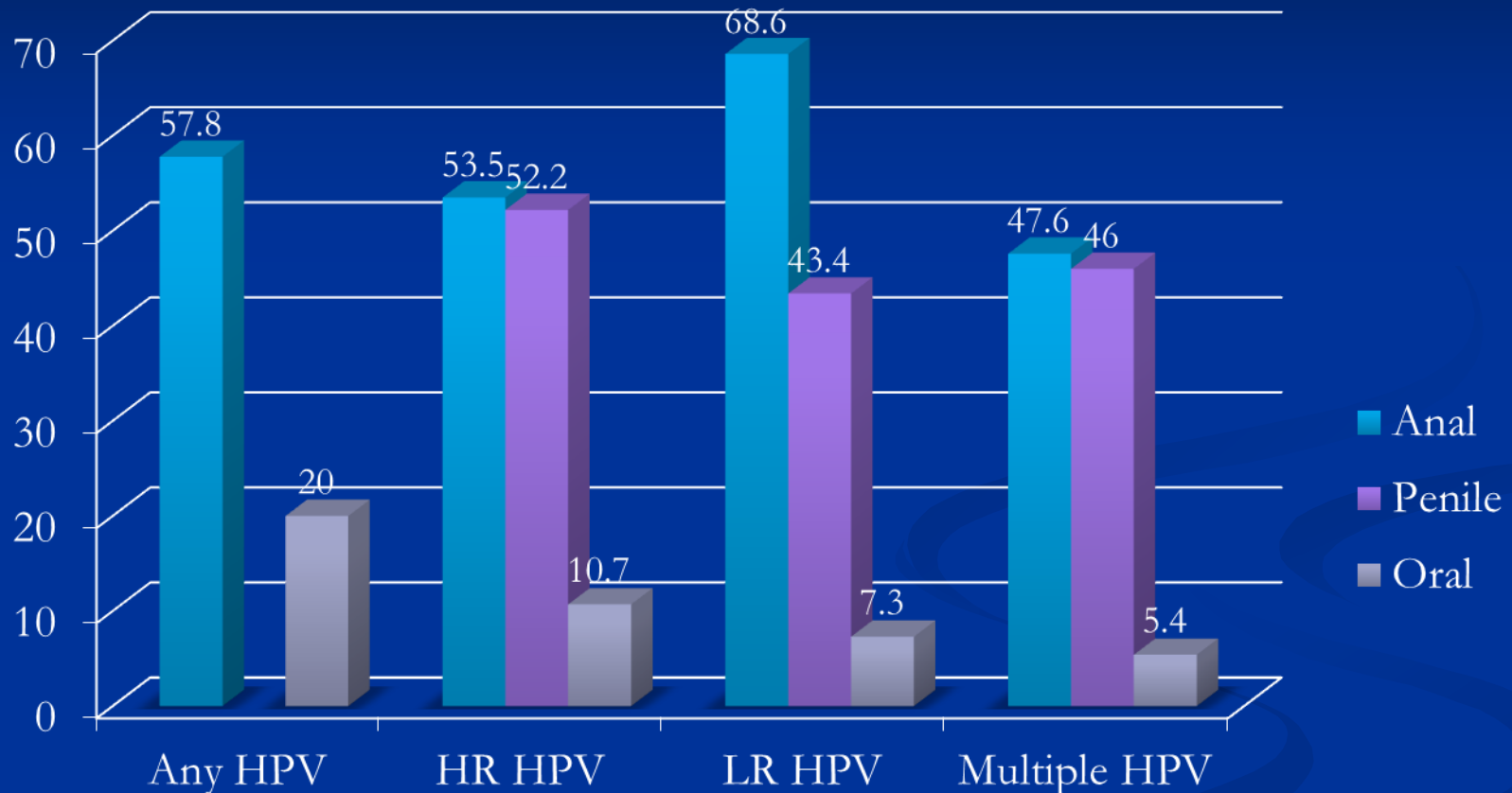
Romaguera J, Caballero-Varona D, Tortolero-Luna G, Marrero E, Pérez CM, Palefsky J, Ortiz AP.



HPV infection in Men



Prevalence of HPV infection among Men Attending an STI Clinic in PR (n=205).



Colón-López V, Ortiz AP, Del Toro-Mejías L, Clatts MC, Palefsky JM. Epidemiology of anal HPV infection in high-risk men attending a sexually transmitted infection clinic in Puerto Rico. PLoS One. 2014 Jan 6;9(1):e83209. doi: 10.1371/journal.pone.0083209. eCollection 2014.

Colon-López V, Quiñones-Avila V, Del Toro-Mejías LM, Reyes K, Rivera ME, Nieves K, Sánchez-Vazquez MM, Martínez-Ferrer M, Ortiz AP. Oral HPV infection in a clinic-based sample of Hispanic men. BMC Oral Health. 2014 Jan 24;14:7. doi: 10.1186/1472-6831-14-7.

Colon-López V; Ortiz AP; Del Toro-Mejías L; García H; Clatts MC; Tortolero G and Palefsky JM. Prevalence and Correlates of Penile HPV infection in a clinic-based sample of Hispanic Men. To be submitted to the Journal of Lower Genital Tract Disease.

Projecting the Potential Public Health Impact of a Quadrivalent HPV Vaccine in Puerto Rico

Source: Ortiz AP, Ortiz-Ortiz K, Pillsbury M, Kothari S, Rios M, Laborde J, 2013.

Methods: Model Description

- The analysis was performed from a health care perspective.
- A previously published transmission dynamic model^[1,2,3] for HPV types 6,11, 16, 18 was adapted to Puerto Rico.
- The model is an age-structured mathematical model that incorporates:
 - Demographic model describing birth, aging, and death.
 - Behavioral model describing sexual mixing patterns.
 - HPV infection and disease models describing transmission and disease occurrence.
- The model captured direct protective effects of vaccination and indirect effects (herd immunity).

1.Impact of vaccinating boys and men against HPV in the United States. Elbasha EH, Dasbach EJ, Vaccine 2010 Oct 4;28(42):6858-67

2.A multi-type HPV transmission model. Elbasha EH, Dasbach EJ, Insinga RP, Bull Math Biol. 2008 Nov;70(8):2126-76.

3.Model for assessing human papillomavirus vaccination strategies. Elbasha EH, Dasbach EJ, Insinga RP, Emerg Infect Dis. 2007 Jan;13(1):28-41

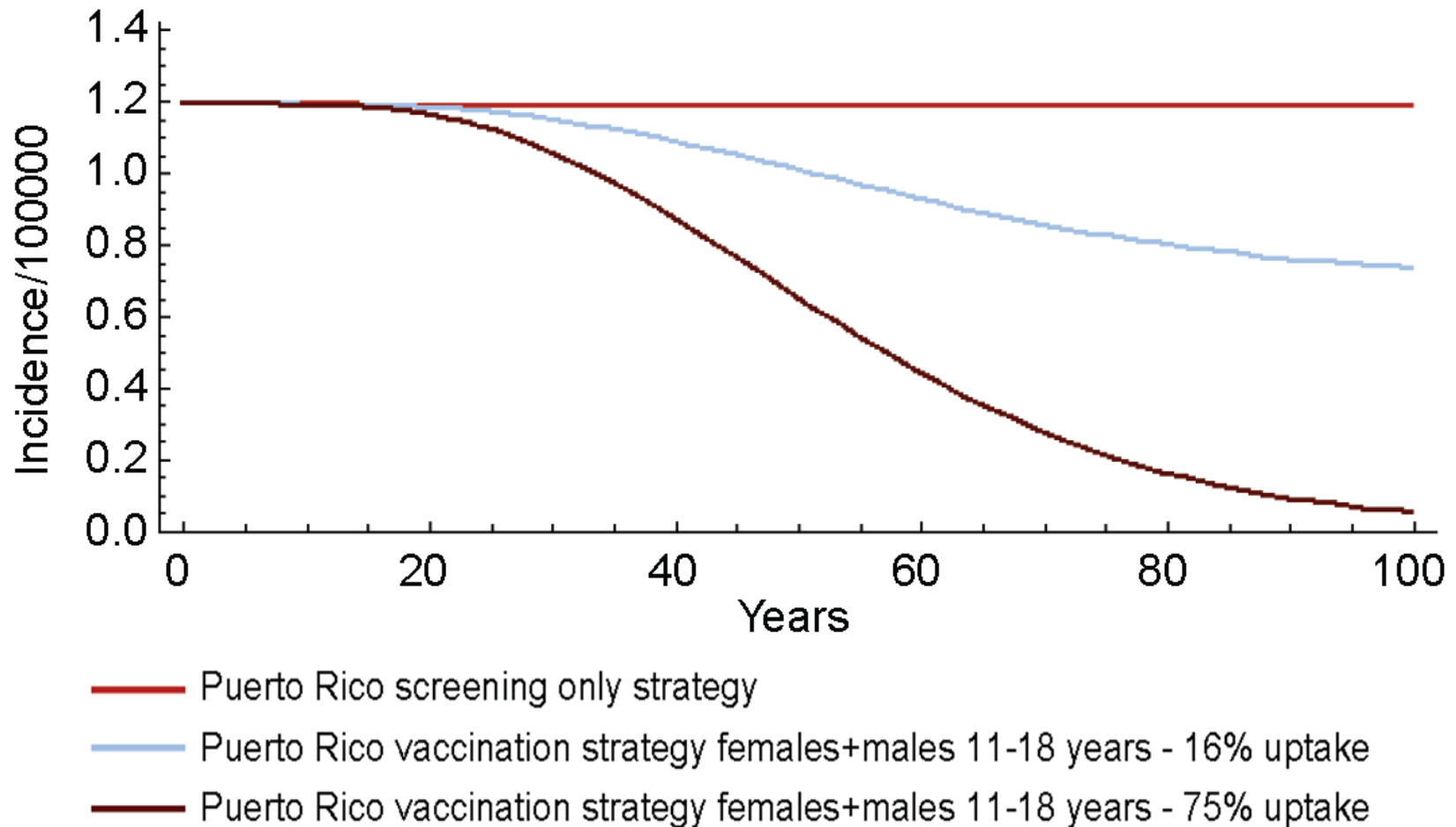
Vaccination Strategy

Ages Vaccinated	Female Uptake	Male Uptake
11-18	16% and 75%	16% and 75%

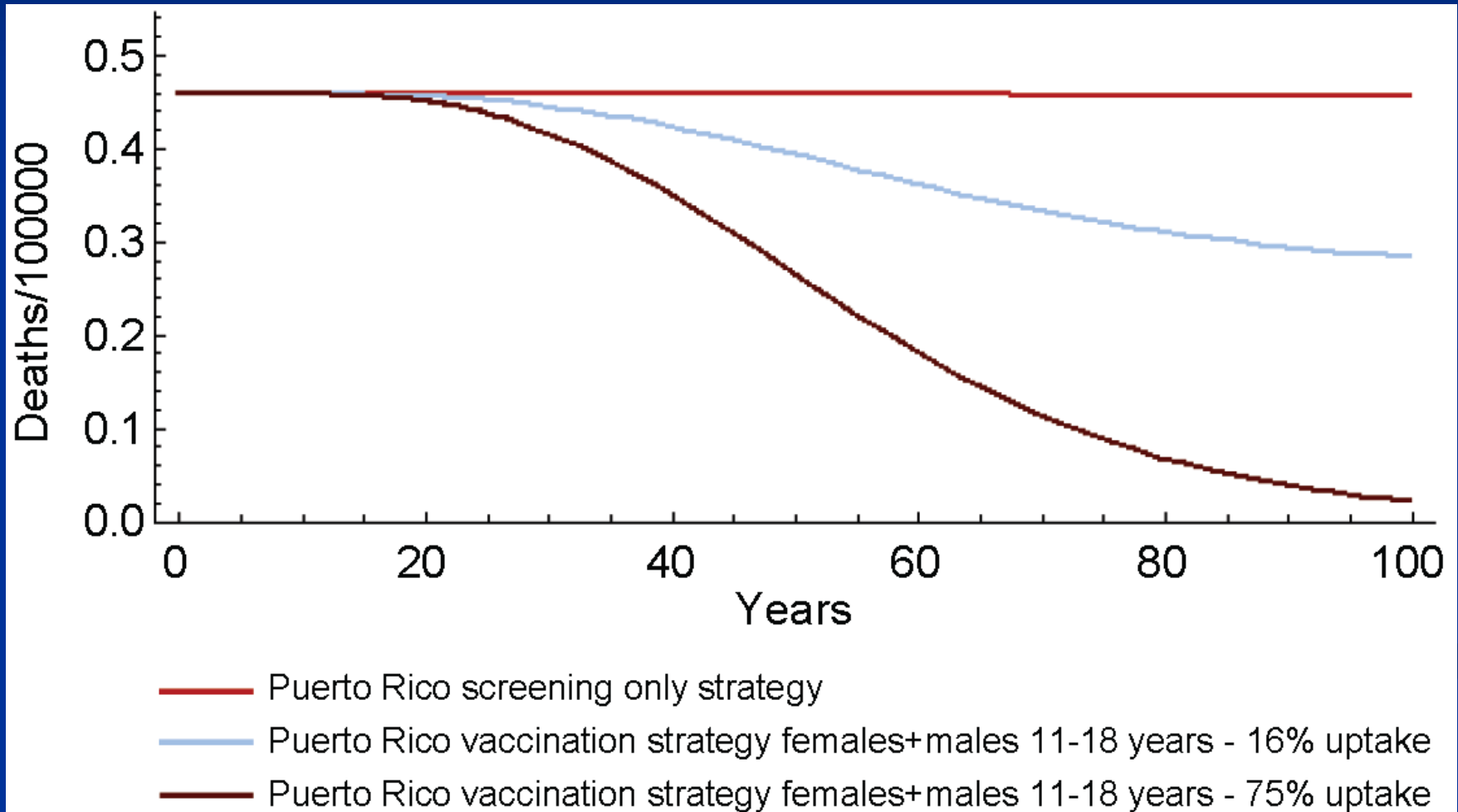
*Assumes administration of all three doses

- Vaccination strategy of girls and boys 11-18 years of age compared to no vaccination strategy.
- Included all HPV related outcomes in women and men.
 - Incidence of Cancer and neoplasia: cervical, vaginal, vulvar, anal, penile, head and neck, CIN, VAIN
 - Incidence of 6,11 diseases: genital warts, Respiratory Papillomatosis (RRP)
 - Cancer related mortality
 - RRP related mortality

Estimated HPV 16/18-Related Incidence of Anal Cancer Among Males Over an 100 Year Period



Estimated HPV 16/18-Related Anal Cancer Deaths Among Males Over an 100 Year Period



Conclusions

- Anal HPV infection is common in our population
- HPV vaccination is important for anal cancer prevention efforts, safe and should be promoted
- Future population-based studies are warranted to further understand disease burden and the impact of vaccination
- Multidisciplinary collaborative approaches should be used for the prevention and control of anal cancer in PR in PR
 - Epidemiologic research
 - Clinical trials
 - Patient and provider education
 - Clinical/System Interventions
 - Policy

Resources

HPV vaccines

- Puerto Rico Cancer Control Coalition: Omayra Salgado: osalgado@cccpr.org
- Programa de Vacunación, Departamento de Salud: 787-765-2929 ext. 3338, 3336



VPH INFORMATE
<http://www.cdc.gov/hpv/>

¿Cómo obtener la vacuna para el Virus del Papiloma Humano (VPH)?

La siguiente información es una guía, que esperamos le sea útil para identificar una clínica de vacunación o proveedor, donde pueda obtener la vacuna contra elVPH para su(s) hija(s), hijo(s) o usted.

NIÑAS, NIÑOS Y JÓVENES DE 11-18 AÑOS:

- Si su plan médico es El Plan del Gobierno de PR (MI Salud) o NO tiene plan médico.
 - o Si tiene MI Salud, el Departamento de Salud provee las vacunas libre de costo, solo se cobra un costo por administración de la vacuna de \$10.00. Para más información, llame al Programa de Vacunación al (787)765-2929 ext. 3338, 3336 ó 3337 o acceda a la siguiente dirección electrónica: www.salud.gov.pr
 - o Si no tiene plan médico, La Red de Centros de Salud Primaria 330 de Puerto Rico administran las vacunas libre de costo. La administración de la vacuna tendrá un costo de \$10 por cada dosis. Para más información acceda a la siguiente dirección electrónica: www.saludprimariapr.org
- Si su plan médico es privado
 - o Verifique si su plan médico cubre la vacuna contra elVPH (Gardasil® y/o Cervarix®) y solicite información sobre proveedores que tengan la vacuna disponible en su área.
 - o Si su plan médico privado cubre la vacuna, comuníquese con su pediatra o ginecólogo y pregunte si tiene disponible la vacuna del VPH.
 - o Los Centros de Salud Esteban Calderón, administran la vacuna a aquellos pacientes que su plan médico cubre el costo de la vacuna. Existen 5 centros en toda la isla: Arecibo (tel. 787-817-1245), Bayamón (tel. 787-787-5151 ext. 2397), Ponce (787-843-3260 ext. 273 ó 246), Mayagüez (tel. 787-833-3085) y Las Piedras (787-733-8969).
- Si su plan médico privado no cubre la vacuna
 - o Llame a servicio al cliente de su plan médico y solicite la certificación de cobertura de la vacuna delVPH.
 - o Acuda a las clínicas de vacunación de La Red de Centros de Salud Primaria 330 de Puerto Rico con la certificación de cobertura para la vacuna contra el VPH. Estos centros administran la vacuna a los pacientes por un cargo de \$10 por cada dosis. Para más información o para identificar un centro cerca de usted llame al (787)- 758-3411 al Programa de Servicios Clínicos o acceda la siguiente dirección electrónica: www.saludprimariapr.org

Coalición para el Control de Cáncer de Puerto Rico
PROGRAMA DE CONTROL COMPRENSIVO DE CÁNCER
www.controldecancerpr.org

CONSULTE CON SU MÉDICO O PROFESIONAL DE LA SALUD PARA OBTENER MÁS INFORMACIÓN SOBRE LA VACUNA CONTRA EL VPH



VPH INFORMATE
<http://www.cdc.gov/hpv/>

¿Cómo obtener la vacuna para el Virus del Papiloma Humano (VPH)?

La siguiente información es una guía, que esperamos le sea útil para identificar una clínica de vacunación o proveedor, donde pueda obtener la vacuna contra elVPH para su(s) hija(s), hijo(s) o usted.

ADULTOS JÓVENES DE 19-26 AÑOS:

- Si su plan médico es El Plan del Gobierno de PR o no tiene plan médico:
 - o Los Centros de Salud Esteban Calderón, administran la vacuna, a un costo establecido, a aquellos jóvenes mayores de 18 años que su plan médico no cubre el costo de la vacuna o no poseen plan médico. Existen 5 centros en toda la isla: Arecibo (tel. 787-817-6772), Bayamón (tel. 787-787-5151 ext. 2397), Ponce (787-842-8881), Mayagüez (tel. 787-833-3085) y Las Piedras (787-733-2196).
 - o Industria Farmacéutica – existen programas por parte de las farmacéuticas que ofrecen las vacunas libre de costos, consulte a su médico acerca de estos programas.
- Si su plan médico es privado:
 - o Verifique con su seguro médico si le cubre la vacuna contra elVPH (Gardasil® o Cervarix®).
 - o Si su plan médico privado cubre la vacuna, comuníquese con su médico y pregunte si tiene disponible la vacuna delVPH o si la puede referir a un médico que la tenga disponible.
 - o Los Centros de Salud Esteban Calderón, administran la vacuna, a jóvenes mayores de 18 años. Existen 5 centros en toda la isla: Arecibo (tel. 787-817-6772), Bayamón (tel. 787-787-5151 ext. 2397), Ponce (787-842-8881), Mayagüez (tel. 787-833-3085) y Las Piedras (787-733-2196).
- Si su plan médico privado no cubre la vacuna:
 - o Existen programas por parte de las farmacéuticas que ofrecen las vacunas libre de costos, consulte a su médico a cerca de estos programas.

Coalición para el Control de Cáncer de Puerto Rico
PROGRAMA DE CONTROL COMPRENSIVO DE CÁNCER
www.controldecancerpr.org

CONSULTE CON SU MÉDICO O PROFESIONAL DE LA SALUD PARA OBTENER MÁS INFORMACIÓN SOBRE LA VACUNA CONTRA EL VPH

Anal cancer



¿Existe alguna prueba para detectar el cáncer anal?

✓ Una de las pruebas de detección temprana para cáncer anal es el examen digital rectal, donde el médico palpa el interior del recto para detectar si hay alguna anomalía.

✓ Otra prueba es el pap anal. El pap anal es una prueba de detección temprana muy similar al pap cervical, realizado en mujeres. Expertos han recomendado que hombres homosexuales, bisexuales y VIH positivo se realicen anualmente un pap anal, dado que son poblaciones de alto riesgo para desarrollar cáncer anal. Esta prueba es importante porque en ocasiones estas lesiones pueden no ser palpables en el examen digital rectal.

Un hallazgo anormal en las pruebas de detección temprana debe ser sometido a un examen más completo que incluya una biopsia, para poder descartar la presencia de cáncer anal.



INFÓRMATE

Pruebas de Detección Temprana para Cáncer Anal

Clinica de Enfermedades Infecciosas
Clinica de la Escuela de Medicina 2da piso
Reporto Metropolitano
Centro Médico de Puerto Rico
Ave. América Miranda
787-679-4330/787-758-7910

Centro para el Control y Prevención de Enfermedades

(CDC por sus siglas en inglés)
www.cdc.gov/spanish/immunizacion/index.html
www.cdc.gov/msmhealth/
www.cdc.gov/hpv/

Departamento de Salud de Puerto Rico

www.salud.gov.pr/Programas/ProgramaVacunacion/Pages/Vacunacionparaadolescentesyadultos.aspx



NIH NCI U54 GRANT (3U54CA096297-10S1)



Asociación de Salud Primaria de Puerto Rico
787-758-3411

Instituto Nacional de Cáncer
www.cancer.gov/espanol

Coalición para el Control de Cáncer de Puerto Rico
www.coalicioncontroldecancer.org

Coalición de Vacunación de PR VOCES
www.vocespr.org



VPH VIRUS DE PAPILOMA HUMANO Y CÁNCER ANAL

Contacto: Leticia Roman
787-772-8300 ext 1208
leticia.roman@upr.edu

¡Hombre protege tu salud!

¿Qué es el Virus del Papiloma Humano?

El Virus del Papiloma Humano (VPH) es el virus de transmisión sexual más común a nivel mundial. El mismo puede ocasionar verrugas genitales y cáncer tanto en hombres como en mujeres. En los hombres, esta infección está asociada al desarrollo de cáncer oral, de pene y ano. En el caso de hombres que tienen relaciones sexuales con hombres, el 98 % de los casos de cáncer de ano están asociados a la infección por VPH.

¿Cómo se contagia el VPH?

El VPH se transmite por contacto de piel a piel durante las relaciones sexuales (sexo oral, vaginal o anal), con alguien que está infectado con el VPH.

Sabías que estadísticas indican que...

- ha habido un aumento en el número de casos nuevos de VIH entre hombres que tienen sexo con hombres.
- estar infectado con VIH es un factor de riesgo para la infección con el VPH.
- un hombre que tiene sexo con hombres y es VIH positivo tiene mayor probabilidad de ser diagnosticado con cáncer anal.
- un hombre que tiene SIDA tiene mayor probabilidad de ser diagnosticado con cáncer anal.



¿Estoy yo a riesgo?

Aquellos que practican el sexo anal sin protección están en mayor riesgo de infectarse con VPH y desarrollar cáncer anal. Otros factores de riesgo son: tener múltiples parejas sexuales masculinas, fumar, y tener el sistema inmunológico débil, como por ejemplo ser VIH positivo.

¿Qué es cáncer anal?

El cáncer anal es un tipo de cáncer poco común que afecta los tejidos que rodean la abertura del ano.

¿Cuáles son los síntomas del cáncer anal?

Muchas veces este tipo de cáncer no presenta síntomas. En aquellos casos que sí presentan síntomas, los más comunes incluyen dolor, presión o picazón en el área del ano, así como enrojecimiento, inflamación y malestar anal frecuente. Las personas también pueden presentar una masa cerca del ano, sangrado o secreciones anales, así como cambios en sus hábitos de evacuación.

¿Cómo puedo prevenir el cáncer anal?

- ✓ Vacúnese contra el VPH.
- ✓ Protéjase contra el VIH. El VIH suprime el sistema inmunológico, de esta manera puede facilitar la infección por distintos virus como lo es el VPH.
- ✓ Reduzca la cantidad de parejas sexuales.
- ✓ Utilice condones al momento de tener relaciones sexuales, sin embargo, el uso del condón no protege del todo contra infecciones de VPH.
- ✓ No fume.



¿Cuáles son las vacunas contra el VPH?

Existen dos vacunas para prevenir la infección con ciertos tipos de VPH, estas son: Gardasil® y Cervarix®.

✓ Gardasil® está recomendada para hombres y mujeres de 11 a 26 años de edad. La misma protege contra los subtipos que causan cáncer cervical, verrugas genitales, cáncer de ano, de vulva y de vagina.

✓ Cervarix® está recomendada sólo para mujeres entre 11 a 25 años de edad. La misma protege contra los subtipos del virus que causan cáncer cervical, de vulva y de vagina en las mujeres.

¡VACÚNATE!



Clinical Trials on AIDS Malignancies: The ANCHOR Study



https://www.dropbox.com/s/upu5fmucvtao7pc/FRS_UCSF_SPANISH_FINAL_101314.mov?dl=0



For more information,
including free resources for yourself
and your patients, visit:
cdc.gov/vaccines/teens

Email questions or comments to
CDC Vaccines for Preteens and Teens:

PreteenVaccines@cdc.gov

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- Cristina Muños, MS, CT
- Aids Malignancy Consortium PR Site, PI Dr. Maribel Tirado

Related Publications

- Ortiz AP, Romaguera J, Pérez C, Palefsky J, Otero Y, Mendez K, Soto-Salgado M, Valle Y, Da Costa M, Tortolero-Luna G. **Human papillomavirus infection in women in Puerto Rico: Agreement between physician- versus self-collected anogenital specimens.** Journal of Lower Genital Tract Disease (In press)
- Ortiz AP, Alejandro N, Pérez C, Otero Y, Soto-Salgado M, Palefsky JM, Tortolero-Luna G, Romaguera J. **Acceptability of Cervical and Anal HPV self-sampling in a sample of Hispanic Women in Puerto Rico.** PRHSJ Vol. 31 No. 4 • December, 2012
- Colón-López V, Ortiz AP, Del Toro-Mejías LM, García H, Clatts MC, Palefsky J. **Awareness and knowledge of Human Papillomavirus (HPV) infection among high-risk men of Hispanic origin attending a Sexually Transmitted Infection (STI) clinic.** BMC Infect Dis. 2012 Dec 12;12:346. doi: 10.1186/1471-2334-12-346. PubMed PMID: 23231727; PubMed Central PMCID: PMC3529119.
- Ortiz AP, Pérez-Irizarry J, Soto-Salgado M, Suárez E, Pérez N, Cruz M, Palefsky J, Tortolero-Luna G, Miranda S, Colón-López. **Human papillomavirus-related cancers among people living with AIDS in Puerto Rico.** Prev Chronic Dis. 2014 May 15;11:E80. doi: 10.5888/pcd11.130361.

Related Publications (cont.)

- Ortiz AP, Colón-López V, Girona-Lozada G, Botello-Harbaum MT, Sheon N, Guiot HM, Román-Torres L, Díaz-Santana MV, Miranda-De LS, Palefsky JM. **Report of the 2012 capacity building for HIV-HPV clinical trials recruitment among minority underserved populations of Hispanic origin in Puerto Rico.** P R Health Sci J. 2012 Sep;31(3):185-7. PubMed PMID: 23038895.
- Colón-López V, Ortiz AP, Palefsky J. **Burden of human papillomavirus infection and related comorbidities in men: implications for research, disease prevention and health promotion among Hispanic men.** P R Health Sci J. 2010 Sep;29(3):232-40. Review. PubMed PMID: 20799510; PubMed Central PMCID: PMC3038604.
- Ortiz AP, Soto-Salgado M, Suárez E, del Carmen Santos-Ortiz M, Tortolero-Luna G, Pérez CM. **Sexual behaviors among adults in Puerto Rico: a population-based study.** J Sex Med. 2011 Sep;8(9):2439-49. doi: 10.1111/j.1743-6109.2011.02329.x. Epub 2011 Jun 15. PubMed PMID: 21676177; PubMed Central PMCID: PMC3474935.
- Ortiz AP, Ortiz-Ortiz KJ, Traverso-Ortiz M, Ríos MY, Colón-López V, Palefsky JM. **Anal cancer trends in Puerto Rico from 1985 to 2005: the potential impact of the AIDS epidemic.** AIDS Patient Care STDS. 2014 Apr;28(4):165-7. doi: 10.1089/apc.2013.0365. Epub 2014 Mar 24. No abstract available.

Related Publications (cont.)

- Colón-López V, Ortiz AP, Soto-Salgado M, Torres-Cintrón M, Mercado-Acosta JJ, Suárez E. **Anal cancer incidence and mortality in Puerto Rico.** P R Health Sci J. 2013 Jun;32(2):76-81. PubMed PMID: 23781623; PubMed Central PMCID: PMC3770822.
- Colón-López V, Ortiz AP, Palefsky J. **Burden of human papillomavirus infection and related comorbidities in men: implications for research, disease prevention and health promotion among Hispanic men.** P R Health Sci J. 2010 Sep;29(3):232-40. Review. PubMed PMID: 20799510; PubMed Central PMCID: PMC3038604.
- González VC, Moreno CA, Rivera AI, Sánchez CT, Guiot HM, Pérez N, Colón-López V, Ortiz-Ortiz K, Ortiz AP. (2012). **Cáncer de Ano.** Registro Central de Cáncer, Centro Comprensivo de Cáncer Universidad de Puerto Rico. (Vol 4)
- VOCES: Coalición de Vacunación de Puerto Rico. **La Vacuna que previene el cáncer asociado al Virus del Papiloma Humano (VPH): De la recomendación a la acción.** Diciembre 2014. <http://vocespr.org>