

## Supplementary Appendix

Accompanying the manuscript:

### **Cost-Effectiveness of Cervical Cancer Screening with Human Papillomavirus (HPV) DNA Testing and HPV-16,18 Vaccination**

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- (1) Natural History Model Structure, Calibration, and Evaluation
- (2) Selected Calibration and Evaluation Results
- (3) Prevention Strategies and Assumptions
- (4) Results for All Prevention Strategies under Alternative Vaccine Performance Assumptions
- (5) Selected Results of Sensitivity and Exploratory Analyses

## Introduction

In the following supplementary appendix, we describe a model of human papillomavirus (HPV) and cervical cancer. The appendix is organized in the following manner. First, we briefly describe the model's structure. Next, we summarize the procedures used for model calibration. We also summarize procedures for model performance evaluation in terms of both face validity and external consistency, defined here as the comparison of model-predicted outcomes to data not used in calibration. Examples of the results from the calibration and performance evaluation for the model are also included. In addition to the information presented here, we also direct the reader to a paper and technical appendix we have published previously in an open-access journal,<sup>1</sup> which provides documentation of the model structure, calibration, and evaluation.

Having described the natural history model, we continue by describing all screening and vaccination strategies considered in the cost-effectiveness analyses. We provide further detail about assumptions made in the base case for these strategies as well as in sensitivity and exploratory analyses. Details of modeled cervical cancer prevention strategies include those related to cost inputs and to assumptions used in modeling current screening practice.

Next, we provide modeled results for each alternative cancer prevention strategy in terms of the expected reduction in lifetime risk of cervical cancer, discounted lifetime costs, discounted quality-adjusted life years, and discounted life years. In addition to expected values, results also include the range of values that reflect uncertainty about the natural history of disease given available epidemiologic data. For the purpose of comparison given relative uncertainty about HPV vaccination, we also show these same results for alternative assumptions about the effectiveness and duration of protection provided by an HPV vaccine. Finally, we show selected results for a range of sensitivity and exploratory analyses including vaccine-induced herd immunity, screening test characteristics, and current screening practice.

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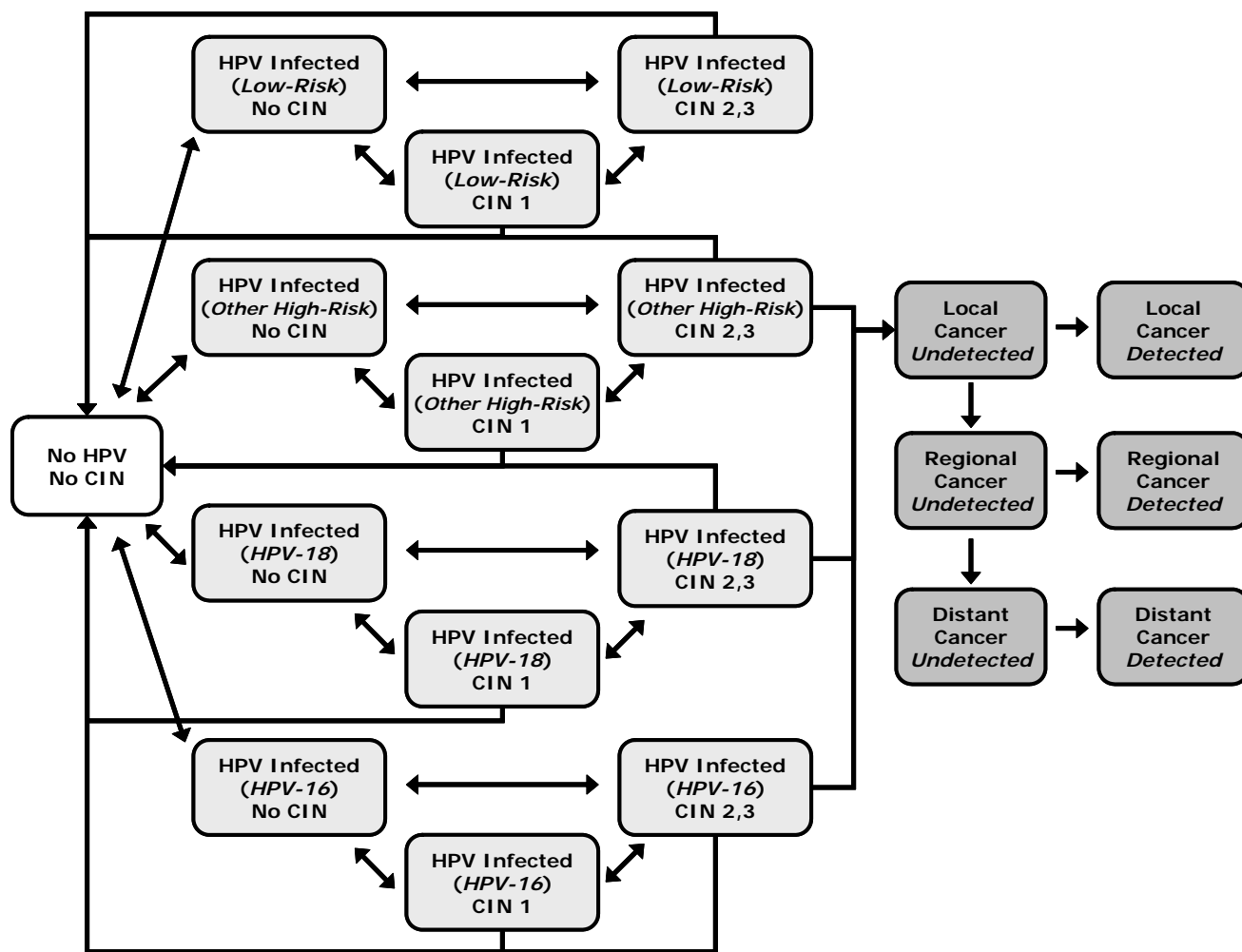
<sup>1</sup> Goldhaber-Fiebert JD, Stout NK, Ortendahl J, Kuntz KM, Goldie SJ, Salamon JA. Modeling human papillomavirus and cervical cancer in the United States for analyses of screening and vaccination. *Popul Health Metr* 2007, 5:11 (29 October 2007).

## Model Structure

The model is an individual-based stochastic model of cervical cancer. The model follows individual women throughout their lives, computing measures of health benefit including lifetime cervical cancer risk, cancer incidence and mortality, life expectancy and quality-adjusted life expectancy. The model also records all costs associated with events such as vaccination, screening, diagnostic follow-up, treatment of precancer, and cancer treatment and care. By simulating a large number of individual women, expected health benefits and costs of alternative prevention policies that may include screening, vaccination or both can be assessed.

The model's structure was designed to be consistent with current biological understanding of cervical carcinogenesis (**Supplementary Figure 1**). Each month, each individual has a chance of becoming infected with HPV. Those women with HPV infections have a chance of clearing their infections and of developing natural immunity to that HPV type. Type-specific natural immunity alters the probability of becoming infected with the same HPV type subsequently. HPV infection may lead to cervical intraepithelial neoplasia (CIN) of various degrees of severity. Only those women with persistent high-risk HPV infections and CIN2,3 may progress to invasive cervical cancer. Women with invasive cervical cancer may have their cervical cancer detected via symptoms, or else their cancer may progress to a more severe stage. All women have a chance of dying from all-cause mortality, and women with invasive cancer have an additional stage-specific chance of dying from their cancer.

**Supplementary Figure 1. Model Structure Schematic**



**Model Structure Schematic.** Each box represents a health state in the natural history model. Health states are mutually exclusive and exhaustive, meaning that an individual occupies one and only one health state at a given time. HPV infection is stratified by type. A large population of individual girls enters the model (one by one) at age 9 in the “No HPV and No CIN” health state, indicating that they are not currently HPV infected and have no cervical intraepithelial neoplasia. Each month, a simulated individual ages and has a chance to transition from her current state to another state (transitions denoted by the dark black arrows) or else to remain in her current state. All women also have a chance of dying from all-cause mortality, and women with invasive cancer have an additional stage-specific chance of dying from their cancer.

## Model Calibration

While the model structure defines relevant health states and possible transitions between those states, the probabilities of transitioning between states must also be defined. To do so, we derived initial estimates for monthly transition probabilities required by the model from published literature. Because of uncertainty about the estimates (model inputs) within each study reviewed and heterogeneity across studies due to methodological and population differences, we also defined wide plausible ranges around the model input values. However, not all combinations of model inputs from these wide plausible ranges produce model outputs consistent with observed epidemiologic data. Given the uncertainty in model inputs and the requirement of consistency with observed data, we used a calibration procedure.

Full details of model calibration have been described previously<sup>2</sup>. Briefly, the calibration of the model uses data from real-world studies to refine estimates of plausible combinations of model inputs so that model outputs are more consistent with observed epidemiologic data (calibration targets) than they were prior to calibration. To do this, the calibration procedure randomly samples sets of model input parameters from their plausible ranges, simulates model outputs based on each set of inputs, and then, using a likelihood-based good-of-fit scoring rule, selects sets of model inputs that are simultaneously consistent with multiple epidemiologic data sources.

**Supplementary Figure 2** shows several examples of the results of calibration. In Supplementary Figure 2, black solid horizontal bars represent calibration targets. Calibration targets are 95% confidence intervals derived from one or more empirical studies. Dashed gray lines represent the range of model outputs prior to calibration (e.g., the range of model outputs generated from sets of model inputs sampled from their entire plausible ranges). Green solid lines represent the range of model outputs that result from calibration. The subset of model inputs that generate the “good-fitting” model outputs (e.g. those that fall within the green lines and ideally within black solid horizontal bars of the calibration) represent calibrated model inputs.

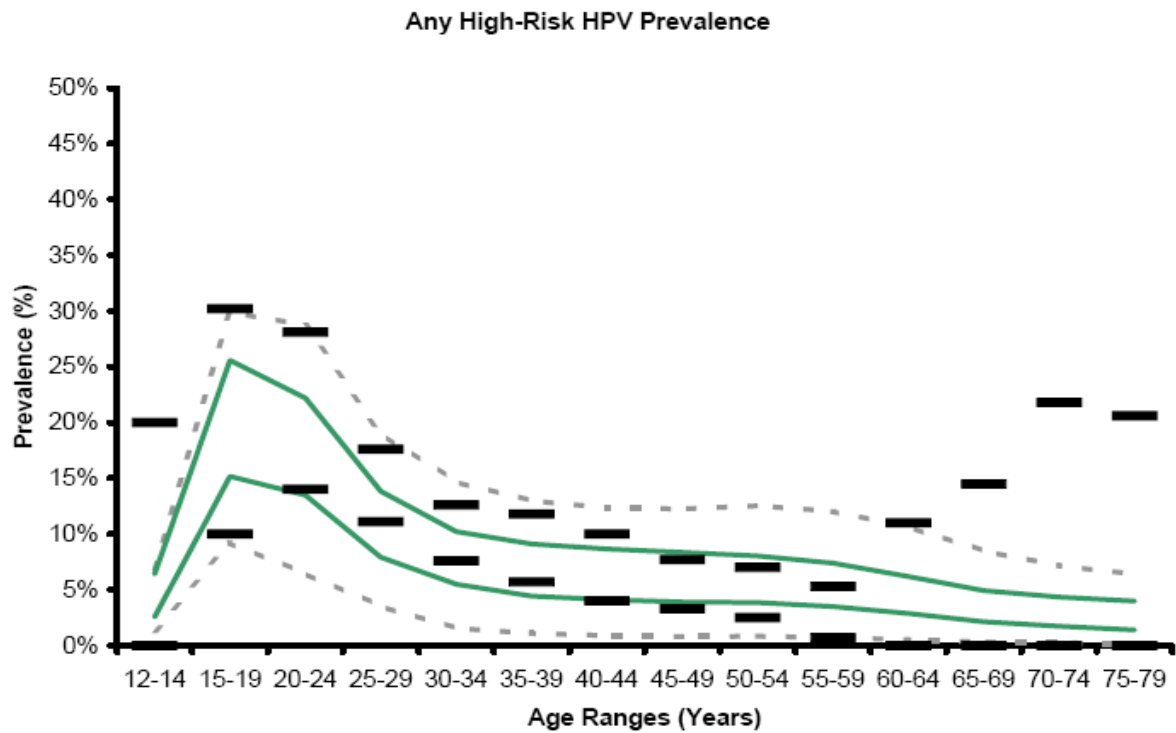
We perform all of our cost-effectiveness analyses as well as our sensitivity and exploratory analyses with multiple sets of model inputs sampled from the “good-fitting” calibrated model inputs. By doing so, we can estimate both the mean and range of quantities of interest such as the reduction in lifetime risk of cancer, total lifetime costs, and quality-adjusted life expectancy. We can also use the results from multiple sets of model inputs to perform probabilistic sensitivity analyses, in which we capture the uncertainty of our cost-effectiveness results with distributions of model inputs that are all consistent with observed epidemiologic data.

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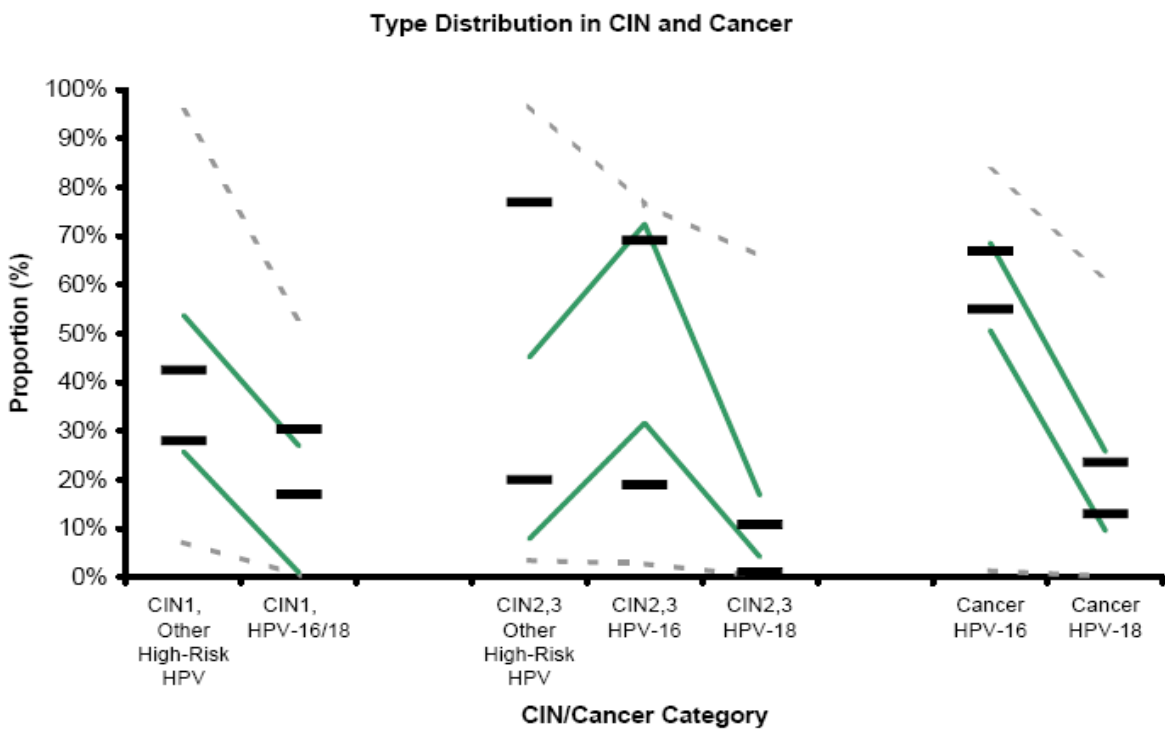
<sup>2</sup> Goldhaber-Fiebert JD, Stout NK, Ortendahl J, Kuntz KM, Goldie SJ, Salamon JA. Modeling human papillomavirus and cervical cancer in the United States for analyses of screening and vaccination. *Popul Health Metr* 2007, 5:11 (29 October 2007).

**Supplementary Figure 2. Selected Model Calibration Results**

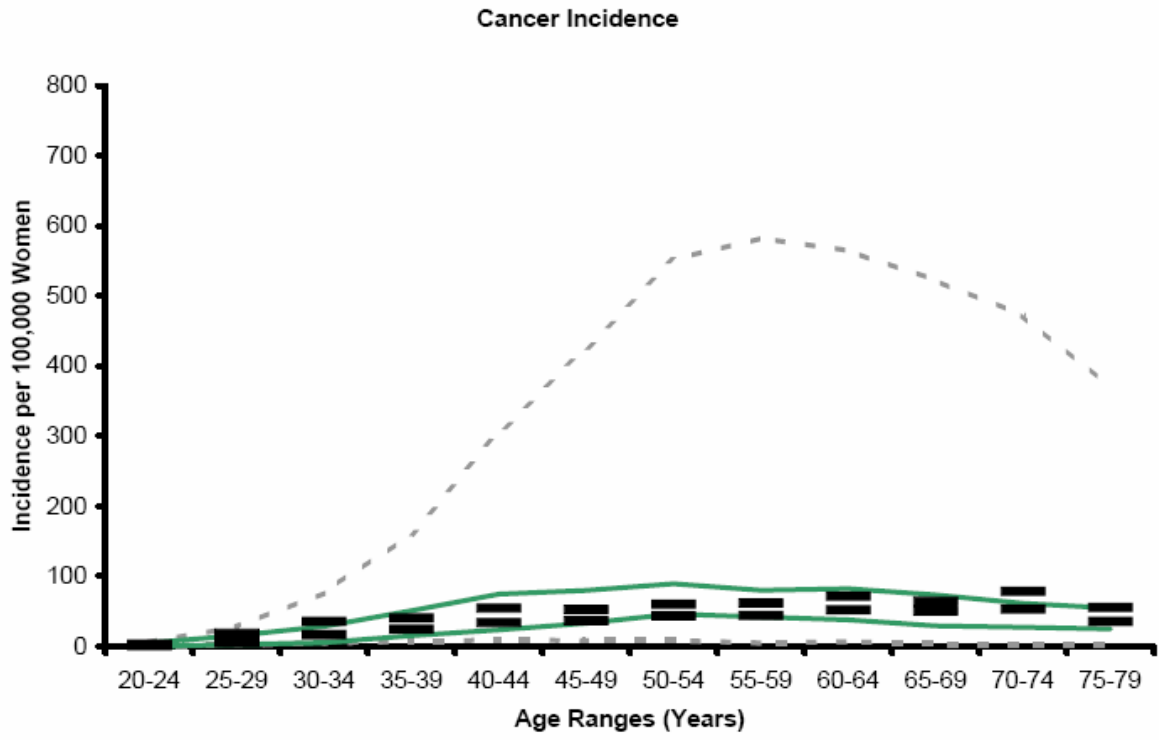
**Panel A**



**Panel B**



Panel C



## Model Performance Evaluation

We evaluated the performance of the model in terms of face validity and external consistency by comparing model output to data from several large U.S. screening studies not used in the parameterization or calibration of the natural history model. These included the Portland Kaiser Permanente and the ASCUS/LSIL Triage Study for Cervical Cancer (ALTS) studies as well as data from the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) Program<sup>3</sup>.

To compare model results to our evaluation targets, we simulated five screening scenarios for each of the 50 parameter sets from the calibrated natural history model. Scenarios included no screening as well as screening using cervical cytology at four levels of intensity: every 1, 2, 3, or 5 years from age 18 to 70. Screening with cervical cytology began when women were 18 years old and continued until a woman reached 70 years of age. HPV-DNA testing was used to triage cytology results of atypical squamous cells of unknown significance (ASC-US results). For all women with more severe cytologic results than ASC-US and for those women with ASC-US who tested positive for high-risk HPV types, colposcopy and biopsy were performed. Appropriate treatment or management was reserved for histologically-confirmed CIN2,3 or worse, with other women who had been referred to colposcopy being rescreened every 6-12 months until they had 3 consecutive negative test results. Further details about how screening is modeled and other assumptions associated with screening are presented below.

Because data from these studies were derived from women with different past patterns of screening, we combined modeled outputs from our five screening scenarios to produce modeled outputs that would be consistent with a cohort of women whose cervical cancer screening patterns matched nationally-observed, age-specific patterns of screening for performance evaluation with respect to the Portland Kaiser Permanente and ALTS studies (see section on screening frequency below for further details). When we compared model outputs to data from SEER, we combined modeled outputs from our five screening scenarios corresponding to patterns of screening observed for women with invasive cervical cancer, as their screening patterns differ from those in the general population<sup>4</sup>.

For all evaluation targets, we compared model output to the 95% confidence intervals from the empirical data. Baseline data from the Portland Kaiser Permanente study were used to calculate the cross-sectional, age-specific prevalence of high-risk HPV and of cervical cytology results that were high-grade squamous intraepithelial lesion or worse (HSIL+). Baseline data from the ALTS study were used to calculate the cross-sectional proportions of HPV-positive persons with CIN1 and CIN2+ (e.g., histology of CIN2 or worse) having HPV-16, HPV-18, or other high-risk HPV types. Data from SEER for 2003 were used to derive incidence of age-specific detected invasive cervical cancer in the presence of cervical cancer screening, and analogous estimates were calculated from IARC data for the U.S. prior to widespread screening. We estimated the

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<sup>3</sup> Surveillance, Epidemiology, End Results (SEER) Cancer Statistics Review, 1975-2001. National Cancer Institute, US DHHS, PHS, NIH, NCI 2004

<sup>4</sup> (a) Parazzini F, Hildesheim A, Ferraroni M, La VC, Brinton LA: Relative and attributable risk for cervical cancer: a comparative study in the United States and Italy. *Int J Epidemiol* 1990, 19:539-545.

(b) Schairer C, Brinton LA, Devesa SS, Ziegler RG, Fraumeni JF, Jr.: Racial differences in the risk of invasive squamous-cell cervical cancer. *Cancer Causes Control* 1991, 2:283-290.

(c) Shields TS, Brinton LA, Burk RD, Wang SS, Weinstein SJ, Ziegler RG, Studentsov YY, McAdams M, Schiffman M: A case-control study of risk factors for invasive cervical cancer among U.S. women exposed to oncogenic types of human papillomavirus. *Cancer Epidemiol Biomarkers Prev* 2004, 13:1574-1582.



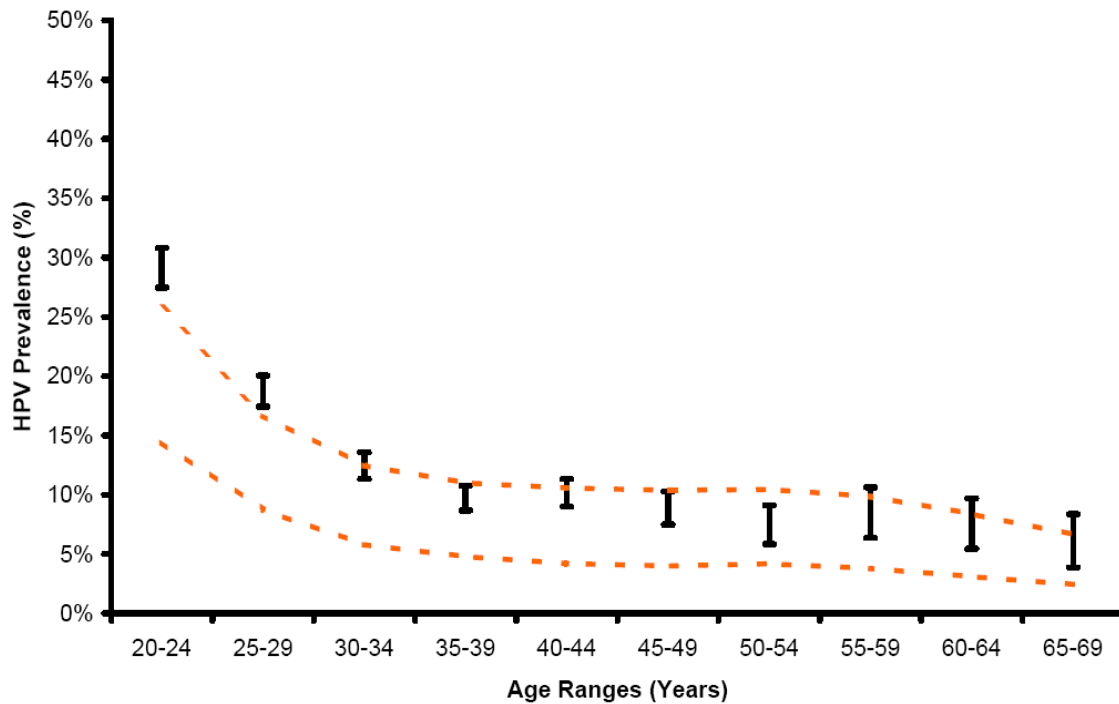
incidence reductions due to screening by subtracting SEER incidence rates from International Agency for Research on Cancer (IARC) rates by age<sup>5</sup>. SEER data from 1996 to 2000 was used to calculate the proportion of invasive cervical cancer cases detected at each SEER historical stage (local, regional, and distant).

**Supplementary Figure 3** shows the comparison of modeled screening outputs (orange dashed lines) to evaluation targets (black solid horizontal bars).

**Supplementary Figure 3. Model Performance Evaluation Results**

**Panel A**

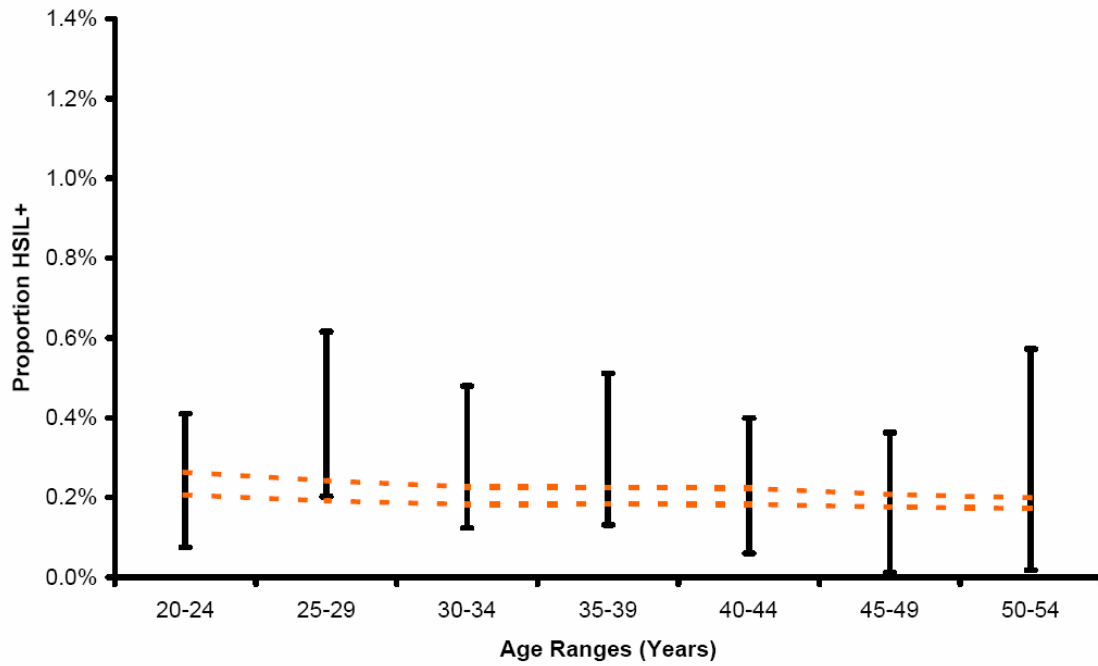
Age-Specific Prevalence of Any High-Risk HPV Regardless of CIN Status



<sup>5</sup> International Agency for Research on Cancer (IARC). <http://www.iarc.fr> (last accessed September 25, 2007)

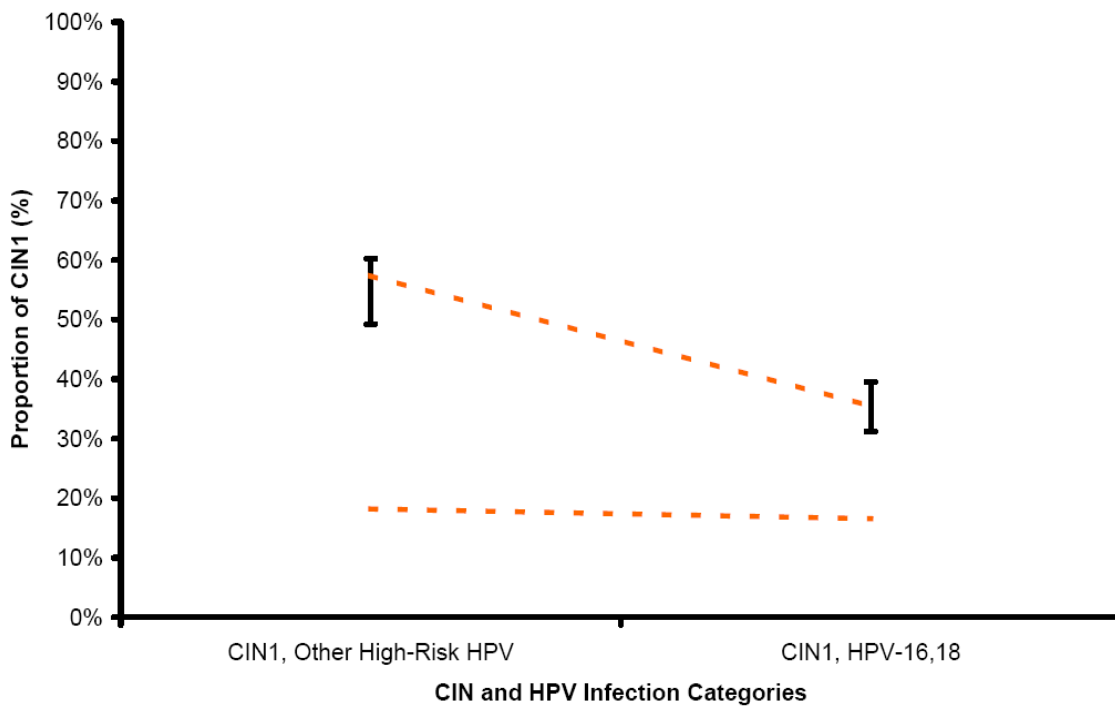
**Panel B**

Age-Specific Proportion Testing HSIL+



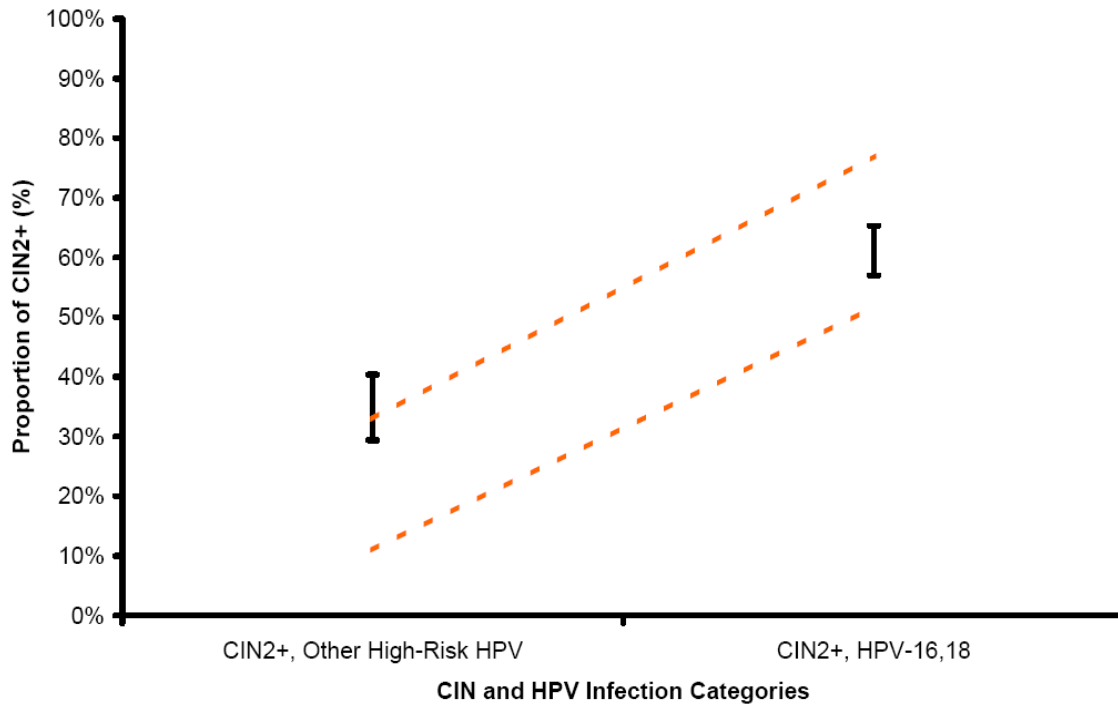
**Panel C**

CIN1 Proportion Infected with HPV-16,18 and Other High-Risk HPV Types



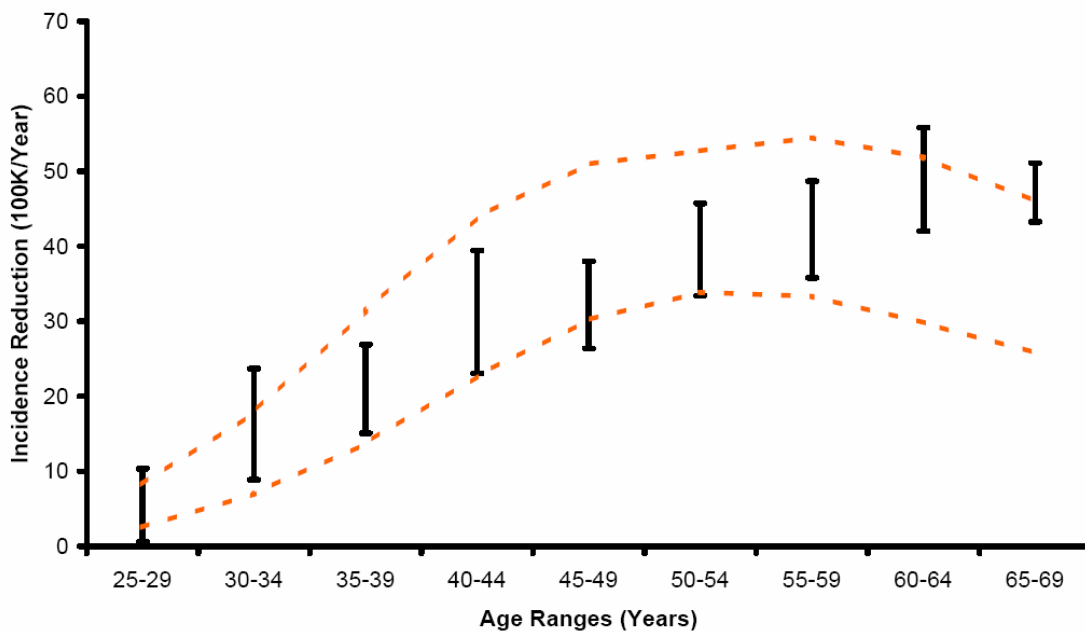
**Panel D**

CIN2+ Proportion Infected with HPV-16,18 and Other High-Risk HPV Types



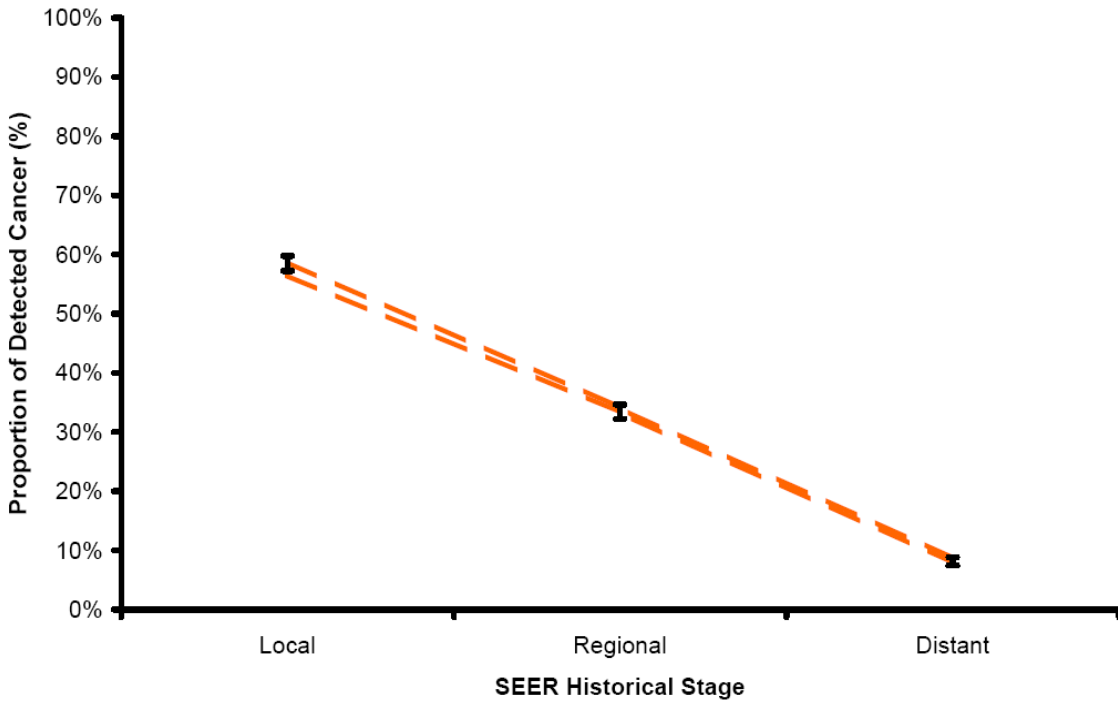
**Panel E**

Age-Specific Cervical Cancer Incidence Reduction (Pre-Screening Incidence vs. 2003 Incidence)



**Panel F**

**Stage Distribution in Detected Invasive Cervical Cancers**



## Cancer Prevention Strategies

Each cervical cancer prevention strategy considered in the cost-effectiveness analysis has multiple attributes: 1) the age at which screening starts; 2) the frequency with which screening is performed (e.g., the screening interval); 3) the screening tests used as primary screening tests and triage tests for younger women; 4) the screening tests used as primary screening tests and triage tests for older women; 5) the age at which the screening tests used for younger women are replaced by those used for older women; 6) the use of prophylactic vaccination for pre-adolescent girls.

Possible values for each attribute of a cancer prevention strategy are presented in **Supplementary Table 1, Section A**. For example, one strategy considered starts screening at age 18, screens women every 2 years, screens all women between ages 18 and 70 with cervical cytology followed by HPV-DNA testing for ASC-US, and does not vaccinate pre-adolescent girls. Such a strategy is quite similar to recommendations from the last cervical cancer screening guidelines, published between 2001 and 2003.<sup>6</sup> Another strategy starts screening at age 21, screens women every 3 years, screens women between ages 21 and 30 with cervical cytology followed by HPV-DNA testing for ASC-US, screens women from age 30 to 70 with HPV-DNA testing followed by cytology for all positive results, and vaccinates pre-adolescent girls. Screening strategies included for consideration in this analysis were chosen based upon plausibility – those recommended by current guidelines, those under consideration by policy-making organizations, and those under study in clinical trials and observational studies. For example, we do not consider strategies that use cytology and HPV-DNA testing in combination for women between the ages of 18 and 25 here, but we do consider a strategy using HPV-DNA testing with cytology triage for all ages.

Screening strategies follow a consistent pattern. At prescribed intervals, women receive cervical cancer screening. For a given episode of cervical cancer screening, a primary screening test (either HPV-DNA testing or cytology) or tests (combined HPV-DNA testing and cytology) are performed, depending on the strategy being considered. In the case of the use of a single primary screening test, the other screening test is reserved as a triage (reflex) test for women who had abnormal results on the first test (e.g., HPV-DNA testing triage for abnormal cytology results) and is performed on the sample collected during the primary screening test. The definition of a test result as abnormal depends on the screening test used: 1) positive for the presence of high-risk HPV DNA in the case of HPV-DNA testing; or 2) atypical squamous cells of unknown significance or more severe cellular changes in the case of cytology. Women who also have abnormal results on this second, triage screening test are referred to diagnostic testing (colposcopy and biopsy). Women with histologically confirmed abnormal results (in this case, CIN2,3) are referred for appropriate treatment. For women referred to colposcopy, biopsy,

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<sup>6</sup> (a) Wright TC, Cox JT, Massad LS, Twiggs LB, Wilkinson EJ for the 2001 ASCCP-Sponsored Consensus Conference. 2001 Consensus Guidelines for the management of women with cervical cytological abnormalities. *JAMA* 2002;287:2120-9.

(b) Saslow D, Runowicz C, Solomon D, Moscicki AB, Smith RA, Eyre HJ et al. American Cancer Society guideline for the early detection of cervical neoplasia and cancer. *CA Cancer J Clin* 2002;52:342-62.

(c) ACOG Practice Bulletin: clinical management guidelines for obstetrician-gynecologists. Number 45, August 2003. Cervical cytology screening (replaces committee opinion 152, March 1995). *Obstet Gynecol* 2003;102:417-27.

(d) U.S. Preventive Services Task Force. Guide to Clinical Preventive Services. 3rd ed. 2003, U.S. Department of Health and Human Services: Washington, DC.

(e) Wright TC, Schiffman M, Solomon D, Cox JT, Garcia F, Goldie SJ, et al. Interim guidance for the use of human papillomavirus DNA testing as an adjunct to cervical cytology for screening. *Obstet Gynecol* 2004;103:304-9.

and/or treatment, subsequent episodes of cervical cancer screening occur more frequently until they have 3 consecutive negative results, at which point they return to screening at intervals consistent with the original prescribed interval of the strategy.

Assumptions regarding prevention strategies are presented in **Supplementary Table 1, Section B**. In the base case, both screening and vaccination coverage are assumed to be 100% for the purpose of fair comparison of their maximum potential benefit. Diagnostic work-up for all women with cytology results of low-grade squamous intraepithelial lesion (LSIL) or worse, whether the screening strategy used is cytology with HPV triage or HPV with cytology triage, involves referral to colposcopy/biopsy. Women with ASC-US results who test positive for high-risk HPV types are also referred to colposcopy and biopsy, but those who test negative return to routine screening. Treatment is reserved for women with CIN2,3. All women who undergo diagnostic work-up are screened more frequently (every 6-12 months) until they have 3 consecutive negative tests. Additionally, for women who test positive for high-risk HPV types, in the HPV with cytology triage strategies, more frequent screening is performed until they have 3 consecutive negative results.

Vaccine coverage with the 3-dose vaccine course is assumed to be 100% in the base case for pre-adolescent girls prior to age 12. Vaccination is assumed to provide complete life-long protection against vaccinated types, though duration of protection is also explored in a sensitivity analysis where we repeat the base case analysis with a vaccine that provides 15 years of protection for pre-adolescent vaccinated girls. Vaccine-induced immunity is modeled in a similar way to immunity derived from clearing an HPV infection. The probability of infection with the vaccinated type is reduced – in the base case, this reduction is 100% though alternative assumptions are explored in sensitivity analyses (for example, we repeat the base case analysis with a vaccine that reduces the HPV type-specific infection probability by 75% for each HPV type targeted by the vaccine). The risk of infection with HPV types other than vaccinated types is assumed to remain unchanged regardless of vaccination status. No cross-protection effects (e.g., reduction in the infection risk of other closely-related HPV types not covered by the vaccine's targeted HPV types for vaccinated women) are assumed in the base case, though this assumption is also examined in exploratory analyses. For exploratory analyses of women vaccinated after they have had a prior infection(s) with a vaccine-targeted HPV type or types (i.e., women in their 20s who are already sexually active and have been infected with HPV-16 and/or HPV-18), no vaccine-conferred protection against that type is assumed. No herd immunity effects (e.g., reduction in the infection risk with vaccine-targeted HPV types for women who have not been vaccinated) are assumed in the base case, though this assumption is examined in exploratory analyses. In these sensitivity analyses, unvaccinated women (at vaccine coverage levels of 70% and 90%) have their HPV type-specific probabilities of infection reduced by a likely optimistic 30% for HPV types targeted by the vaccine. The age at which this benefit begins is systematically varied starting at age 20, 30, 40, or 50, depending on assumptions about whether and also when herd immunity may confer benefit.

**Supplementary Table 1. Cancer Prevention Strategies: Attributes and Assumptions \***

<b>A. Strategy Attributes</b>			
<b>Attribute</b>	<b>Value</b>	<b>Abbreviation</b>	
Screening start age	18 years old	18	
	21 years old	21	
	25 years old	25	
Screening frequency	Never	No Screening	
	Every 1 year	1yr or q1	
	Every 2 years	2yrs or q2	
	Every 3 years	3yrs or q3	
	Every 5 years	5yrs or q5	
Screening strategies for younger women	Cervical cytology followed by HPV-DNA testing for ASC-US	Cytology with HPV triage	
	HPV-DNA testing followed by cytology for all positive results	HPV with Cytology triage	
Screening strategies for older women	Cervical cytology followed by HPV-DNA testing for ASC-US	Cytology with HPV triage	
	HPV-DNA testing followed by cytology for all positive results	HPV with Cytology triage	
	Cervical cytology and HPV-DNA testing in combination	Combination Cytology and HPV testing or Combination HPV / Cytology	
Screening switch age	Never	No Switch	
	25 years old	25	
	30 years old	30	
	35 years old	35	
Age at vaccination†	Never	No Vaccine	
	9-12	Vaccinated	
<b>B. Strategy Assumptions</b>			
<b>Category</b>	<b>Assumption</b>		
Screening coverage†	100%		
Diagnostic work-up: cytology results of LSIL or	Colposcopy/biopsy		

worse	
Diagnostic work-up: cytology result of ASC-US	HPV-DNA testing triage (reflex) High-Risk HPV positive: colposcopy/biopsy High-Risk HPV negative: return to routine screening
Determination of CIN2,3	Colposcopy/biopsy determine cervical histology
Treatment for CIN2,3 or worse	Standard guidelines <sup>7</sup>
Management for histologically-confirmed CIN1	Monitored every 6-12 months until three consecutive negative screening results
Management for women with other confirmed abnormalities (with or without treatment)	Screened annually until three consecutive negative screening results
Women who test positive for High-Risk HPV but negative on cytology triage	Re-screening at 6-12 months
Vaccine efficacy†‡	100%
Girls receiving 3 vaccine doses (full course)	100%
Infection risk with non-vaccinated types†	Unchanged by HPV vaccination status
Duration of vaccine-induced immunity†	Lifelong
Herd immunity from mass vaccination†§	None
Cross-protection from vaccination†¶	None

\* HPV = Human Papillomavirus; LSIL = Low-grade Squamous Intraepithelial Lesion; ASC-US = Atypical Squamous Cells of Unknown Significance; CIN = Cervical Intraepithelial Neoplasia; DNA = Deoxyribonucleic acid

† Varied in sensitivity analyses

‡ Vaccine efficacy is defined as the reduction in risk of HPV-16 and HPV-18 infections.

§ Herd immunity is defined as the reduction in risk of infection from HPV-16 and HPV-18 for women who are not vaccinated.

¶ Cross-protection is defined as the reduction in risk of infection from closely-related HPV types not targeted by the HPV vaccine for women who are vaccinated

<sup>7</sup> Wright TC Jr, Massad LS, Dunton CJ, Spitzer M, Wilkinson EJ, Solomon D. 2006 consensus guidelines for the management of women with cervical intraepithelial neoplasia or adenocarcinoma in situ. Am J Obstet Gynecol. 2007 Oct;197(4):340-5.



## Costs Associated with Cancer Prevention Strategies

To perform cost-effectiveness analyses, the model requires a set of cost inputs for HPV vaccination as well as for screening, diagnostic, and treatment procedures and for individuals' time and transport to receive these services. Input values and plausible ranges used in this analysis are presented in **Main Manuscript Table 1**. Details of their sources and rationale are presented below.

Direct medical and non-medical costs for screening, diagnostic, and treatment procedures as well as patient time and transport costs were derived from previous cost-effectiveness analyses<sup>8</sup>. Goldie et al.'s cost-effectiveness analysis provided the majority of base case cost estimates, with Kulasingam et al. providing the base case cost estimate for HPV-DNA testing and Sweet et al. providing the base case cost estimate for biopsies associated with colposcopy. Additionally, a literature review of articles relating to the cost of cervical cancer screening, diagnosis, and treatment in the United States was undertaken<sup>9</sup>, and, together with the sources used for base case estimates, plausible ranges (i.e., the minimum and maximum values reported in studies identified via literature review) for each cost category were defined.

Vaccination costs included both the cost of each of 3 doses of the HPV vaccine as well as the direct medical and non-medical costs associated with delivering the vaccine. The cost of the HPV vaccine dose itself – regardless of manufacturer – was estimated using the published manufacturer price of Gardasil in the United States, as Cervarix is not currently available in this market. This assumption is plausible in part because Cervarix and Gardasil have similar prices in the European context.<sup>10</sup> As the widespread implementation of HPV vaccination for pre-

<sup>8</sup> (a) Goldie SJ, Kim JJ, Wright TC. Cost-effectiveness of human papillomavirus DNA testing for cervical cancer screening in women aged 30 years or more. *Obstet Gynecol* 2004 Apr;103(4):619-31.

(b) Kulasingam SL, Kim JJ, Lawrence WF, Mandelblatt JS, Myers ER, Schiffman M, et al. Cost-effectiveness analysis based on the atypical squamous cells of undetermined significance/low-grade squamous intraepithelial lesion Triage Study (ALTS). *J Natl Cancer Inst* 2006 Jan 18;98(2):92-100.

(c) Sweet SG, Kim JJ, Wright TC, Goldie SJ. Cervical cancer screening: potential cost-effectiveness of technology to improve colposcopy and biopsy performance. Abstract presented at the 27th Annual Meeting of the Society for Medical Decision Making. 2005.

<sup>9</sup> (a) Bidus MA, Maxwell GL, Kulasingam S, Rose GS, Elkas JC, Chernofsky M, et al. Cost-effectiveness analysis of liquid-based cytology and human papillomavirus testing in cervical cancer screening. *Obstet Gynecol* 2006 May;107(5):997-1005.

(b) Insinga RP, Glass AG, Rush BB. The health care costs of cervical human papillomavirus-related disease. *Am J Obstet Gynecol* 2004 Jul;191(1):114-20.

(c) Insinga RP, Dasbach EJ, Elbasha EH. Assessing the annual economic burden of preventing and treating anogenital human papillomavirus-related disease in the US: analytic framework and review of the literature. *Pharmacoeconomics* 2005;23(11):1107-22.

(d) Goldie SJ, Kohli M, Grima D, Weinstein MC, Wright TC, Bosch FX, et al. Projected clinical benefits and cost-effectiveness of a human papillomavirus 16/18 vaccine. *J Natl Cancer Inst* 2004 Apr 21;96(8):604-15.

(e) Mandelblatt JS, Lawrence WF, Womack SM, Jacobson D, Yi B, Hwang YT, et al. Benefits and costs of using HPV testing to screen for cervical cancer. *JAMA* 2002 May 8;287(18):2372-81.

(f) Cantor SB, Levy LB, Cardenas-Turanzas M, Basen-Engquist K, Le T, Beck JR, et al. Collecting direct non-health care and time cost data: application to screening and diagnosis of cervical cancer. *Med Decis Making* 2006 May;26(3):265-72.

<sup>10</sup> (a) Merck & Co., Inc., Whitehouse Station, NJ, USA.

(b) HPV Vaccine Questions and Answers. CDC 2006 [cited 2007 Jan 9]; Available from: URL: <http://www.cdc.gov/std/hpv/STDFact-HPV-vaccine.htm>

(c) U.K girls to receive cervical cancer vaccine in 2008 (update 1) [cited 2007 Nov 20]; Available from: URL: <http://www.bloomberg.com/apps/news?pid=20601102&sid=axwtGrkoslC0&refer=uk>

adolescent girls has yet to be undertaken, other direct medical costs associated with the administration of vaccines were derived from vaccination cost studies for diseases including hepatitis B, influenza, and pertussis.<sup>11</sup> Patient time and transport costs associated with receiving each dose of the HPV vaccine were assumed to be the same as the time and transport costs associated with being screened.<sup>12</sup>

Costs extracted from all sources, for both base case estimates and plausible ranges, were inflated from their original year to 2004 U.S. dollars using the medical component of the consumer price index.<sup>13</sup>

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<sup>11</sup> (a) Wallace LA, Young D, Brown A, Cameron JC, Ahmed S, Duff R, et al. Costs of running a universal adolescent hepatitis B vaccination programme. *Vaccine* 2005 Dec 1;23(48-49):5624-31.

(b) Turner DA, Wailoo AJ, Cooper NJ, Sutton AJ, Abrams KR, Nicholson KG. The cost-effectiveness of influenza vaccination of healthy adults 50-64 years of age. *Vaccine* 2006 Feb 13;24(7):1035-43.

(c) Iskedjian M, Walker JH, Hemels ME. Economic evaluation of an extended acellular pertussis vaccine programme for adolescents in Ontario, Canada. *Vaccine* 2004 Oct 22;22(31-32):4215-27.

(d) De WP, Petit G, Erickson LJ, Guay M, Tam T, Law B, et al. Benefits and costs of immunization of children with pneumococcal conjugate vaccine in Canada. *Vaccine* 2003 Sep 8;21(25-26):3757-64.

(e) Mangtani P, Roberts JA, Hall AJ, Cutts FT. An economic analysis of a pneumococcal vaccine programme in people aged over 64 years in a developed country setting. *Int J Epidemiol* 2005 Jun;34(3):565-74.

(f) HIV counseling and testing system, version 4.0. Atlanta, GA: National Center for HIV, STD, and TB Prevention: Centers for Disease Control and Prevention; 1999.

<sup>12</sup> (a) Goldie SJ, Kim JJ, Wright TC. Cost-effectiveness of human papillomavirus DNA testing for cervical cancer screening in women aged 30 years or more. *Obstet Gynecol* 2004 Apr;103(4):619-31.

(b) Goldie SJ, Kohli M, Grima D, Weinstein MC, Wright TC, Bosch FX, et al. Projected clinical benefits and cost-effectiveness of a human papillomavirus 16/18 vaccine. *J Natl Cancer Inst* 2004 Apr 21;96(8):604-15.

<sup>13</sup> Medical Component of the Consumer Price Index. Census Bureau 2006 Available from: URL: <http://www.census.gov/prod/2005pubs/06statab/prices.pdf>

## Cervical Cancer Screening Frequency in the United States

The current usage of cervical cancer screening services in the United States is challenging to estimate. We conducted a literature review of studies of women's self-reported screening frequencies and studies of the concordance between self-reported screening frequencies and administratively-verified screening frequencies. Although guidelines on both screening frequency and screening technologies have been developed and disseminated, studies have demonstrated variation in screening frequencies among women in the U.S. both within and between different age groups and race/ethnic subpopulations.<sup>14</sup> Furthermore, studies designed to assess screening usage in samples of women that are representative of the general U.S. population often rely on self-report via questionnaires. Other studies have been conducted to assess the concordance of self-reported screening frequency and details of screening behavior derived from administrative databases.<sup>15</sup> They have found that both underreporting and overreporting of actual usage occurs and that both underreporting and overreporting appeared to differ between subgroups as well.

Using the studies from our literature review, we extracted data on cervical cancer screening frequencies and on the magnitude of underreporting and overreporting of screening frequency. When screening frequencies were reported for different age groups, we assumed that the frequencies of the younger age groups would be representative of the cohort of women we modeled and that they would remain relatively stable over the cohort's lifetime. We also extracted race/ethnicity-specific screening frequencies when available. We mapped data reported in each study to 5 standardized screening frequency categories: 1) not screened; 2) screened every 5 years; 3) screened every 3 years; 4) screened every 2 years; 5) screened every year. We adjusted the self-reported screening frequencies for both underreporting and overreporting to calculate race/ethnicity-specific screening frequencies, for use in our subgroup-specific analysis. Then, we used the proportion of women from each racial/ethnic subgroup (derived from the 2000 U.S. Census) to construct a weighted average of screening frequencies, for use in all other analyses.

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<sup>14</sup> (a) Adams EK, Breen N, Joski PJ. Impact of the National Breast and Cervical Cancer Early Detection Program on mammography and Pap test utilization among white, Hispanic, and African American women: 1996-2000. *Cancer* 2007 Jan 15;109(2 Suppl):348-58.

(b) Benard VB, Lee NC, Piper M, Richardson L. Race-specific results of Papanicolaou testing and the rate of cervical neoplasia in the National Breast and Cervical Cancer Early Detection Program, 1991-1998 (United States). *Cancer Causes Control* 2001 Jan;12(1):61-8.

(c) Hewitt M, Devesa S, Breen N. Papanicolaou test use among reproductive-age women at high risk for cervical cancer: analyses of the 1995 National Survey of Family Growth. *Am J Public Health* 2002 Apr;92(4):666-9.

(d) Hewitt M, Devesa SS, Breen N. Cervical cancer screening among U.S. women: analyses of the 2000 National Health Interview Survey. *Prev Med* 2004 Aug;39(2):270-8.

(e) Sirovich BE, Welch HG. The frequency of Pap smear screening in the United States. *J Gen Intern Med* 2004 Mar;19(3):243-50.

(f) Swan J, Breen N, Coates RJ, Rimer BK, Lee NC. Progress in cancer screening practices in the United States: results from the 2000 National Health Interview Survey. *Cancer* 2003 Mar 15;97(6):1528-40.

<sup>15</sup> (a) Fiscella K, Holt K, Meldrum S, Franks P. Disparities in preventive procedures: comparisons of self-report and Medicare claims data. *BMC Health Serv Res* 2006;6:122.

(b) McKenna MT, Speers M, Mallin K, Warnecke R. Agreement between patient self-reports and medical records for Pap smear histories. *Am J Prev Med* 1992 Sep;8(5):287-91.

(c) Vernon SW, Briss PA, Tiro JA, Warnecke RB. Some methodologic lessons learned from cancer screening research. *Cancer* 2004 Sep 1;101(5 Suppl):1131-45.

(d) Warnecke RB, Sudman S, Johnson TP, O'Rourke D, Davis AM, Jobe JB. Cognitive aspects of recalling and reporting health-related events: Papanicolaou smears, clinical breast examinations, and mammograms. *Am J Epidemiol* 1997 Dec 1;146(11):982-92.

**Supplementary Table 2. Screening Frequencies Used to Construct Current Screening Practice**

<b>Screening Frequency</b>	<b>Weighted Average for All Groups</b>	<b>White</b>	<b>African American</b>	<b>Asian/Pacific Islander</b>	<b>American Indian/Alaskan Native</b>	<b>Hispanic</b>
Not screened	26%	24%	29%	38%	34%	30%
Every 5 years	3%	4%	1%	8%	5%	3%
Every 3 years	9%	9%	8%	6%	10%	9%
Every 2 years	9%	9%	8%	6%	10%	9%
Every year	53%	54%	54%	42%	42%	49%

## Results

### Base case results

Base case results for each of the 186 screening and vaccination strategies are listed below in a series of tables. **Supplementary Table 3** shows the lifetime cumulative risk of cervical cancer for each strategy and the percentage reduction in cervical cancer incidence compared to no screening and no vaccination. In addition to reduction in cervical cancer, main model outputs, including discounted expected lifetime cost, discounted quality-adjusted life expectancy, and discounted life expectancy are shown for each strategy in **Supplementary Table 4** and **Supplementary Table 5**. An annual discount rate of 3% was used to express all costs and life expectancy in present value terms. For **Supplementary Tables 3-5**, ranges (from minimum to maximum) represent the uncertainty associated with the 50 different model parameterizations, reflecting uncertainty about the disease natural history.

### Alternative vaccination scenarios: efficacy, duration of immunity, herd immunity

Given uncertainty about the strength and duration of protection provided by HPV vaccination, we considered alternative scenarios. The first scenario we considered was one in which the strength of protection provided by pre-adolescent vaccination was 75% (i.e., vaccinated women have their risk of infection with HPV-16 and HPV-18 reduced by 75%). **Supplementary Tables 6, 7, and 8** show model results on reduction in the lifetime risk of cervical cancer, expected discounted lifetime costs, discounted quality-adjusted life expectancy, and discounted life expectancy for all prevention strategies, under this alternative assumption about vaccine effectiveness. The second scenario we considered was one in which pre-adolescent HPV vaccination provided complete protection against HPV-16 and HPV-18 but that this protection waned after 15 years. **Supplementary Tables 9, 10, and 11** show model results on reduction in the lifetime risk of cervical cancer, expected discounted lifetime costs, discounted quality-adjusted life expectancy, and discounted life expectancy for all prevention strategies, under this alternative assumption about vaccine duration. For **Supplementary Tables 6-11**, ranges (from minimum to maximum) represent the uncertainty associated with the 50 different model parameterizations, reflecting uncertainty about the disease natural history. **Supplementary Table 12** shows the expected cost-effectiveness results for these two HPV vaccine scenarios. For comparative purposes, **Supplementary Figure 4** shows the efficient frontiers under the base case and the two alternative vaccine effectiveness scenarios.

While the microsimulation model does not explicitly model transmission dynamics, herd immunity was approximated by reducing the risk of infection with HPV-16 and HPV-18 for unvaccinated women. Since herd immunity depends upon immunity in the current population of women, most of whom have already been exposed to HPV infections and are above the age range targeted by the vaccine, the effects of herd immunity for the current cohort of 9-year-old girls may be delayed until additional cohorts are vaccinated. **Supplementary Table 13** presents a set of exploratory analyses examining herd immunity effects with extremely optimistic assumptions about the level of protection provided to unvaccinated women (30% reduction in their risk of infection with HPV-16 and HPV-18) and high vaccine coverage levels, with herd immunity beginning to have an effect for a cohort of women when they are 20, 30, 40, or 50 years old.

### Alternative screening assumptions: test characteristics, vaccination age and subsequent screening behavior, disparities

**Supplementary Table 14** demonstrates the effect of changes in cytology sensitivity on preferred screening and vaccination strategies.

Current screening practice is calculated based on the screening frequencies and patterns of women in the United States currently using cervical cytology, at all ages, and assuming no change in future screening behavior. Specifically, using current U.S. screening practice as a comparator, and hypothetically assuming that screening behavior would not change in future birth cohorts, we found pre-adolescent vaccination provides an additional 36% cancer risk reduction. Of importance, this average reduction assumes (1) a homogeneous population where all women are equally likely to benefit from screening and vaccination; (2) the screening behavior of the vaccinated birth cohort would exactly mirror current patterns of screening; (3) screening would not include primary testing with HPV-DNA testing or with combined HPV-DNA testing and cytology. For purposes of comparison to other cost-effectiveness analyses reported in the literature, we include the reduction in lifetime cancer risk, total discounted expected lifetime costs, discounted quality-adjusted life expectancy, and cost-effectiveness ratios for current screening practices combined with vaccination in **Supplementary Table 15**; however, we do not consider this a realistic scenario to simulate accurate vaccine uptake and screening patterns in the future. In addition to the base case in which we balance all prevention strategies by assuming the same achievable coverage rates, and then vary those coverage rates, we also conduct a series of exploratory analyses intended to provide qualitative insight into several alternative scenarios regarding changes in screening behavior in a vaccinated cohorts (at a variety of vaccine coverage levels) depending on whether vaccination is delivered to pre-adolescent females or opportunistically to women aged 21 to 29 years.

**Supplementary Table 16** shows results for an exploratory analysis of the marginal benefits associated with vaccinating women of different ages. This analysis explores the expected incremental benefit associated with opportunistic vaccination of women in their mid to late 20s, rather than a targeted program that covers all pre-adolescents, and the influence of vaccinated women's subsequent screening behavior on overall outcomes. The marginal benefit of vaccinating women in their mid to late 20s is approximately 80% lower than the benefit of pre-adolescent vaccination. To explore the impact of changes in population screening behavior directly or indirectly attributable to the introduction of a type-specific vaccine, we consider the hypothetical scenario that 30% of women would not be screened or would be screened much less frequently (presumably due to misconception they were otherwise protected, or general confusion about cervical cancer screening messages) and that 70% would continue with at least triennial screening. The results of this scenario are shown in the manuscript (**Main Manuscript Figure 2**) for three levels of vaccine coverage (25%, 75% and 100%). The marginal benefit of HPV vaccination is more easily diminished for women in their 20s than for pre-adolescents if regular screening cannot be maintained even at vaccine coverage levels above 75%. Given assumptions about age of vaccine uptake, screening behavior in the context of vaccination, and vaccine coverage, we identify conditions in which the quality-adjusted life expectancy decreases compared to current screening practice.

**Supplementary Table 17** illustrates potential changes in disparities in lifetime cervical cancer risk between racial/ethnic groups as newer prevention strategies are adopted (potentially differentially) across groups. New prevention strategies considered include the use of HPV DNA testing for primary screening for women older than age 35, HPV 16,18 vaccination for pre-adolescent girls, and increases in the percentage of women who are screened every 3 years. One scenario considered, in which there is preferential uptake (75%) of newer prevention strategies by the lowest risk subpopulation (white women) compared with reduced uptake (25%) by racial/ethnic minorities, widens disparities. A second scenario considered, in which there is equal level of uptake (50%) in all women, regardless of racial/ethnic group, of newer prevention strategies, narrows disparities. For both scenarios, screening without vaccination using cytology as the primary screening test for all ages is simulated at combinations of screening frequencies

that are race-/ethnicity-specific. Then, the incremental benefits for each group under each scenario (HPV DNA testing as primary screening, HPV 16,18 vaccination, and being screened every 3 years) are computed.

Several reports have noted the presence of HPV vaccine-induced cross-protection in which the incidence of HPV types not directly targeted by the vaccine was lowered compared to no vaccination. To simulate the potential effect of cross-protection on costs, effects, and incremental cost-effectiveness ratios, we performed exploratory analyses, allowing the HPV vaccine to also reduce the incidence of other high-risk types. The incremental additional percentage reduction of infection reflected a combination of the population prevalence of the high-risk HPV types that are reduced because of cross-protection and the magnitude of reduction observed in the studies (e.g., 25% to 30%).<sup>16</sup> For screening and/or vaccination strategies in the range of \$30,000 per QALY to \$100,000 per QALY, the same strategies appeared on the efficient frontier in the same order as they did without cross-protection. Strategies evaluated using an assumption of the presence of cross-protection were less costly and more effective than those that do not (base case), but these effects were relatively small overall. Of note, since the overall risk of cervical cancer was lowered, the incremental cost-effectiveness ratios associated with more intensive screening actually increased, although differed by only 5 to 10% from the base case.

We examined how HPV vaccination may change the positive predictive value (PPV) of cytology screening in an exploratory analysis. To do so, we modeled cytology screening alone and cytology screening with vaccination starting at age 21 at 2 year screening intervals. Considered how positive predictive value might change for women in 5-year age groups between the ages of 25 and 64. For each health state, we determined the prevalence of women with different cytology test results. The PPV was calculated as the probability of having true CIN2,3 or worse given a positive cytology result. Reductions in the PPV of cytology alone with vaccination were calculated relative to the PPV of cytology alone without vaccination. Shown in **Supplementary Table 18** are the reductions in positive predictive value for each 5-year age group.

We examined the relative impact of changes to HPV DNA test sensitivity and specificity. HPV DNA test characteristics were modeled as the probability of a positive test results given the presence of high-risk HPV DNA (technical sensitivity) and the probability of a negative test results given the absence of high-risk HPV DNA (technical specificity). We also computed the more clinically relevant HPV DNA test characteristics – probability of test positive given the presence of CIN2,3 or worse (clinically relevant sensitivity) and probability of test negative given the absence of CIN2,3 or worse (clinically relevant specificity). These are shown in **Table 1** of the main manuscript. Shown in **Supplementary Table 19 and 20** are the impact of changes to HPV DNA test characteristics on screening and vaccination strategies on the efficient frontier. As sensitivity is lowered, cytology with HPV triage for older women becomes preferred to HPV

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<sup>16</sup> (a) de Sanjosé S, Diaz M, Castellsagué X, Clifford G, Bruni L, Muñoz N, Bosch FX. Worldwide prevalence and genotype distribution of cervical human papillomavirus DNA in women with normal cytology: a meta-analysis. *Lancet Infect Dis.* 2007 Jul;7(7):453-9.

(b) Harper DM, Franco EL, Wheeler CM, Moscicki AB, Romanowski B, Roteli-Martins CM, et al. Sustained efficacy up to 4.5 years of a bivalent L1 virus-like particle vaccine against human papillomavirus types 16 and 18: follow-up from a randomised control trial. *Lancet* 2006;367:1247-55.

(c) Paavonen J, Jenkins D, Bosch FX, Naud P, Salmeron J, Wheeler CM, et al. Efficacy of a prophylactic adjuvanted bivalent L1 virus-like-particle vaccine against infection with human papillomavirus types 16 and 18 in young women: an interim analysis of a phase III double-blind, randomised controlled trial. *Lancet* 2007;369:2161-70.

(d) Cross-protection data for Gardasil submitted to FDA. *AIDS Patient Care STDS* 2007;21:370.

with cytology triage for this age group. However, results are more sensitivity to changes to specificity.



**Supplementary Table 3. Lifetime Cervical Cancer Risk and Reductions in Risk (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Lifetime cervical cancer risk %	Reduction in risk compared to natural history %
	Natural History					2.17 [1.38-2.82]	
None	N/A	N/A	N/A	N/A	Yes	0.54 [0.25-0.91]	74.9 [60.3-87.8]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	0.43 [0.25-0.61]	80.2 [74.2-85.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	0.11 [0.05-0.20]	95.1 [91.9-97.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	0.43 [0.25-0.61]	80.1 [74.1-85.2]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	0.11 [0.05-0.21]	95.1 [91.9-97.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	0.44 [0.25-0.61]	79.9 [73.9-85.1]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	0.11 [0.05-0.21]	95.0 [91.8-97.4]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	0.44 [0.25-0.61]	80.0 [74.1-84.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	0.11 [0.05-0.20]	95.1 [91.8-97.4]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	0.44 [0.25-0.61]	79.9 [74.0-84.8]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	0.11 [0.05-0.21]	95.1 [91.8-97.4]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	0.44 [0.26-0.62]	79.7 [73.8-84.5]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	0.11 [0.05-0.21]	95.0 [91.7-97.4]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	0.45 [0.27-0.62]	79.4 [73.8-83.5]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	0.11 [0.05-0.21]	95.0 [91.7-97.4]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	0.45	79.3

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[0.27-0.62] 0.11	[73.7-83.3] 95.0
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[0.05-0.21] 0.46	[91.7-97.4] 79.1
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[0.27-0.63] 0.11	[73.5-83.2] 94.9
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[0.05-0.21] 0.44	[91.7-97.4] 79.7
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[0.26-0.63] 0.11	[73.6-84.9] 94.9
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[0.05-0.22] 0.45	[91.4-97.3] 79.6
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[0.26-0.63] 0.11	[73.4-84.9] 94.8
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[0.05-0.22] 0.45	[91.4-97.3] 79.4
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[0.27-0.63] 0.11	[73.0-84.8] 94.8
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1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[0.27-0.63] 0.11	[73.4-84.6] 94.9
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1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[0.26-0.63] 0.11	[73.4-84.5] 94.8
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1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[0.27-0.64] 0.11	[73.2-84.1] 94.8
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[0.05-0.22] 0.46	[91.2-97.2] 78.8
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[0.28-0.65] 0.11	[73.0-83.0] 94.8
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[0.05-0.22] 0.47	[91.2-97.3] 78.6
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[0.28-0.66] 0.11	[72.7-82.8] 94.7
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[0.05-0.22] 0.52	[91.2-97.2] 76.3

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[0.30-0.72] 0.12	[69.2-82.4] 94.3
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[0.06-0.24] 0.52	[90.4-97.0] 76.1
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[0.30-0.72] 0.12	[68.9-81.9] 94.2
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[0.06-0.24] 0.54	[90.5-97.0] 75.5
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[0.32-0.74] 0.13	[69.1-80.5] 94.2
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[0.06-0.24] 0.44	[90.4-97.0] 79.8
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1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[0.28-0.64] 0.11	[72.9-83.2] 94.8
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[0.05-0.22] 0.48	[91.2-97.3] 78.1
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[0.28-0.67] 0.11	[70.5-83.8] 94.7
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2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[0.05-0.21] 0.49	[91.6-97.4] 77.3
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[0.29-0.69] 0.12	[69.7-82.7] 94.6
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2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[0.06-0.22] 0.50	[91.2-97.3] 76.9
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2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[0.32-0.73] 0.12	[68.1-80.8] 94.2
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2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[0.06-0.23] 0.67	[90.7-97.1] 69.1
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[0.40-0.93] 0.15	[60.0-76.9] 92.9
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[0.07-0.27] 0.69	[88.6-96.5] 68.3
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[0.41-0.96] 0.16	[58.8-76.2] 92.7
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[0.07-0.28] 0.70	[88.4-96.5] 67.8
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[0.41-0.98] 0.16	[58.8-74.6] 92.7
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[0.07-0.28] 0.50	[88.3-96.5] 77.1
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[0.29-0.71] 0.12	[69.5-83.5] 94.5
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[0.06-0.22] 0.51	[91.2-97.2] 76.8
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[0.29-0.71] 0.12	[69.0-83.0] 94.4
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[0.06-0.23] 0.52	[90.9-97.2] 76.1
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[0.31-0.73] 0.12	[68.3-81.3] 94.3
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[0.06-0.22] 0.57	[90.8-97.2] 73.9
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[0.33-0.81] 0.13	[64.4-81.1] 93.9
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[0.06-0.23] 0.57	[90.0-97.2] 73.6

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[0.33-0.81] 0.13	[64.2-80.7] 93.9
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[0.06-0.23] 0.59	[89.9-97.2] 72.8
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[0.35-0.83] 0.13	[63.3-79.6] 93.8
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[0.06-0.24] 0.57	[89.7-97.1] 73.7
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[0.33-0.81] 0.13	[64.3-80.7] 93.9
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[0.06-0.23] 0.58	[90.0-97.2] 73.5
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[0.34-0.82] 0.13	[64.1-80.3] 93.9
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[0.06-0.23] 0.59	[89.9-97.2] 72.7
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[0.35-0.83] 0.13	[63.3-79.3] 93.8
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[0.06-0.24] 0.58	[89.7-97.1] 73.5
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[0.34-0.82] 0.13	[64.1-79.7] 93.9
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[0.06-0.23] 0.59	[89.9-97.1] 73.0
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[0.35-0.83] 0.13	[63.6-78.8] 93.8
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[0.06-0.23] 0.61	[89.8-97.1] 72.1
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[0.36-0.85] 0.14	[62.8-77.8] 93.7
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[0.06-0.24] 0.60	[89.6-97.0] 72.5
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[0.35-0.85] 0.14	[62.9-80.1] 93.6
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[0.06-0.24] 0.60	[89.6-97.0] 72.3
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[0.35-0.85] 0.14	[62.7-79.8] 93.6
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[0.06-0.24] 0.62	[89.6-97.0] 71.5

3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[0.37-0.87] 0.14	[61.8-78.6] 93.4
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[0.06-0.25] 0.60	[89.4-96.9] 72.4
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[0.35-0.85] 0.14	[62.8-79.8] 93.6
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[0.06-0.24] 0.61	[89.6-97.0] 72.2
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[0.35-0.85] 0.14	[62.7-79.4] 93.5
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[0.06-0.24] 0.62	[89.6-97.0] 71.4
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[0.37-0.87] 0.14	[61.8-78.5] 93.4
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[0.06-0.25] 0.62	[89.4-97.0] 71.5
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[0.37-0.87] 0.14	[61.8-77.6] 93.4
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[0.06-0.25] 0.64	[89.3-96.9] 70.7
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[0.38-0.89] 0.14	[61.0-76.8] 93.3
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[0.06-0.25] 0.84	[89.1-96.9] 61.6
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[0.51-1.17] 0.19	[51.0-70.9] 91.2
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[0.09-0.33] 0.84	[86.4-95.8] 61.4
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[0.51-1.17] 0.19	[50.9-70.7] 91.2
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[0.09-0.33] 0.84	[86.2-95.8] 61.4
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[0.50-1.17] 0.19	[51.0-69.8] 91.3
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[0.08-0.33] 0.59	[86.4-95.8] 72.8
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[0.34-0.85] 0.14	[63.0-80.6] 93.6
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[0.06-0.24] 0.59	[89.6-97.1] 72.7

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[0.34-0.84] 0.14	[63.1-80.1] 93.6
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[0.06-0.24] 0.61	[89.6-97.0] 72.0
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[0.36-0.86] 0.14	[62.4-78.4] 93.5
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[0.06-0.24] 0.77	[89.5-96.9] 64.6
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[0.46-1.08] 0.17	[53.2-73.6] 91.9
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[0.07-0.30] 0.79	[86.9-96.4] 63.9
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[0.48-1.10] 0.18	[52.6-72.7] 91.8
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[0.08-0.31] 0.81	[86.7-96.3] 62.9
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[0.50-1.12] 0.18	[51.7-71.5] 91.7
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[0.08-0.31] 0.80	[86.6-96.2] 63.5
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[0.48-1.12] 0.18	[51.9-72.7] 91.5
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[0.08-0.32] 0.81	[86.4-96.2] 62.9
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[0.49-1.13] 0.18	[51.5-71.8] 91.4
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[0.08-0.32] 0.83	[86.2-96.1] 62.1
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[0.51-1.15] 0.19	[50.8-70.7] 91.3
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[0.08-0.33] 0.77	[86.1-96.1] 64.7
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[0.46-1.07] 0.17	[53.6-73.1] 91.9
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[0.07-0.30] 0.78	[86.9-96.3] 64.2
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[0.47-1.08] 0.18	[53.1-72.2] 91.8
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[0.08-0.30] 0.80	[86.8-96.3] 63.4



5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[0.49-1.10] 0.18	[52.4-71.2] 91.7
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[0.08-0.31] 0.81	[86.7-96.2] 63.0
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[0.48-1.13] 0.18	[51.0-72.5] 91.5
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[0.08-0.32] 0.82	[86.3-96.2] 62.4
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[0.50-1.15] 0.18	[50.6-71.6] 91.4
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[0.08-0.32] 0.84	[86.2-96.1] 61.5
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[0.51-1.17] 0.19	[49.9-70.5] 91.3
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[0.08-0.33] 0.83	[86.0-96.1] 61.9
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[0.50-1.17] 0.19	[49.6-71.5] 91.1
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[0.08-0.33] 0.84	[85.8-96.0] 61.3
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[0.51-1.18] 0.19	[49.3-70.6] 91.1
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[0.08-0.34] 0.86	[85.7-96.0] 60.6
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[0.53-1.20] 0.19	[48.7-69.6] 91.0
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[0.08-0.34] 0.82	[85.6-96.0] 62.3
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[0.50-1.14] 0.19	[50.7-70.9] 91.4
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[0.08-0.32] 0.84	[86.1-96.1] 61.6
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[0.51-1.15] 0.19	[50.1-70.0] 91.3
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[0.08-0.32] 1.08	[85.9-96.0] 50.4
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[0.66-1.48] 0.24	[39.3-61.1] 88.7
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[0.11-0.42] 1.10	[82.7-94.7] 49.4

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[0.68-1.51] 0.25	[38.2-60.2] 88.3
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[0.11-0.43] 1.07	[82.3-94.5] 50.9
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[0.66-1.49] 0.24	[39.7-61.1] 88.8
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[0.11-0.42] 0.80	[83.0-94.8] 63.4
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[0.46-1.12] 0.18	[51.5-73.4] 91.6
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[0.08-0.32] 0.82	[86.4-96.2] 62.1
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[0.49-1.16] 0.19	[49.8-72.0] 91.1
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[0.08-0.33] 0.81	[85.8-96.0] 62.8
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[0.49-1.13] 0.18	[51.0-71.7] 91.5
						[0.08-0.32]	[86.2-96.2]

**Supplementary Table 4. Discounted Lifetime Costs and Discounted Quality-Adjusted Life Expectancies (QALE) (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Cost \$	QALE QALYs
	Natural History					153 [101-203]	26.67212 [26.64543-26.69606]
None	N/A	N/A	N/A	N/A	Yes	534 [515-558]	26.73114 [26.71980-26.73937]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	3,319 [3,075-3,644]	26.74059 [26.73740-26.74271]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	3,529 [3,307-3,889]	26.74558 [26.74420-26.74633]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	3,022 [2,832-3,254]	26.74043 [26.73718-26.74263]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	3,300 [3,129-3,575]	26.74557 [26.74410-26.74633]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	2,806 [2,657-2,986]	26.74018 [26.73679-26.74255]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	3,116 [2,973-3,329]	26.74553 [26.74404-26.74633]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	3,090 [2,841-3,419]	26.74017 [26.73666-26.74253]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	3,309 [3,095-3,670]	26.74553 [26.74416-26.74633]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	2,792 [2,597-3,032]	26.74003 [26.73645-26.74245]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	3,079 [2,916-3,355]	26.74551 [26.74409-26.74632]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	2,576 [2,422-2,765]	26.73976 [26.73594-26.74229]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	2,896 [2,761-3,110]	26.74546 [26.74397-26.74629]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	2,815 [2,567-3,148]	26.73873 [26.73375-26.74189]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	3,046 [2,837-3,406]	26.74535 [26.74390-26.74627]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	2,518	26.73846

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[2,323-2,762] 2,816	[26.73324-26.74178] 26.74532
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[2,659-3,092] 2,302	[26.74380-26.74626] 26.73819
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[2,148-2,494] 2,633	[26.73276-26.74163] 26.74528
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[2,510-2,847] 2,603	[26.74372-26.74625] 26.74039
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[2,419-2,825] 2,858	[26.73700-26.74247] 26.74549
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[2,666-3,125] 2,458	[26.74397-26.74634] 26.74020
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[2,314-2,627] 2,763	[26.73664-26.74237] 26.74545
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[2,615-2,968] 2,362	[26.74387-26.74634] 26.73995
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[2,248-2,499] 2,692	[26.73639-26.74228] 26.74544
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[2,574-2,851] 2,374	[26.74382-26.74629] 26.73996
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[2,184-2,600] 2,637	[26.73633-26.74225] 26.74544
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[2,453-2,906] 2,228	[26.74397-26.74632] 26.73981
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[2,079-2,405] 2,543	[26.73596-26.74218] 26.74541
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[2,403-2,749] 2,133	[26.74389-26.74628] 26.73956
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[2,014-2,270] 2,472	[26.73561-26.74205] 26.74537
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[2,362-2,631] 1,954	[26.74374-26.74622] 26.73823
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1,805-2,135] 2,280	[26.73267-26.74153] 26.74524
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[2,145-2,486] 1,858	[26.74352-26.74628] 26.73795
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[1,739-2,000] 2,209	[26.73224-26.74137] 26.74519
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[2,105-2,368] 2,049	[26.74350-26.74622] 26.73832

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1,973-2,121] 2,438	[26.73419-26.74130] 26.74516
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[2,379-2,482] 1,819	[26.74327-26.74622] 26.73786
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[1,757-1,882] 2,218	[26.73313-26.74094] 26.74506
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[2,167-2,254] 1,545	[26.74326-26.74610] 26.73632
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[1,497-1,599] 1,955	[26.73010-26.74036] 26.74492
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,916-1,986] 2,965	[26.74298-26.74608] 26.74051
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[2,702-3,317] 3,115	[26.73719-26.74262] 26.74549
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[2,798-3,536] 2,558	[26.74405-26.74632] 26.74008
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[2,319-2,856] 2,762	[26.73637-26.74230] 26.74545
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[2,517-3,117] 2,099	[26.74397-26.74630] 26.73848
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1,910-2,329] 2,374	[26.73325-26.74162] 26.74525
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[2,195-2,642] 2,025	[26.74356-26.74622] 26.73919
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1,794-2,348] 2,243	[26.73571-26.74173] 26.74537
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[2,040-2,568] 1,842	[26.74403-26.74625] 26.73885
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[1,656-2,083] 2,120	[26.73509-26.74163] 26.74533
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[1,956-2,381] 1,663	[26.74397-26.74625] 26.73807
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[1,524-1,831] 1,980	[26.73371-26.74115] 26.74522
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1,849-2,171] 1,941	[26.74385-26.74621] 26.73879
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[1,690-2,295] 2,151	[26.73503-26.74158] 26.74531
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[1,939-2,500] 1,672	[26.74397-26.74620] 26.73828

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[1,489-1,902] 1,965	[26.73411-26.74139] 26.74524
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1,813-2,215] 1,549	[26.74386-26.74615] 26.73772
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[1,398-1,730] 1,869	[26.73317-26.74110] 26.74516
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1,740-2,070] 1,786	[26.74371-26.74613] 26.73756
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[1,535-2,143] 2,005	[26.73248-26.74120] 26.74516
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1,796-2,354] 1,518	[26.74372-26.74614] 26.73685
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[1,335-1,752] 1,820	[26.73123-26.74088] 26.74507
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1,674-2,070] 1,394	[26.74356-26.74609] 26.73630
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[1,244-1,579] 1,724	[26.73033-26.74052] 26.74498
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1,605-1,926] 1,533	[26.74340-26.74607] 26.73857
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[1,380-1,730] 1,811	[26.73491-26.74127] 26.74522
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1,656-2,012] 1,445	[26.74372-26.74623] 26.73823
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[1,321-1,593] 1,762	[26.73430-26.74117] 26.74519
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1,637-1,924] 1,369	[26.74370-26.74624] 26.73751
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[1,270-1,485] 1,713	[26.73308-26.74076] 26.74509
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1,614-1,832] 1,423	[26.74360-26.74618] 26.73820
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[1,257-1,641] 1,698	[26.73428-26.74100] 26.74515
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1,539-1,914] 1,297	[26.74358-26.74615] 26.73769
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[1,172-1,438] 1,627	[26.73323-26.74083] 26.74509
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1,513-1,782] 1,242	[26.74356-26.74606] 26.73717

2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[1,139-1,356] 1,590	[26.73226-26.74057] 26.74502
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1,495-1,716] 1,142	[26.74347-26.74606] 26.73627
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1,018-1,288] 1,482	[26.73039-26.74033] 26.74493
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1,372-1,637] 1,088	[26.74334-26.74604] 26.73574
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[985-1,203] 1,446	[26.72958-26.74001] 26.74485
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1,357-1,572] 1,178	[26.74316-26.74605] 26.73351
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1,116-1,243] 1,570	[26.72667-26.73815] 26.74431
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1,520-1,606] 1,044	[26.74223-26.74586] 26.73292
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[993-1,097] 1,442	[26.72605-26.73783] 26.74421
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1,400-1,477] 889	[26.74216-26.74578] 26.73160
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[847-937] 1,297	[26.72310-26.73749] 26.74409
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,264-1,327] 1,858	[26.74195-26.74575] 26.73893
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1,628-2,209] 2,023	[26.73544-26.74142] 26.74527
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,740-2,401] 1,571	[26.74380-26.74624] 26.73845
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[1,357-1,862] 1,791	[26.73461-26.74099] 26.74519
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1,575-2,092] 1,268	[26.74363-26.74614] 26.73689
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1,102-1,490] 1,553	[26.73148-26.74059] 26.74500
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1,398-1,769] 1,436	[26.74345-26.74607] 26.73642
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1,259-1,696] 1,702	[26.73180-26.74036] 26.74490
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[1,551-1,941] 1,330	[26.74303-26.74608] 26.73603

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[1,181-1,534] 1,635	[26.73114-26.74014] 26.74486
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[1,505-1,833] 1,196	[26.74290-26.74605] 26.73485
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[1,085-1,336] 1,534	[26.72908-26.73952] 26.74468
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1,431-1,679] 1,347	[26.74263-26.74598] 26.73606
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[1,164-1,610] 1,618	[26.73151-26.74019] 26.74485
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[1,472-1,858] 1,241	[26.74302-26.74607] 26.73565
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[1,086-1,449] 1,551	[26.73083-26.74004] 26.74480
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1,426-1,751] 1,107	[26.74295-26.74605] 26.73451
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[990-1,251] 1,451	[26.72887-26.73951] 26.74464
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1,352-1,597] 1,327	[26.74268-26.74599] 26.73529
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[1,121-1,639] 1,579	[26.72976-26.73993] 26.74474
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1,413-1,865] 1,115	[26.74296-26.74602] 26.73426
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[967-1,314] 1,440	[26.72791-26.73944] 26.74461
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1,326-1,632] 989	[26.74275-26.74594] 26.73308
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[878-1,130] 1,343	[26.72605-26.73887] 26.74444
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1,255-1,484] 1,096	[26.74251-26.74586] 26.73561
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[978-1,254] 1,409	[26.73081-26.73970] 26.74472
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1,292-1,570] 1,049	[26.74286-26.74601] 26.73528
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[949-1,174] 1,386	[26.73001-26.73949] 26.74469
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1,288-1,516] 987	[26.74272-26.74599] 26.73415



3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[905-1,083] 1,347	[26.72814-26.73893] 26.74452
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1,269-1,442] 1,007	[26.74243-26.74594] 26.73529
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[884-1,169] 1,325	[26.73040-26.73956] 26.74467
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1,214-1,488] 960	[26.74281-26.74601] 26.73493
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[855-1,089] 1,302	[26.72975-26.73944] 26.74462
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1,209-1,434] 898	[26.74270-26.74597] 26.73382
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[817-988] 1,263	[26.72781-26.73895] 26.74446
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1,190-1,355] 844	[26.74249-26.74591] 26.73344
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[743-968] 1,199	[26.72669-26.73873] 26.74443
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1,113-1,324] 787	[26.74250-26.74587] 26.73237
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[710-876] 1,161	[26.72506-26.73825] 26.74427
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1,098-1,250] 848	[26.74231-26.74580] 26.72828
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[795-904] 1,244	[26.71897-26.73497] 26.74332
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1,202-1,278] 759	[26.74053-26.74538] 26.72790
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[712-814] 1,160	[26.71885-26.73473] 26.74327
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1,124-1,193] 655	[26.74059-26.74537] 26.72679
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[616-703] 1,064	[26.71628-26.73462] 26.74316
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,035-1,089] 1,389	[26.74042-26.74534] 26.73619
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1,187-1,699] 1,595	[26.73141-26.73975] 26.74478
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,362-1,937] 1,171	[26.74294-26.74604] 26.73587

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[992-1,427] 1,424	[26.73110-26.73968] 26.74473
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1,250-1,696] 948	[26.74281-26.74601] 26.73442
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[811-1,141] 1,255	[26.72855-26.73930] 26.74455
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1,131-1,448] 988	[26.74273-26.74594] 26.73000
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[855-1,188] 1,290	[26.72300-26.73626] 26.74366
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[1,180-1,468] 882	[26.74111-26.74563] 26.72886
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[781-1,021] 1,222	[26.72104-26.73581] 26.74351
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[1,135-1,358] 812	[26.74091-26.74551] 26.72742
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[733-916] 1,169	[26.71855-26.73495] 26.74331
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1,097-1,273] 971	[26.74056-26.74540] 26.72983
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[817-1,205] 1,258	[26.72319-26.73620] 26.74355
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[1,140-1,462] 846	[26.74083-26.74557] 26.72885
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[728-1,005] 1,182	[26.72134-26.73584] 26.74345
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1,090-1,332] 767	[26.74065-26.74554] 26.72752
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[675-885] 1,124	[26.71904-26.73513] 26.74327
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1,050-1,239] 961	[26.74038-26.74546] 26.72948
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[793-1,224] 1,239	[26.72174-26.73629] 26.74356
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1,108-1,469] 812	[26.74102-26.74556] 26.72842
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[689-988] 1,146	[26.71984-26.73579] 26.74343
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1,055-1,306] 727	[26.74084-26.74548] 26.72710

5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[631-855] 1,086	[26.71729-26.73503] 26.74326
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1,014-1,209] 747	[26.74055-26.74534] 26.72887
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[660-861] 1,089	[26.72165-26.73544] 26.74342
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1,010-1,199] 700	[26.74074-26.74548] 26.72782
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[630-787] 1,064	[26.71975-26.73507] 26.74329
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1,003-1,147] 672	[26.74052-26.74541] 26.72654
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[611-748] 1,046	[26.71741-26.73433] 26.74311
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[995-1,114] 704	[26.74024-26.74533] 26.72877
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[609-839] 1,039	[26.72163-26.73547] 26.74334
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[957-1,169] 647	[26.74043-26.74552] 26.72781
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[573-742] 1,011	[26.71990-26.73501] 26.74322
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[950-1,100] 615	[26.74034-26.74545] 26.72660
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[555-695] 991	[26.71778-26.73439] 26.74307
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[939-1,059] 598	[26.74012-26.74540] 26.72733
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[522-700] 962	[26.71845-26.73491] 26.74322
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[900-1,058] 562	[26.74044-26.74539] 26.72609
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[501-638] 942	[26.71596-26.73420] 26.74305
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[894-1,011] 594	[26.74014-26.74526] 26.71960
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[548-646] 989	[26.70665-26.72905] 26.74161
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[955-1,020] 531	[26.73783-26.74471] 26.71909

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[489-583] 930	[26.70618-26.72865] 26.74144
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[901-958] 471	[26.73757-26.74459] 26.71857
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[435-521] 875	[26.70423-26.72862] 26.74142
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[851-895] 980	[26.73755-26.74461] 26.72987
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[814-1,227] 1,230	[26.72321-26.73581] 26.74354
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,056-1,493] 807	[26.74087-26.74556] 26.72930
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[673-1,003] 1,101	[26.72231-26.73560] 26.74340
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[978-1,308] 668	[26.74048-26.74555] 26.72831
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[566-819] 999	[26.72032-26.73539] 26.74334
						[910-1,146]	[26.74061-26.74548]

**Supplementary Table 5. Discounted Life Expectancies (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Life expectancy Years
	Natural History					29.29524 [29.27145-29.31664]
None	N/A	N/A	N/A	N/A	Yes	29.34771 [29.33776-29.35506]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.35737 [29.35527-29.35888]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.36074 [29.35974-29.36124]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.35725 [29.35512-29.35881]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.36073 [29.35969-29.36124]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.35706 [29.35482-29.35875]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.36070 [29.35964-29.36124]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.35701 [29.35464-29.35870]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.36069 [29.35973-29.36123]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.35691 [29.35450-29.35866]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.36068 [29.35968-29.36122]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.35671 [29.35408-29.35853]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.36063 [29.35957-29.36119]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.35577 [29.35209-29.35825]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.36053 [29.35951-29.36118]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.35554 [29.35167-29.35819]

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	29.36050 [29.35943-29.36118]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	29.35533 [29.35128-29.35808]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	29.36047 [29.35936-29.36116]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	29.35721 [29.35491-29.35869]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	29.36067 [29.35960-29.36124]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	29.35706 [29.35459-29.35857]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	29.36064 [29.35952-29.36123]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	29.35687 [29.35445-29.35854]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	29.36063 [29.35947-29.36120]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	29.35685 [29.35433-29.35851]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	29.36062 [29.35959-29.36122]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	29.35672 [29.35405-29.35845]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	29.36060 [29.35950-29.36119]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	29.35654 [29.35376-29.35835]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	29.36056 [29.35940-29.36113]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	29.35532 [29.35114-29.35797]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	29.36043 [29.35922-29.36119]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	29.35512 [29.35081-29.35788]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	29.36040 [29.35918-29.36114]
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	29.35565 [29.35288-29.35788]

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	29.36043 [29.35910-29.36117]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	29.35529 [29.35200-29.35755]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	29.36033 [29.35905-29.36105]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	29.35395 [29.34933-29.35713]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	29.36020 [29.35883-29.36104]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	29.35728 [29.35504-29.35873]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	29.36065 [29.35966-29.36122]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	29.35695 [29.35431-29.35852]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	29.36062 [29.35963-29.36120]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	29.35555 [29.35159-29.35800]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	29.36043 [29.35926-29.36112]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.35636 [29.35402-29.35820]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.36058 [29.35962-29.36119]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.35608 [29.35355-29.35813]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.36055 [29.35954-29.36119]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.35544 [29.35239-29.35772]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.36047 [29.35946-29.36116]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.35600 [29.35340-29.35809]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.36052 [29.35957-29.36116]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.35559 [29.35266-29.35797]

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.36047 [29.35952-29.36112]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.35515 [29.35192-29.35775]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.36040 [29.35942-29.36107]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.35493 [29.35117-29.35777]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.36039 [29.35938-29.36111]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.35434 [29.35016-29.35750]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	29.36031 [29.35923-29.36105]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	29.35391 [29.34950-29.35721]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	29.36024 [29.35909-29.36103]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	29.35587 [29.35331-29.35784]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	29.36047 [29.35939-29.36118]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	29.35559 [29.35291-29.35778]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	29.36044 [29.35936-29.36118]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	29.35500 [29.35188-29.35742]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	29.36036 [29.35926-29.36114]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	29.35554 [29.35279-29.35762]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	29.36039 [29.35930-29.36110]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	29.35513 [29.35195-29.35759]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	29.36034 [29.35931-29.36105]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	29.35470 [29.35112-29.35730]



2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	29.36029 [29.35924-29.36101]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	29.35386 [29.34944-29.35706]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	29.36020 [29.35906-29.36100]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	29.35345 [29.34887-29.35678]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	29.36014 [29.35890-29.36101]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	29.35185 [29.34678-29.35533]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	29.35976 [29.35827-29.36090]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	29.35135 [29.34623-29.35512]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	29.35965 [29.35820-29.36081]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	29.35019 [29.34381-29.35472]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	29.35955 [29.35798-29.36081]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	29.35615 [29.35356-29.35794]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	29.36051 [29.35947-29.36119]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	29.35575 [29.35302-29.35759]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	29.36044 [29.35938-29.36112]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	29.35439 [29.35040-29.35730]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	29.36026 [29.35916-29.36106]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.35420 [29.35072-29.35714]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.36022 [29.35892-29.36108]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.35388 [29.35043-29.35697]

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.36018 [29.35881-29.36106]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.35291 [29.34879-29.35652]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.36004 [29.35859-29.36101]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.35387 [29.35053-29.35700]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.36017 [29.35894-29.36106]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.35354 [29.35015-29.35685]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.36013 [29.35889-29.36103]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.35261 [29.34862-29.35646]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.35999 [29.35869-29.36100]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.35322 [29.34910-29.35680]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.36008 [29.35888-29.36104]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.35236 [29.34761-29.35639]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	29.35998 [29.35867-29.36097]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	29.35141 [29.34613-29.35595]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	29.35984 [29.35847-29.36089]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	29.35355 [29.34992-29.35667]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	29.36008 [29.35878-29.36103]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	29.35328 [29.34954-29.35646]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	29.36005 [29.35866-29.36101]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	29.35234 [29.34797-29.35601]

3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	29.35991 [29.35843-29.36098]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	29.35327 [29.34972-29.35651]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	29.36003 [29.35876-29.36101]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	29.35297 [29.34928-29.35640]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	29.35999 [29.35866-29.36097]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	29.35206 [29.34768-29.35602]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	29.35986 [29.35853-29.36095]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	29.35169 [29.34662-29.35579]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	29.35982 [29.35845-29.36091]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	29.35083 [29.34532-29.35541]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	29.35970 [29.35830-29.36085]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	29.34749 [29.34051-29.35275]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	29.35892 [29.35677-29.36050]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	29.34717 [29.34050-29.35245]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	29.35890 [29.35695-29.36052]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	29.34618 [29.33801-29.35246]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	29.35879 [29.35670-29.36047]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	29.35402 [29.35042-29.35671]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	29.36013 [29.35885-29.36104]
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	29.35376 [29.35021-29.35660]

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	29.36007 [29.35872-29.36103]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	29.35251 [29.34813-29.35630]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	29.35992 [29.35864-29.36098]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.34900 [29.34389-29.35380]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.35922 [29.35723-29.36071]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.34801 [29.34223-29.35344]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.35908 [29.35706-29.36060]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.34677 [29.34007-29.35269]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.35891 [29.35675-29.36051]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.34878 [29.34363-29.35380]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.35912 [29.35707-29.36068]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.34793 [29.34232-29.35352]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.35904 [29.35693-29.36066]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.34679 [29.34037-29.35295]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.35888 [29.35668-29.36059]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.34842 [29.34256-29.35381]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.35912 [29.35722-29.36068]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.34751 [29.34103-29.35339]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	29.35900 [29.35705-29.36061]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	29.34637 [29.33878-29.35279]

5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	29.35886 [29.35686-29.36049]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	29.34803 [29.34278-29.35310]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	29.35902 [29.35692-29.36058]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	29.34713 [29.34113-29.35279]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	29.35890 [29.35675-29.36051]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	29.34601 [29.33908-29.35214]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	29.35874 [29.35649-29.36045]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	29.34791 [29.34242-29.35321]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	29.35896 [29.35675-29.36065]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	29.34708 [29.34119-29.35285]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	29.35885 [29.35669-29.36058]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	29.34603 [29.33935-29.35235]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	29.35872 [29.35648-29.36054]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	29.34661 [29.33991-29.35268]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	29.35882 [29.35672-29.36054]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	29.34552 [29.33764-29.35209]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	29.35868 [29.35651-29.36041]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	29.33990 [29.32965-29.34753]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	29.35744 [29.35435-29.35991]
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	29.33939 [29.32916-29.34730]

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	29.35730 [29.35428-29.35987]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	29.33890 [29.32734-29.34715]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	29.35724 [29.35409-29.35987]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	29.34890 [29.34375-29.35343]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	29.35912 [29.35707-29.36067]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	29.34835 [29.34282-29.35331]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	29.35901 [29.35681-29.36067]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	29.34745 [29.34138-29.35309]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	29.35893 [29.35694-29.36061]

**Supplementary Table 6. Reduction in Lifetime Cervical Cancer Risk for Strategies if HPV Vaccination is 75% Effective at Preventing HPV-16 and HPV-18 Infections (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Reduction in risk compared to natural history %
None	Natural History N/A	N/A	N/A	N/A	Yes	34.1 [-3.6-58.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	80.2 [74.2-85.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	86.5 [79.5-91.0]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	80.1 [74.1-85.2]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	86.5 [79.4-91.0]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	79.9 [73.9-85.1]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	86.4 [79.2-90.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	80.0 [74.1-84.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	86.4 [79.4-91.0]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	79.9 [74.0-84.8]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	86.4 [79.4-90.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	79.7 [73.8-84.5]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	86.3 [79.1-90.9]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	79.4 [73.8-83.5]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	86.2 [79.0-90.8]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	79.3 [73.7-83.3]

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	86.1 [78.8-90.8]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	79.1 [73.5-83.2]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	86.0 [78.6-90.7]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	79.7 [73.6-84.9]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	86.1 [78.5-90.7]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	79.6 [73.4-84.9]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	86.1 [78.5-90.6]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	79.4 [73.0-84.8]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	86.0 [78.2-90.5]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	79.5 [73.4-84.6]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	86.1 [78.2-90.8]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	79.5 [73.4-84.5]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	86.0 [78.3-90.7]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	79.2 [73.2-84.1]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	85.9 [78.1-90.5]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	78.8 [73.0-83.0]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	85.7 [78.1-90.4]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	78.6 [72.7-82.8]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	85.6 [77.8-90.4]
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	76.3 [69.2-82.4]



1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	84.0 [75.2-89.5]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	76.1 [68.9-81.9]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	83.8 [75.4-89.4]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	75.5 [69.1-80.5]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	83.6 [75.1-89.1]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	79.8 [73.4-84.9]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	86.1 [78.5-90.6]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	79.6 [73.6-84.5]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	86.1 [78.3-90.7]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	78.9 [72.9-83.2]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	85.8 [78.1-90.5]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	78.1 [70.5-83.8]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	85.1 [77.6-90.0]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	77.9 [70.3-83.4]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	85.1 [77.5-90.0]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	77.3 [69.7-82.7]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	84.7 [76.9-89.8]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	77.7 [70.0-83.4]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	85.0 [77.4-89.9]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	77.4 [69.6-82.9]

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	84.8 [77.3-89.8]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	77.0 [69.2-82.5]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	84.6 [76.8-89.7]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	77.2 [69.5-82.2]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	84.7 [77.0-89.8]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	76.8 [69.2-81.6]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	84.6 [76.7-89.7]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	76.4 [68.8-81.1]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	84.3 [76.3-89.6]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	76.9 [69.3-83.1]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	84.3 [76.1-89.3]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	76.7 [69.0-82.7]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	84.3 [76.1-89.4]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	76.2 [68.6-82.0]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	84.0 [75.6-89.1]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	76.7 [69.0-82.7]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	84.2 [76.2-89.4]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	76.3 [68.6-82.0]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	84.1 [76.0-89.3]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	76.0 [68.1-81.6]

2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	83.9 [75.7-89.2]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	75.7 [68.1-80.8]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	83.8 [75.6-89.1]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	75.4 [67.7-80.3]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	83.6 [75.2-88.9]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	69.1 [60.0-76.9]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	79.2 [67.9-86.2]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	68.3 [58.8-76.2]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	78.8 [67.8-86.0]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	67.8 [58.8-74.6]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	78.6 [67.7-86.1]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	77.1 [69.5-83.5]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	84.4 [76.4-89.4]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	76.8 [69.0-83.0]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	84.3 [76.4-89.3]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	76.1 [68.3-81.3]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	84.0 [75.9-89.1]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	73.9 [64.4-81.1]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	82.4 [73.6-88.4]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	73.6 [64.2-80.7]

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	82.3 [73.4-88.4]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	72.8 [63.3-79.6]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	81.9 [72.8-88.0]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	73.7 [64.3-80.7]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	82.4 [73.5-88.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	73.5 [64.1-80.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	82.3 [73.3-88.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	72.7 [63.3-79.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	81.8 [72.6-88.0]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	73.5 [64.1-79.7]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	82.3 [72.9-88.3]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	73.0 [63.6-78.8]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	82.1 [72.6-88.1]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	72.1 [62.8-77.8]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	81.6 [71.7-87.8]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	72.5 [62.9-80.1]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	81.5 [72.0-87.6]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	72.3 [62.7-79.8]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	81.5 [71.9-87.6]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	71.5 [61.8-78.6]

3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	81.0 [71.2-87.3]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	72.4 [62.8-79.8]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	81.5 [71.9-87.5]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	72.2 [62.7-79.4]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	81.4 [71.7-87.4]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	71.4 [61.8-78.5]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	80.9 [71.0-87.3]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	71.5 [61.8-77.6]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	81.0 [70.9-87.2]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	70.7 [61.0-76.8]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	80.6 [70.0-87.0]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	61.6 [51.0-70.9]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	74.3 [60.9-82.8]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	61.4 [50.9-70.7]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	74.2 [60.6-82.7]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	61.4 [51.0-69.8]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	74.3 [60.2-83.2]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	72.8 [63.0-80.6]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	81.6 [72.3-87.6]
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	72.7 [63.1-80.1]

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	81.6 [72.1-87.6]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	72.0 [62.4-78.4]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	81.3 [71.3-87.5]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	64.6 [53.2-73.6]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	76.3 [63.8-84.1]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	63.9 [52.6-72.7]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	75.9 [63.3-83.9]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	62.9 [51.7-71.5]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	75.4 [62.2-83.4]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	63.5 [51.9-72.7]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	75.4 [62.2-83.4]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	62.9 [51.5-71.8]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	75.1 [61.8-83.3]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	62.1 [50.8-70.7]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	74.7 [61.2-82.9]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	64.7 [53.6-73.1]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	76.4 [64.0-84.4]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	64.2 [53.1-72.2]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	76.2 [63.6-84.2]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	63.4 [52.4-71.2]

5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	75.7 [62.9-83.9]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	63.0 [51.0-72.5]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	75.2 [62.0-83.3]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	62.4 [50.6-71.6]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	74.9 [61.6-83.1]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	61.5 [49.9-70.5]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	74.4 [60.7-82.7]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	61.9 [49.6-71.5]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	74.3 [60.7-82.6]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	61.3 [49.3-70.6]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	74.1 [60.3-82.4]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	60.6 [48.7-69.6]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	73.7 [59.7-82.2]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	62.3 [50.7-70.9]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	74.9 [61.9-83.1]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	61.6 [50.1-70.0]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	74.5 [61.1-82.9]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	50.4 [39.3-61.1]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	67.0 [49.3-77.5]
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	49.4 [38.2-60.2]

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Supplementary Appendix

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	66.3 [48.5-76.8]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	50.9 [39.7-61.1]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	67.4 [49.7-77.8]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	63.4 [51.5-73.4]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	75.4 [62.4-83.5]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	62.1 [49.8-72.0]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	74.4 [60.9-82.6]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	62.8 [51.0-71.7]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	75.2 [62.3-83.3]



**Supplementary Table 7. Costs and Quality-Adjusted Life Expectancy (QALE) if HPV Vaccination is 75% Effective at Preventing HPV-16 and HPV-18 Infections (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Lifetime costs \$	QALE QALYs
	Natural History					153 [101-203]	26.67212 [26.64543-26.69606]
None	N/A	N/A	N/A	N/A	Yes	595 [555-642]	26.70181 [26.67903-26.72102]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	3319 [3075-3644]	26.74059 [26.73740-26.74271]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	3656 [3462-3972]	26.74298 [26.74075-26.74468]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	3022 [2832-3254]	26.74043 [26.73718-26.74263]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	3402 [3256-3643]	26.74291 [26.74060-26.74464]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	2806 [2657-2986]	26.74018 [26.73679-26.74255]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	3204 [3090-3389]	26.74276 [26.74032-26.74457]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	3090 [2841-3419]	26.74017 [26.73666-26.74253]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	3433 [3234-3753]	26.74281 [26.74051-26.74454]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	2792 [2597-3032]	26.74003 [26.73645-26.74245]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	3178 [3027-3424]	26.74275 [26.74042-26.74454]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	2576 [2422-2765]	26.73976 [26.73594-26.74229]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	2981 [2864-3170]	26.74259 [26.74010-26.74443]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	2815 [2567-3148]	26.73873 [26.73375-26.74189]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	3166 [2970-3487]	26.74222 [26.73948-26.74429]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	2518	26.73846

1 yr	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[2323-2762] 2911	[26.73324-26.74178] 26.74208
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[2763-3159] 2302	[26.73917-26.74424] 26.73819
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[2148-2494] 2714	[26.73276-26.74163] 26.74194
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[2600-2905] 2603	[26.73894-26.74416] 26.74039
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[2419-2825] 2965	[26.73700-26.74247] 26.74284
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[2813-3197] 2458	[26.74041-26.74463] 26.74020
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[2314-2627] 2852	[26.73664-26.74237] 26.74273
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[2730-3028] 2362	[26.74016-26.74459] 26.73995
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[2248-2499] 2771	[26.73639-26.74228] 26.74261
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[2668-2904] 2374	[26.74009-26.74453] 26.73996
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[2184-2600] 2742	[26.73633-26.74225] 26.74266
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[2590-2977] 2228	[26.74021-26.74449] 26.73981
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[2079-2405] 2629	[26.73596-26.74218] 26.74257
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[2514-2808] 2133	[26.74006-26.74443] 26.73956
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[2014-2270] 2547	[26.73561-26.74205] 26.74243
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[2453-2685] 1954	[26.73987-26.74431] 26.73823
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1805-2135] 2362	[26.73267-26.74153] 26.74192
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[2250-2543] 1858	[26.73896-26.74411] 26.73795
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[1739-2000] 2281	[26.73224-26.74137] 26.74178
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[2193-2420] 2049	[26.73865-26.74405] 26.73832

1 yr	trriage Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1973-2121] 2488	[26.73419-26.74130] 26.74158
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[2424-2540] 1819	[26.73842-26.74392] 26.73786
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[1757-1882] 2264	[26.73313-26.74094] 26.74135
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[2210-2316] 1545	[26.73822-26.74380] 26.73632
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[1497-1599] 1998	[26.73010-26.74036] 26.74074
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1954-2044] 2965	[26.73705-26.74340] 26.74051
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[2702-3317] 3258	[26.73719-26.74262] 26.74287
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[3024-3628] 2558	[26.74044-26.74469] 26.74008
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[2319-2856] 2887	[26.73637-26.74230] 26.74271
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[2683-3200] 2099	[26.74018-26.74454] 26.73848
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1910-2329] 2475	[26.73325-26.74162] 26.74204
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[2326-2711] 2025	[26.73911-26.74414] 26.73919
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1794-2348] 2367	[26.73571-26.74173] 26.74213
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[2189-2652] 1842	[26.73962-26.74416] 26.73885
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[1656-2083] 2222	[26.73509-26.74163] 26.74199
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[2082-2451] 1663	[26.73922-26.74409] 26.73807
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[1524-1831] 2065	[26.73371-26.74115] 26.74156
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1961-2231] 1941	[26.73840-26.74386] 26.73879
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[1690-2295] 2278	[26.73503-26.74158] 26.74200
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[2081-2587] 1672	[26.73936-26.74413] 26.73828

2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[1489-1902] 2062	[26.73411-26.74139] 26.74178
2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1924-2283] 1549	[26.73891-26.74402] 26.73772
2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[1398-1730] 1954	[26.73317-26.74110] 26.74149
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1843-2131] 1786	[26.73841-26.74393] 26.73756
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[1535-2143] 2129	[26.73248-26.74120] 26.74149
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1933-2439] 1518	[26.73843-26.74391] 26.73685
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[1335-1752] 1913	[26.73123-26.74088] 26.74116
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1777-2137] 1394	[26.73779-26.74369] 26.73630
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[1244-1579] 1806	[26.73033-26.74052] 26.74084
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1697-1985] 1533	[26.73726-26.74352] 26.73857
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[1380-1730] 1909	[26.73491-26.74127] 26.74174
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1780-2078] 1445	[26.73901-26.74392] 26.73823
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[1321-1593] 1846	[26.73430-26.74117] 26.74159
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1739-1982] 1369	[26.73856-26.74384] 26.73751
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[1270-1485] 1785	[26.73308-26.74076] 26.74119
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1699-1887] 1423	[26.73789-26.74357] 26.73820
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[1257-1641] 1798	[26.73428-26.74100] 26.74163
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1668-1982] 1297	[26.73871-26.74377] 26.73769
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[1172-1438] 1706	[26.73323-26.74083] 26.74141
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1609-1838] 1242	[26.73826-26.74368] 26.73717

2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[1139-1356] 1662	[26.73226-26.74057] 26.74113
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1580-1767] 1142	[26.73786-26.74360] 26.73627
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1018-1288] 1558	[26.73039-26.74033] 26.74079
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1466-1692] 1088	[26.73718-26.74345] 26.73574
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[985-1203] 1514	[26.72958-26.74001] 26.74048
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1437-1621] 1178	[26.73674-26.74327] 26.73351
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1116-1243] 1619	[26.72667-26.73815] 26.73857
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1560-1669] 1044	[26.73319-26.74218] 26.73292
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[993-1097] 1490	[26.72605-26.73783] 26.73839
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1438-1541] 889	[26.73329-26.74203] 26.73160
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[847-937] 1341	[26.72310-26.73749] 26.73785
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1298-1389] 1858	[26.73223-26.74184] 26.73893
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1628-2209] 2158	[26.73544-26.74142] 26.74193
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1939-2468] 1571	[26.73923-26.74402] 26.73845
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[1357-1862] 1909	[26.73461-26.74099] 26.74173
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1732-2161] 1268	[26.73882-26.74389] 26.73689
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1102-1490] 1649	[26.73148-26.74059] 26.74107
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1521-1835] 1436	[26.73773-26.74355] 26.73642
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1259-1696] 1806	[26.73180-26.74036] 26.74050
3 yrs	Cytology with HPV	18	Combination HPV / Cytology	30	No	[1676-2010] 1330	[26.73713-26.74339] 26.73603

3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	30	Yes	[1181-1534] 1725	[26.73114-26.74014] 26.74033
3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	35	No	[1617-1897] 1196	[26.73671-26.74328] 26.73485
3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	35	Yes	[1085-1336] 1610	[26.72908-26.73952] 26.73968
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	25	No	[1526-1734] 1347	[26.73553-26.74302] 26.73606
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	25	Yes	[1164-1610] 1720	[26.73151-26.74019] 26.74035
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	30	No	[1585-1927] 1241	[26.73695-26.74338] 26.73565
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	30	Yes	[1086-1449] 1639	[26.73083-26.74004] 26.74018
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	35	No	[1527-1815] 1107	[26.73653-26.74331] 26.73451
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	35	Yes	[990-1251] 1525	[26.72887-26.73951] 26.73955
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	25	No	[1444-1651] 1327	[26.73528-26.74298] 26.73529
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	25	Yes	[1121-1639] 1688	[26.72976-26.73993] 26.74005
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	30	No	[1532-1929] 1115	[26.73640-26.74315] 26.73426
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	30	Yes	[967-1314] 1522	[26.72791-26.73944] 26.73957
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	35	No	[1417-1692] 989	[26.73555-26.74294] 26.73308
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	35	Yes	[878-1130] 1414	[26.72605-26.73887] 26.73891
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	25	No	[1338-1536] 1096	[26.73443-26.74264] 26.73561
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	25	Yes	[978-1254] 1493	[26.73081-26.73970] 26.74001
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	30	No	[1394-1618] 1049	[26.73639-26.74295] 26.73528
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	30	Yes	[949-1174] 1461	[26.73001-26.73949] 26.73988
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	35	No	[1375-1569] 987	[26.73587-26.74293] 26.73415

3 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[905-1083] 1412	[26.72814-26.73893] 26.73923
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1344-1494] 1007	[26.73483-26.74265] 26.73529
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[884-1169] 1407	[26.73040-26.73956] 26.73986
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1313-1531] 960	[26.73615-26.74303] 26.73493
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[855-1089] 1376	[26.72975-26.73944] 26.73970
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1295-1480] 898	[26.73576-26.74296] 26.73382
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[817-988] 1327	[26.72781-26.73895] 26.73909
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1263-1405] 844	[26.73457-26.74265] 26.73344
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[743-968] 1267	[26.72669-26.73873] 26.73906
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1193-1369] 787	[26.73469-26.74255] 26.73237
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[710-876] 1222	[26.72506-26.73825] 26.73845
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1163-1295] 848	[26.73368-26.74224] 26.72828
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[795-904] 1292	[26.71897-26.73497] 26.73542
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1240-1341] 759	[26.72827-26.74034] 26.72790
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[712-814] 1207	[26.71885-26.73473] 26.73526
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1160-1257] 655	[26.72780-26.74043] 26.72679
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[616-703] 1108	[26.71628-26.73462] 26.73479
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1069-1155] 1389	[26.72744-26.74012] 26.73619
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1187-1699] 1713	[26.73141-26.73975] 26.74025
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1529-1996] 1171	[26.73663-26.74306] 26.73587

3 yrs	trriage HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[992-1427] 1529	[26.73110-26.73968] 26.74011
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1386-1749] 948	[26.73652-26.74310] 26.73442
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[811-1141] 1341	[26.72855-26.73930] 26.73951
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1238-1493] 988	[26.73545-26.74278] 26.73000
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[855-1188] 1379	[26.72300-26.73626] 26.73656
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[1281-1533] 882	[26.73120-26.74107] 26.72886
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[781-1021] 1297	[26.72104-26.73581] 26.73602
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[1220-1414] 812	[26.73014-26.74084] 26.72742
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[733-916] 1237	[26.71855-26.73495] 26.73526
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1172-1324] 971	[26.72867-26.74046] 26.72983
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[817-1205] 1353	[26.72319-26.73620] 26.73638
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[1243-1524] 846	[26.73066-26.74104] 26.72885
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[728-1005] 1259	[26.72134-26.73584] 26.73592
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1179-1389] 767	[26.72966-26.74084] 26.72752
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[675-885] 1193	[26.71904-26.73513] 26.73522
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1129-1291] 961	[26.72841-26.74057] 26.72948
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[793-1224] 1336	[26.72174-26.73629] 26.73641
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1213-1532] 812	[26.73032-26.74091] 26.72842
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[689-988] 1224	[26.71984-26.73579] 26.73590
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1141-1364] 727	[26.72941-26.74064] 26.72710



5 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[631-855] 1154	[26.71729-26.73503] 26.73521
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1090-1261] 747	[26.72822-26.74028] 26.72887
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[660-861] 1161	[26.72165-26.73544] 26.73587
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1087-1251] 700	[26.73006-26.74066] 26.72782
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[630-787] 1128	[26.71975-26.73507] 26.73537
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1068-1201] 672	[26.72905-26.74044] 26.72654
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[611-748] 1106	[26.71741-26.73433] 26.73468
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1054-1165] 704	[26.72770-26.74010] 26.72877
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[609-839] 1114	[26.72163-26.73547] 26.73573
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1039-1211] 647	[26.72959-26.74059] 26.72781
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[573-742] 1076	[26.71990-26.73501] 26.73527
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1016-1149] 615	[26.72860-26.74042] 26.72660
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[555-695] 1051	[26.71778-26.73439] 26.73463
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1001-1110] 598	[26.72749-26.74017] 26.72733
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[522-700] 1027	[26.71845-26.73491] 26.73521
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[967-1103] 562	[26.72835-26.74018] 26.72609
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[501-638] 1000	[26.71596-26.73420] 26.73455
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[951-1061] 594	[26.72717-26.73986] 26.71960
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[548-646] 1039	[26.70665-26.72905] 26.73013
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[993-1085] 531	[26.72003-26.73719] 26.71909

U.S. Cervical Cancer Prevention

Supplementary Appendix

5 yrs	trriage Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[489-583] 979	[26.70618-26.72865] 26.72984
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[938-1028] 471	[26.71925-26.73714] 26.71857
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[435-521] 922	[26.70423-26.72862] 26.72972
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[886-970] 980	[26.71917-26.73682] 26.72987
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[814-1227] 1331	[26.72321-26.73581] 26.73630
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1185-1545] 807	[26.73068-26.74083] 26.72930
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[673-1003] 1189	[26.72231-26.73560] 26.73593
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1084-1355] 668	[26.72984-26.74072] 26.72831
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[566-819] 1075	[26.72032-26.73539] 26.73569
						[996-1187]	[26.72922-26.74043]

**Supplementary Table 8. Discounted Life Expectancy if HPV Vaccination is 75% Effective at Preventing HPV-16 and HPV-18 Infections (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Life expectancy years
	Natural History					29.29524 [29.27145-29.31664]
None	N/A	N/A	N/A	N/A	Yes	29.32172 [29.30161-29.33871]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.35737 [29.35527-29.35888]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.35900 [29.35760-29.36012]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.35725 [29.35512-29.35881]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.35895 [29.35751-29.36010]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.35706 [29.35482-29.35875]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.35883 [29.35728-29.36005]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.35701 [29.35464-29.35870]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.35885 [29.35741-29.36003]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.35691 [29.35450-29.35866]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.35881 [29.35733-29.36002]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.35671 [29.35408-29.35853]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.35868 [29.35709-29.35995]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.35577 [29.35209-29.35825]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.35834 [29.35649-29.35983]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.35554

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.35167-29.35819] 29.35822
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35625-29.35981] 29.35533
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.35128-29.35808] 29.35812
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35606-29.35976] 29.35721
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.35491-29.35869] 29.35888
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35738-29.36003] 29.35706
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.35459-29.35857] 29.35880
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35710-29.36005] 29.35687
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.35445-29.35854] 29.35871
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35701-29.36003] 29.35685
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.35433-29.35851] 29.35872
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35698-29.35994] 29.35672
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.35405-29.35845] 29.35865
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35697-29.35990] 29.35654
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.35376-29.35835] 29.35854
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35685-29.35981] 29.35532
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.35114-29.35797] 29.35807
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35598-29.35966] 29.35512
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.35081-29.35788] 29.35798
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35577-29.35963] 29.35565

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.35288-29.35788] 29.35796
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.35587-29.35958] 29.35529
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.35200-29.35755] 29.35775
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.35569-29.35943] 29.35395
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.34933-29.35713] 29.35723
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.35461-29.35923] 29.35728
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35504-29.35873] 29.35890
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35726-29.36009] 29.35695
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35431-29.35852] 29.35876
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35707-29.35998] 29.35555
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.35159-29.35800] 29.35818
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35617-29.35972] 29.35636
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.35402-29.35820] 29.35838
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.35681-29.35975] 29.35608
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.35355-29.35813] 29.35826
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.35651-29.35970] 29.35544
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.35239-29.35772] 29.35791
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.35578-29.35958] 29.35600
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.35340-29.35809] 29.35826
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.35657-29.35978] 29.35559

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.35266-29.35797] 29.35809
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.35620-29.35969] 29.35515
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.35192-29.35775] 29.35786
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.35581-29.35963] 29.35493
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.35117-29.35777] 29.35782
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.35577-29.35962] 29.35434
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.35016-29.35750] 29.35753
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35522-29.35938] 29.35391
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.34950-29.35721] 29.35729
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35482-29.35924] 29.35587
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.35331-29.35784] 29.35807
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35635-29.35958] 29.35559
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.35291-29.35778] 29.35795
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35598-29.35951] 29.35500
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.35188-29.35742] 29.35762
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35536-29.35939] 29.35554
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.35279-29.35762] 29.35797
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35604-29.35948] 29.35513
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.35195-29.35759] 29.35779
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35565-29.35937] 29.35470

2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.35112-29.35730] 29.35757
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35535-29.35932] 29.35386
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.34944-29.35706] 29.35722
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35464-29.35919] 29.35345
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.34887-29.35678] 29.35699
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35433-29.35905] 29.35185
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.34678-29.35533] 29.35559
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.35169-29.35827] 29.35135
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.34623-29.35512] 29.35541
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.35173-29.35809] 29.35019
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.34381-29.35472] 29.35494
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.35094-29.35790] 29.35615
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35356-29.35794] 29.35823
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35651-29.35963] 29.35575
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35302-29.35759] 29.35806
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35615-29.35955] 29.35439
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.35040-29.35730] 29.35746
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35519-29.35932] 29.35420
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.35072-29.35714] 29.35712
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.35490-29.35920] 29.35388

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.35043-29.35697] 29.35699
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.35461-29.35909] 29.35291
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.34879-29.35652] 29.35646
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.35362-29.35892] 29.35387
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.35053-29.35700] 29.35698
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.35476-29.35920] 29.35354
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.35015-29.35685] 29.35683
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.35441-29.35914] 29.35261
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.34862-29.35646] 29.35634
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.35338-29.35888] 29.35322
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.34910-29.35680] 29.35673
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.35427-29.35903] 29.35236
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.34761-29.35639] 29.35633
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35351-29.35883] 29.35141
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.34613-29.35595] 29.35579
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35266-29.35859] 29.35355
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.34992-29.35667] 29.35674
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35433-29.35887] 29.35328
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.34954-29.35646] 29.35663
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35387-29.35883] 29.35234



3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.34797-29.35601] 29.35609
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35302-29.35863] 29.35327
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.34972-29.35651] 29.35660
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35416-29.35895] 29.35297
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.34928-29.35640] 29.35646
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35382-29.35888] 29.35206
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.34768-29.35602] 29.35597
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35281-29.35861] 29.35169
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.34662-29.35579] 29.35592
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35284-29.35851] 29.35083
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.34532-29.35541] 29.35542
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35205-29.35824] 29.34749
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.34051-29.35275] 29.35294
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.34769-29.35674] 29.34717
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.34050-29.35245] 29.35282
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.34727-29.35675] 29.34618
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.33801-29.35246] 29.35239
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.34692-29.35650] 29.35402
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35042-29.35671] 29.35695
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35452-29.35897] 29.35376

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35021-29.35660] 29.35681
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35440-29.35899] 29.35251
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.34813-29.35630] 29.35629
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35352-29.35870] 29.34900
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.34389-29.35380] 29.35395
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.35026-29.35732] 29.34801
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.34223-29.35344] 29.35349
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.34932-29.35715] 29.34677
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.34007-29.35269] 29.35284
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.34810-29.35680] 29.34878
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.34363-29.35380] 29.35375
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.34951-29.35734] 29.34793
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.34232-29.35352] 29.35336
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.34865-29.35716] 29.34679
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.34037-29.35295] 29.35275
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.34757-29.35697] 29.34842
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.34256-29.35381] 29.35376
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.34926-29.35719] 29.34751
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.34103-29.35339] 29.35332
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.34852-29.35695] 29.34637

5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.33878-29.35279] 29.35273
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.34752-29.35667] 29.34803
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.34278-29.35310] 29.35336
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.34930-29.35698] 29.34713
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.34113-29.35279] 29.35294
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.34843-29.35680] 29.34601
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.33908-29.35214] 29.35235
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.34729-29.35652] 29.34791
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.34242-29.35321] 29.35322
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.34870-29.35694] 29.34708
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.34119-29.35285] 29.35282
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.34782-29.35681] 29.34603
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.33935-29.35235] 29.35226
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.34684-29.35660] 29.34661
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.33991-29.35268] 29.35275
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.34763-29.35659] 29.34552
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.33764-29.35209] 29.35217
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.34661-29.35630] 29.33990
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.32965-29.34753] 29.34834
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.34052-29.35389] 29.33939

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.32916-29.34730] 29.34804
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.33957-29.35398] 29.33890
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.32734-29.34715] 29.34792
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.33965-29.35355] 29.34890
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.34375-29.35343] 29.35375
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.34983-29.35714] 29.34835
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.34282-29.35331] 29.35339
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.34889-29.35704] 29.34745
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.34138-29.35309] 29.35317
						[29.34838-29.35683]

**Supplementary Table 9. Reduction in Lifetime Cervical Cancer Risk for Strategies if HPV Vaccination Protection Wanes after 15 Years (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Reduction in risk compared to natural history %
None	Natural History N/A	N/A	N/A	N/A	Yes	-1.8 [-69.6-35.6]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	80.2 [74.2-85.4]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	67.6 [45.2-80.0]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	80.1 [74.1-85.2]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	67.6 [45.2-80.0]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	79.9 [73.9-85.1]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	67.5 [45.2-79.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	80.0 [74.1-84.9]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	67.5 [45.2-80.0]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	79.9 [74.0-84.8]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	67.5 [45.2-80.0]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	79.7 [73.8-84.5]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	67.5 [45.1-79.9]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	79.4 [73.8-83.5]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	67.5 [45.1-79.9]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	79.3 [73.7-83.3]

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	67.5 [45.1-79.9]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	79.1 [73.5-83.2]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	67.4 [45.0-79.9]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	79.7 [73.6-84.9]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	66.8 [42.8-79.2]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	79.6 [73.4-84.9]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	66.8 [42.8-79.1]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	79.4 [73.0-84.8]
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	66.8 [42.9-79.2]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	79.5 [73.4-84.6]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	66.8 [42.6-79.2]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	79.5 [73.4-84.5]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	66.8 [42.8-79.3]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	79.2 [73.2-84.1]
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	66.8 [42.9-79.2]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	78.8 [73.0-83.0]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	66.7 [43.0-79.3]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	78.6 [72.7-82.8]
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	66.7 [42.9-79.2]
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	76.3 [69.2-82.4]

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	63.1 [37.5-77.8]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	76.1 [68.9-81.9]
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	63.1 [37.4-77.7]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	75.5 [69.1-80.5]
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	63.0 [36.9-77.5]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	79.8 [73.4-84.9]
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	66.8 [42.8-79.2]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	79.6 [73.6-84.5]
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	66.8 [42.9-79.3]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	78.9 [72.9-83.2]
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	66.8 [42.9-79.3]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	78.1 [70.5-83.8]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	65.1 [41.6-79.1]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	77.9 [70.3-83.4]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	65.1 [41.6-79.1]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	77.3 [69.7-82.7]
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	65.0 [41.6-79.0]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	77.7 [70.0-83.4]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	64.7 [40.6-78.8]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	77.4 [69.6-82.9]

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	64.6 [40.7-78.7]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	77.0 [69.2-82.5]
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	64.6 [40.5-78.6]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	77.2 [69.5-82.2]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	64.6 [40.6-78.7]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	76.8 [69.2-81.6]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	64.5 [40.5-78.7]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	76.4 [68.8-81.1]
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	64.5 [40.5-78.5]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	76.9 [69.3-83.1]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	63.6 [38.4-78.1]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	76.7 [69.0-82.7]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	63.6 [38.5-78.1]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	76.2 [68.6-82.0]
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	63.5 [38.2-78.0]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	76.7 [69.0-82.7]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	63.3 [37.8-77.7]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	76.3 [68.6-82.0]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	63.3 [37.7-77.7]
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	76.0 [68.1-81.6]



2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	63.2 [37.7-77.7]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	75.7 [68.1-80.8]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	63.2 [37.7-77.7]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	75.4 [67.7-80.3]
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	63.2 [37.9-77.7]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	69.1 [60.0-76.9]
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	55.3 [24.1-74.2]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	68.3 [58.8-76.2]
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	53.9 [21.8-73.3]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	67.8 [58.8-74.6]
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	54.0 [22.1-73.5]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	77.1 [69.5-83.5]
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	63.7 [38.7-78.2]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	76.8 [69.0-83.0]
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	63.3 [37.8-77.6]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	76.1 [68.3-81.3]
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	63.3 [37.6-77.8]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	73.9 [64.4-81.1]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	60.3 [32.9-77.1]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	73.6 [64.2-80.7]

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	60.3 [32.8-77.0]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	72.8 [63.3-79.6]
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	60.2 [32.8-76.9]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	73.7 [64.3-80.7]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	60.3 [32.9-77.1]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	73.5 [64.1-80.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	60.3 [32.8-77.0]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	72.7 [63.3-79.3]
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	60.2 [32.7-76.8]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	73.5 [64.1-79.7]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	60.5 [33.4-77.1]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	73.0 [63.6-78.8]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	60.5 [33.4-77.0]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	72.1 [62.8-77.8]
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	60.4 [33.3-76.8]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	72.5 [62.9-80.1]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	58.7 [29.4-76.1]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	72.3 [62.7-79.8]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	58.7 [29.4-76.1]
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	71.5 [61.8-78.6]

3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	58.6 [29.4-75.9]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	72.4 [62.8-79.8]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	58.7 [29.5-76.0]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	72.2 [62.7-79.4]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	58.7 [29.5-76.0]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	71.4 [61.8-78.5]
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	58.6 [29.5-75.8]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	71.5 [61.8-77.6]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	58.5 [29.8-75.9]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	70.7 [61.0-76.8]
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	58.5 [29.5-75.6]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	61.6 [51.0-70.9]
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	47.2 [9.8-70.0]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	61.4 [50.9-70.7]
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	46.9 [9.2-69.9]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	61.4 [51.0-69.8]
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	47.9 [11.2-70.6]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	72.8 [63.0-80.6]
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	58.7 [29.5-76.1]
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	72.7 [63.1-80.1]

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	58.8 [29.5-76.1]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	72.0 [62.4-78.4]
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	58.7 [29.9-76.0]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	64.6 [53.2-73.6]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	50.3 [15.5-72.0]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	63.9 [52.6-72.7]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	50.2 [15.4-71.9]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	62.9 [51.7-71.5]
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	50.1 [15.2-71.8]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	63.5 [51.9-72.7]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	47.9 [11.4-70.2]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	62.9 [51.5-71.8]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	47.8 [11.3-70.2]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	62.1 [50.8-70.7]
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	47.7 [11.1-70.0]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	64.7 [53.6-73.1]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	50.8 [15.9-72.3]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	64.2 [53.1-72.2]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	50.7 [15.9-72.3]
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	63.4 [52.4-71.2]

5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	50.6 [15.7-72.1]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	63.0 [51.0-72.5]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	48.5 [12.3-71.2]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	62.4 [50.6-71.6]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	48.5 [12.2-71.1]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	61.5 [49.9-70.5]
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	48.4 [12.1-71.0]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	61.9 [49.6-71.5]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	46.2 [8.5-69.2]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	61.3 [49.3-70.6]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	46.2 [8.3-69.1]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	60.6 [48.7-69.6]
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	46.1 [8.3-69.0]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	62.3 [50.7-70.9]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	48.4 [11.8-70.8]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	61.6 [50.1-70.0]
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	48.3 [11.5-70.7]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	50.4 [39.3-61.1]
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	36.3 [-7.9-63.8]
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	49.4 [38.2-60.2]

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5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	34.3 [-11.6-62.0]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	50.9 [39.7-61.1]
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	37.7 [-6.6-64.6]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	63.4 [51.5-73.4]
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	48.6 [12.3-71.1]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	62.1 [49.8-72.0]
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	46.3 [8.6-69.2]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	62.8 [51.0-71.7]
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	48.5 [11.8-70.8]

**Supplementary Table 10. Costs and Quality Adjusted Life Expectancy (QALE) if HPV Vaccination Protection Wanes after 15 Years (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Lifetime costs \$	QALE QALYs
	Natural History					153 [101-203]	26.67212 [26.64543-26.69606]
None	N/A	N/A	N/A	N/A	Yes	614 [567-683]	26.70410 [26.68033-26.72238]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	3,319 [3,075-3,644]	26.74059 [26.73740-26.74271]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	3,637 [3,443-3,968]	26.74067 [26.73600-26.74364]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	3,022 [2,832-3,254]	26.74043 [26.73718-26.74263]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	3,407 [3,264-3,654]	26.74065 [26.73597-26.74363]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	2,806 [2,657-2,986]	26.74018 [26.73679-26.74255]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	3,224 [3,104-3,408]	26.74061 [26.73596-26.74360]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	3,090 [2,841-3,419]	26.74017 [26.73666-26.74253]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	3,417 [3,218-3,749]	26.74060 [26.73599-26.74359]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	2,792 [2,597-3,032]	26.74003 [26.73645-26.74245]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	3,187 [3,039-3,434]	26.74059 [26.73597-26.74358]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	2,576 [2,422-2,765]	26.73976 [26.73594-26.74229]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	3,003 [2,891-3,189]	26.74054 [26.73593-26.74352]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	2,815 [2,567-3,148]	26.73873 [26.73375-26.74189]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	3,154 [2,959-3,485]	26.74043 [26.73582-26.74349]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	2,518	26.73846

1 yr	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[2,323-2,762] 2,924	[26.73324-26.74178] 26.74041
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[2,781-3,171] 2,302	[26.73576-26.74348] 26.73819
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[2,148-2,494] 2,741	[26.73276-26.74163] 26.74036
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[2,632-2,926] 2,603	[26.73573-26.74343] 26.74039
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[2,419-2,825] 2,950	[26.73700-26.74247] 26.74045
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[2,793-3,194] 2,458	[26.73555-26.74342] 26.74020
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[2,314-2,627] 2,856	[26.73664-26.74237] 26.74040
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[2,727-3,037] 2,362	[26.73558-26.74335] 26.73995
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[2,248-2,499] 2,785	[26.73639-26.74228] 26.74038
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[2,676-2,920] 2,374	[26.73558-26.74338] 26.73996
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[2,184-2,600] 2,730	[26.73633-26.74225] 26.74038
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[2,578-2,975] 2,228	[26.73553-26.74339] 26.73981
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[2,079-2,405] 2,635	[26.73596-26.74218] 26.74035
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[2,514-2,818] 2,133	[26.73543-26.74339] 26.73956
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[2,014-2,270] 2,564	[26.73561-26.74205] 26.74032
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[2,463-2,701] 1,954	[26.73547-26.74331] 26.73823
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1,805-2,135] 2,373	[26.73267-26.74153] 26.74017
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[2,258-2,555] 1,858	[26.73545-26.74328] 26.73795
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[1,739-2,000] 2,302	[26.73224-26.74137] 26.74012
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[2,207-2,438] 2,049	[26.73533-26.74318] 26.73832



1 yr	trriage Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1,973-2,121] 2,490	[26.73419-26.74130] 26.73895
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[2,424-2,551] 1,819	[26.73289-26.74275] 26.73786
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[1,757-1,882] 2,270	[26.73313-26.74094] 26.73884
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[2,213-2,333] 1,545	[26.73304-26.74261] 26.73632
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[1,497-1,599] 2,007	[26.73010-26.74036] 26.73868
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,960-2,067] 2,965	[26.73279-26.74253] 26.74051
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[2,702-3,317] 3,208	[26.73719-26.74262] 26.74043
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[2,934-3,605] 2,558	[26.73554-26.74336] 26.74008
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[2,319-2,856] 2,855	[26.73637-26.74230] 26.74038
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[2,646-3,186] 2,099	[26.73535-26.74338] 26.73848
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1,910-2,329] 2,466	[26.73325-26.74162] 26.74019
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[2,320-2,711] 2,025	[26.73544-26.74330] 26.73919
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1,794-2,348] 2,351	[26.73571-26.74173] 26.73972
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[2,176-2,648] 1,842	[26.73471-26.74327] 26.73885
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[1,656-2,083] 2,227	[26.73509-26.74163] 26.73969
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[2,086-2,461] 1,663	[26.73470-26.74325] 26.73807
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[1,524-1,831] 2,087	[26.73371-26.74115] 26.73958
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1,975-2,251] 1,941	[26.73462-26.74311] 26.73879
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[1,690-2,295] 2,258	[26.73503-26.74158] 26.73958
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[2,063-2,581] 1,672	[26.73461-26.74319] 26.73828

2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[1,489-1,902] 2,073	[26.73411-26.74139] 26.73951
2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1,939-2,296] 1,549	[26.73455-26.74310] 26.73772
2 yrs	trriage Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[1,398-1,730] 1,976	[26.73317-26.74110] 26.73943
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1,867-2,151] 1,786	[26.73447-26.74302] 26.73756
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[1,535-2,143] 2,112	[26.73248-26.74120] 26.73944
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1,920-2,435] 1,518	[26.73444-26.74310] 26.73685
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[1,335-1,752] 1,928	[26.73123-26.74088] 26.73934
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[1,797-2,151] 1,394	[26.73435-26.74297] 26.73630
2 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[1,244-1,579] 1,831	[26.73033-26.74052] 26.73925
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1,726-2,007] 1,533	[26.73428-26.74284] 26.73857
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[1,380-1,730] 1,899	[26.73491-26.74127] 26.73920
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1,765-2,078] 1,445	[26.73385-26.74291] 26.73823
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[1,321-1,593] 1,850	[26.73430-26.74117] 26.73917
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1,737-1,990] 1,369	[26.73386-26.74290] 26.73751
2 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[1,270-1,485] 1,801	[26.73308-26.74076] 26.73905
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1,707-1,902] 1,423	[26.73377-26.74274] 26.73820
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[1,257-1,641] 1,787	[26.73428-26.74100] 26.73907
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1,652-1,981] 1,297	[26.73377-26.74278] 26.73769
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[1,172-1,438] 1,715	[26.73323-26.74083] 26.73899
2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1,611-1,849] 1,242	[26.73365-26.74271] 26.73717

2 yrs	trriage Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[1,139-1,356] 1,679	[26.73226-26.74057] 26.73893
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1,589-1,783] 1,142	[26.73363-26.74271] 26.73627
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[1,018-1,288] 1,570	[26.73039-26.74033] 26.73886
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1,471-1,704] 1,088	[26.73363-26.74260] 26.73574
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[985-1,203] 1,534	[26.72958-26.74001] 26.73877
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1,449-1,639] 1,178	[26.73353-26.74248] 26.73351
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[1,116-1,243] 1,626	[26.72667-26.73815] 26.73558
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1,563-1,688] 1,044	[26.72720-26.74116] 26.73292
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[993-1,097] 1,499	[26.72605-26.73783] 26.73524
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1,444-1,565] 889	[26.72689-26.74086] 26.73160
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[847-937] 1,354	[26.72310-26.73749] 26.73515
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,307-1,418] 1,858	[26.72681-26.74082] 26.73893
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1,628-2,209] 2,111	[26.73544-26.74142] 26.73925
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,871-2,450] 1,571	[26.73390-26.74294] 26.73845
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[1,357-1,862] 1,879	[26.73461-26.74099] 26.73911
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1,700-2,148] 1,268	[26.73383-26.74279] 26.73689
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[1,102-1,490] 1,641	[26.73148-26.74059] 26.73891
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1,511-1,836] 1,436	[26.73359-26.74272] 26.73642
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[1,259-1,696] 1,798	[26.73180-26.74036] 26.73780
3 yrs	Cytology with HPV	18	Combination HPV / Cytology	30	No	[1,666-2,012] 1,330	[26.73188-26.74247] 26.73603

3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	30	Yes	[1,181-1,534] 1,731	[26.73114-26.74014] 26.73775
3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	35	No	[1,616-1,908] 1,196	[26.73185-26.74242] 26.73485
3 yrs	trriage Cytology with HPV	18	Combination HPV / Cytology	35	Yes	[1,085-1,336] 1,631	[26.72908-26.73952] 26.73758
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	25	No	[1,539-1,753] 1,347	[26.73175-26.74221] 26.73606
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	25	Yes	[1,164-1,610] 1,714	[26.73151-26.74019] 26.73774
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	30	No	[1,584-1,930] 1,241	[26.73187-26.74243] 26.73565
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	30	Yes	[1,086-1,449] 1,647	[26.73083-26.74004] 26.73770
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	35	No	[1,537-1,826] 1,107	[26.73183-26.74239] 26.73451
3 yrs	trriage Cytology with HPV	21	Combination HPV / Cytology	35	Yes	[990-1,251] 1,547	[26.72887-26.73951] 26.73754
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	25	No	[1,460-1,671] 1,327	[26.73169-26.74213] 26.73529
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	25	Yes	[1,121-1,639] 1,676	[26.72976-26.73993] 26.73766
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	30	No	[1,524-1,926] 1,115	[26.73161-26.74227] 26.73426
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	30	Yes	[967-1,314] 1,536	[26.72791-26.73944] 26.73754
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	35	No	[1,432-1,706] 989	[26.73148-26.74218] 26.73308
3 yrs	trriage Cytology with HPV	25	Combination HPV / Cytology	35	Yes	[878-1,130] 1,440	[26.72605-26.73887] 26.73738
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	25	No	[1,358-1,558] 1,096	[26.73137-26.74200] 26.73561
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	25	Yes	[978-1,254] 1,491	[26.73081-26.73970] 26.73718
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	30	No	[1,385-1,623] 1,049	[26.73078-26.74205] 26.73528
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	30	Yes	[949-1,174] 1,468	[26.73001-26.73949] 26.73715
3 yrs	trriage Cytology with HPV	18	HPV with Cytology triage	35	No	[1,374-1,580] 987	[26.73077-26.74206] 26.73415

3 yrs	trriage Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[905-1,083] 1,428	[26.72814-26.73893] 26.73698
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1,352-1,511] 1,007	[26.73067-26.74181] 26.73529
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[884-1,169] 1,407	[26.73040-26.73956] 26.73713
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1,306-1,535] 960	[26.73082-26.74204] 26.73493
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[855-1,089] 1,384	[26.72975-26.73944] 26.73709
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1,295-1,491] 898	[26.73080-26.74195] 26.73382
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[817-988] 1,345	[26.72781-26.73895] 26.73692
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1,273-1,422] 844	[26.73061-26.74171] 26.73344
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[743-968] 1,280	[26.72669-26.73873] 26.73684
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[1,197-1,382] 787	[26.73032-26.74175] 26.73237
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[710-876] 1,243	[26.72506-26.73825] 26.73669
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[1,176-1,314] 848	[26.73024-26.74156] 26.72828
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[795-904] 1,303	[26.71897-26.73497] 26.73203
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1,246-1,367] 759	[26.72151-26.73920] 26.72790
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[712-814] 1,219	[26.71885-26.73473] 26.73195
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[1,168-1,286] 655	[26.72144-26.73920] 26.72679
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[616-703] 1,123	[26.71628-26.73462] 26.73201
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[1,079-1,187] 1,389	[26.72144-26.73928] 26.73619
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[1,187-1,699] 1,677	[26.73141-26.73975] 26.73723
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,482-1,983] 1,171	[26.73079-26.74208] 26.73587

3 yrs	trriage HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[992-1,427] 1,506	[26.73110-26.73968] 26.73719
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1,362-1,742] 948	[26.73082-26.74207] 26.73442
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[811-1,141] 1,337	[26.72855-26.73930] 26.73697
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[1,228-1,494] 988	[26.73042-26.74185] 26.73000
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[855-1,188] 1,379	[26.72300-26.73626] 26.73334
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[1,275-1,539] 882	[26.72453-26.74006] 26.72886
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[781-1,021] 1,312	[26.72104-26.73581] 26.73320
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[1,225-1,429] 812	[26.72445-26.73994] 26.72742
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[733-916] 1,259	[26.71855-26.73495] 26.73300
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[1,185-1,344] 971	[26.72430-26.73970] 26.72983
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[817-1,205] 1,348	[26.72319-26.73620] 26.73280
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[1,239-1,527] 846	[26.72381-26.73970] 26.72885
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[728-1,005] 1,272	[26.72134-26.73584] 26.73269
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[1,184-1,403] 767	[26.72368-26.73965] 26.72752
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[675-885] 1,215	[26.71904-26.73513] 26.73251
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[1,142-1,311] 961	[26.72359-26.73946] 26.72948
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[793-1,224] 1,328	[26.72174-26.73629] 26.73331
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[1,210-1,532] 812	[26.72447-26.73997] 26.72842
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[689-988] 1,235	[26.71984-26.73579] 26.73318
5 yrs	Cytology with HPV	25	Combination HPV / Cytology	35	No	[1,146-1,377] 727	[26.72437-26.73988] 26.72710

5 yrs	trriage Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[631-855] 1,176	[26.71729-26.73503] 26.73299
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[1,102-1,280] 747	[26.72423-26.73966] 26.72887
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[660-861] 1,166	[26.72165-26.73544] 26.73255
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[1,085-1,262] 700	[26.72326-26.73967] 26.72782
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[630-787] 1,142	[26.71975-26.73507] 26.73242
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[1,073-1,216] 672	[26.72309-26.73956] 26.72654
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[611-748] 1,124	[26.71741-26.73433] 26.73224
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[1,063-1,183] 704	[26.72296-26.73935] 26.72877
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[609-839] 1,117	[26.72163-26.73547] 26.73206
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[1,035-1,220] 647	[26.72256-26.73922] 26.72781
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[573-742] 1,089	[26.71990-26.73501] 26.73194
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[1,021-1,166] 615	[26.72249-26.73914] 26.72660
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[555-695] 1,069	[26.71778-26.73439] 26.73180
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[1,011-1,129] 598	[26.72241-26.73902] 26.72733
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[522-700] 1,039	[26.71845-26.73491] 26.73230
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[972-1,119] 562	[26.72298-26.73931] 26.72609
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[501-638] 1,019	[26.71596-26.73420] 26.73212
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[961-1,080] 594	[26.72283-26.73915] 26.71960
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[548-646] 1,053	[26.70665-26.72905] 26.72670
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[1,003-1,118] 531	[26.71290-26.73623] 26.71909

U.S. Cervical Cancer Prevention

Supplementary Appendix

5 yrs	trriage Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[489-583] 995	[26.70618-26.72865] 26.72611
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[950-1,063] 471	[26.71236-26.73579] 26.71857
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[435-521] 939	[26.70423-26.72862] 26.72675
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[898-1,006] 980	[26.71321-26.73607] 26.72987
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[814-1,227] 1,307	[26.72321-26.73581] 26.73267
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[1,158-1,537] 807	[26.72323-26.73975] 26.72930
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[673-1,003] 1,179	[26.72231-26.73560] 26.73212
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[1,068-1,353] 668	[26.72266-26.73928] 26.72831
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[566-819] 1,076	[26.72032-26.73539] 26.73241
						[990-1,190]	[26.72305-26.73944]



**Supplementary Table 11. Discounted Life Expectancy if HPV Vaccination Protection Wanes after 15 Years (Means and Minimums and Maximums)**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Life expectancy years
	Natural History					29.29524 [29.27145-29.31664]
None	N/A	N/A	N/A	N/A	Yes	29.32471 [29.30434-29.34073]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	29.35737 [29.35527-29.35888]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	29.35751 [29.35450-29.35951]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	29.35725 [29.35512-29.35881]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	29.35749 [29.35448-29.35950]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	29.35706 [29.35482-29.35875]
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	29.35747 [29.35449-29.35949]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	29.35701 [29.35464-29.35870]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	29.35745 [29.35450-29.35947]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	29.35691 [29.35450-29.35866]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	29.35744 [29.35448-29.35947]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	29.35671 [29.35408-29.35853]
1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	29.35740 [29.35445-29.35943]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	29.35577 [29.35209-29.35825]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	29.35730 [29.35433-29.35938]
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	29.35554

1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.35167-29.35819] 29.35727
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35426-29.35937] 29.35533
1 yr	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.35128-29.35808] 29.35724
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35423-29.35934] 29.35721
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.35491-29.35869] 29.35732
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35408-29.35934] 29.35706
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.35459-29.35857] 29.35728
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35415-29.35928] 29.35687
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.35445-29.35854] 29.35727
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35413-29.35930] 29.35685
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.35433-29.35851] 29.35726
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35408-29.35930] 29.35672
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.35405-29.35845] 29.35723
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35400-29.35934] 29.35654
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.35376-29.35835] 29.35720
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35403-29.35926] 29.35532
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.35114-29.35797] 29.35706
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35400-29.35920] 29.35512
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.35081-29.35788] 29.35704
1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35395-29.35912] 29.35565

1 yr	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.35288-29.35788] 29.35625
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.35217-29.35884] 29.35529
1 yr	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.35200-29.35755] 29.35615
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.35232-29.35873] 29.35395
1 yr	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.34933-29.35713] 29.35600
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.35207-29.35866] 29.35728
1 yr	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35504-29.35873] 29.35730
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35408-29.35927] 29.35695
1 yr	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35431-29.35852] 29.35726
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35389-29.35929] 29.35555
1 yr	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.35159-29.35800] 29.35708
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35402-29.35923] 29.35636
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.35402-29.35820] 29.35685
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.35360-29.35924] 29.35608
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.35355-29.35813] 29.35683
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.35358-29.35923] 29.35544
2 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.35239-29.35772] 29.35674
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.35351-29.35912] 29.35600
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.35340-29.35809] 29.35673
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.35352-29.35918] 29.35559

2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.35266-29.35797] 29.35668
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.35348-29.35910] 29.35515
2 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.35192-29.35775] 29.35661
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.35341-29.35905] 29.35493
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.35117-29.35777] 29.35661
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.35337-29.35910] 29.35434
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.35016-29.35750] 29.35651
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35329-29.35900] 29.35391
2 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.34950-29.35721] 29.35645
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35323-29.35891] 29.35587
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.35331-29.35784] 29.35645
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35287-29.35895] 29.35559
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.35291-29.35778] 29.35641
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35289-29.35896] 29.35500
2 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.35188-29.35742] 29.35632
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35283-29.35883] 29.35554
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.35279-29.35762] 29.35633
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35289-29.35884] 29.35513
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.35195-29.35759] 29.35625
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35279-29.35880] 29.35470

2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.35112-29.35730] 29.35621
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35278-29.35881] 29.35386
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.34944-29.35706] 29.35612
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35268-29.35870] 29.35345
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.34887-29.35678] 29.35606
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35257-29.35862] 29.35185
2 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.34678-29.35533] 29.35365
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.34777-29.35759] 29.35135
2 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.34623-29.35512] 29.35333
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.34758-29.35730] 29.35019
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.34381-29.35472] 29.35325
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.34745-29.35727] 29.35615
2 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35356-29.35794] 29.35649
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35292-29.35894] 29.35575
2 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35302-29.35759] 29.35637
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35295-29.35887] 29.35439
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.35040-29.35730] 29.35616
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35267-29.35881] 29.35420
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.35072-29.35714] 29.35540
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.35148-29.35867] 29.35388

3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.35043-29.35697] 29.35537
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.35148-29.35863] 29.35291
3 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.34879-29.35652] 29.35522
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.35139-29.35847] 29.35387
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.35053-29.35700] 29.35535
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.35149-29.35862] 29.35354
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.35015-29.35685] 29.35531
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.35146-29.35860] 29.35261
3 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.34862-29.35646] 29.35518
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.35133-29.35839] 29.35322
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.34910-29.35680] 29.35530
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.35121-29.35850] 29.35236
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.34761-29.35639] 29.35520
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.35110-29.35843] 29.35141
3 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.34613-29.35595] 29.35506
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.35101-29.35830] 29.35355
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.34992-29.35667] 29.35491
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.35064-29.35833] 29.35328
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.34954-29.35646] 29.35488
3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.35062-29.35833] 29.35234

3 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.34797-29.35601] 29.35474
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.35051-29.35813] 29.35327
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.34972-29.35651] 29.35486
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.35065-29.35831] 29.35297
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.34928-29.35640] 29.35482
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.35066-29.35824] 29.35206
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.34768-29.35602] 29.35468
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.35049-29.35804] 29.35169
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.34662-29.35579] 29.35463
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.35016-29.35807] 29.35083
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.34532-29.35541] 29.35450
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.35010-29.35793] 29.34749
3 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.34051-29.35275] 29.35068
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.34298-29.35599] 29.34717
3 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.34050-29.35245] 29.35064
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.34307-29.35593] 29.34618
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.33801-29.35246] 29.35068
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.34290-29.35604] 29.35402
3 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.35042-29.35671] 29.35496
3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.35063-29.35836] 29.35376

3 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.35021-29.35660] 29.35490
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.35061-29.35832] 29.35251
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.34813-29.35630] 29.35472
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	No	[29.35024-29.35815] 29.34900
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	[29.34389-29.35380] 29.35181
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	No	[29.34555-29.35671] 29.34801
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	[29.34223-29.35344] 29.35168
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	No	[29.34548-29.35661] 29.34677
5 yrs	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	[29.34007-29.35269] 29.35151
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	No	[29.34534-29.35637] 29.34878
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	25	Yes	[29.34363-29.35380] 29.35131
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	No	[29.34480-29.35644] 29.34793
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	30	Yes	[29.34232-29.35352] 29.35122
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	No	[29.34469-29.35643] 29.34679
5 yrs	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	[29.34037-29.35295] 29.35106
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	No	[29.34463-29.35625] 29.34842
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	25	Yes	[29.34256-29.35381] 29.35177
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	No	[29.34543-29.35661] 29.34751
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	30	Yes	[29.34103-29.35339] 29.35165
5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	No	[29.34534-29.35655] 29.34637



5 yrs	Cytology with HPV triage	25	Combination HPV / Cytology	35	Yes	[29.33878-29.35279] 29.35149
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	No	[29.34523-29.35637] 29.34803
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	[29.34278-29.35310] 29.35114
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	No	[29.34449-29.35638] 29.34713
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	30	Yes	[29.34113-29.35279] 29.35102
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	No	[29.34432-29.35628] 29.34601
5 yrs	Cytology with HPV triage	18	HPV with Cytology triage	35	Yes	[29.33908-29.35214] 29.35088
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	No	[29.34421-29.35609] 29.34791
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	[29.34242-29.35321] 29.35070
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	[29.34381-29.35601] 29.34708
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	[29.34119-29.35285] 29.35060
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	No	[29.34376-29.35596] 29.34603
5 yrs	Cytology with HPV triage	21	HPV with Cytology triage	35	Yes	[29.33935-29.35235] 29.35047
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	[29.34370-29.35587] 29.34661
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	[29.33991-29.35268] 29.35090
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	[29.34413-29.35608] 29.34552
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	[29.33764-29.35209] 29.35075
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	No	[29.34402-29.35593] 29.33990
5 yrs	Cytology with HPV triage	18	Cytology with HPV triage	None	Yes	[29.32965-29.34753] 29.34602
5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	No	[29.33542-29.35334] 29.33939

5 yrs	Cytology with HPV triage	21	Cytology with HPV triage	None	Yes	[29.32916-29.34730] 29.34548
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	[29.33487-29.35303] 29.33890
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	[29.32734-29.34715] 29.34605
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	No	[29.33576-29.35319] 29.34890
5 yrs	HPV with Cytology triage	18	HPV with Cytology triage	None	Yes	[29.34375-29.35343] 29.35126
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	No	[29.34447-29.35644] 29.34835
5 yrs	HPV with Cytology triage	21	HPV with Cytology triage	None	Yes	[29.34282-29.35331] 29.35076
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	No	[29.34390-29.35608] 29.34745
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	[29.34138-29.35309] 29.35101
						[29.34422-29.35619]

**Supplementary Table 12. Cost-effectiveness Results under Alternative Vaccine Performance Assumptions**

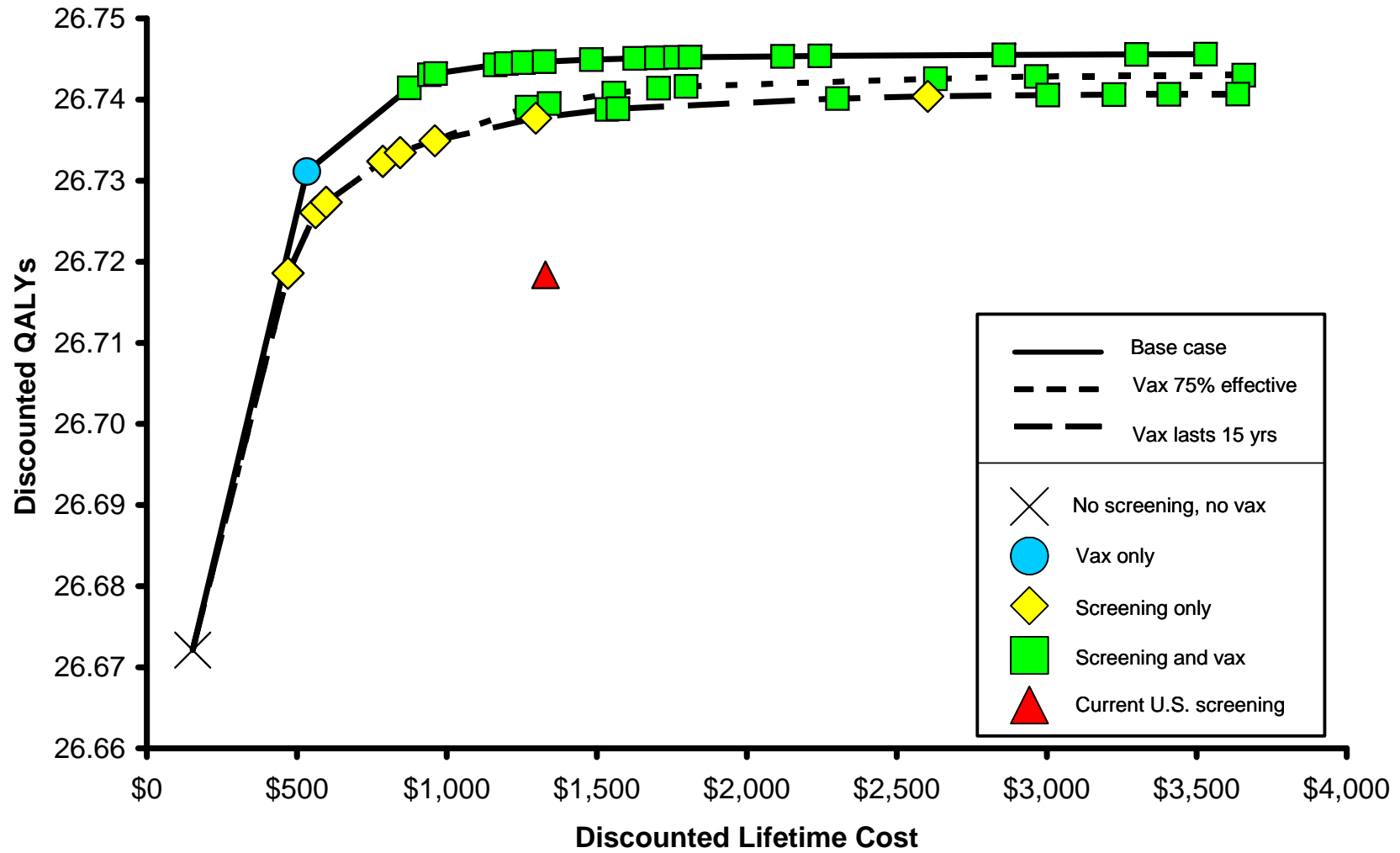
Vaccine is 75% Effective								
Screening frequency	Screening strategy in younger women	Start age	Screening strategy in older women	Switch age	Pre-adolescent vaccination	Cost	QALE	ICER
		years		years		\$	QALYs	\$/QALY
	Natural History					153	26.67212	
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	471	26.71857	\$7,000
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	562	26.72609	\$12,000
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	598	26.72733	\$29,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	787	26.73237	\$37,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	844	26.73344	\$53,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	1,267	26.73906	\$75,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1,341	26.73951	\$164,000
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	1,558	26.74079	\$169,000
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	1,706	26.74141	\$239,000
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	25	Yes	1,798	26.74163	\$418,000
1 yr	Cytology with HPV triage	21	HPV with Cytology triage	30	Yes	2,629	26.74257	\$884,000
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	2,965	26.74284	\$1,246,000
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	3,656	26.74298	\$4,937,000

Vaccine Protection Wanes in 15 Years								
Screening frequency	Screening strategy in younger women	Start age	Screening strategy in older women	Switch age	Pre-adolescent vaccination	Cost	QALE	ICER
		years		years		\$	QALYs	\$/QALY
	Natural History					153	26.67212	
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No	471	26.71857	\$7,000
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	562	26.72609	\$12,000
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	598	26.72733	\$29,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	787	26.73237	\$37,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	No	844	26.73344	\$53,000
3 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	960	26.73493	\$78,000
2 yrs	Cytology with HPV triage	21	HPV with Cytology triage	30	No	1,297	26.73769	\$122,000
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	1,534	26.73877	\$220,000
2 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	1,570	26.73886	\$401,000
1 yr	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	2,302	26.74012	\$581,000
1 yr	Cytology with HPV triage	18	HPV with Cytology triage	25	Yes	2,603	26.74039	\$1,116,000

1 yr	Cytology with HPV triage	21	Combination HPV / Cytology	35	Yes	3,003	26.74054	\$2,668,000
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	35	Yes	3,224	26.74061	\$3,151,000
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	30	Yes	3,407	26.74065	\$4,588,000
1 yr	Cytology with HPV triage	18	Combination HPV / Cytology	25	Yes	3,637	26.74067	\$11,480,000

**Supplementary Figure 4. Efficient Frontiers under Alternative Assumptions about Vaccine Performance**



**Supplementary Table 13. Effect of Vaccine Coverage and Age at Which Vaccine Protection Provides a 30% Reduction in HPV 16/18 for Unvaccinated Women (Approximated Herd Immunity)**

Screening frequency	Screening strategy in younger women	Start age	Screening strategy in older women	Switch age	Pre-adolescent vaccination	ICERs (\$/QALY) at different starting age for herd immunity with 70% vaccine coverage assumption			
						20 yrs	30 yrs	40 yrs	50 yrs
None	N/A	N/A	N/A	N/A	No				
None	N/A	N/A	N/A	N/A	Yes	6,000	6,000	6,000	6,000
5yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No				
5yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	19,000	20,000		
5yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No	15,000	14,000	13,000	12,000
5yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	20,000	20,000	20,000	21,000
3yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No				
3yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	98,000	96,000	93,000	89,000
2yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No				
2yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	245,000	238,000	224,000	219,000
						ICERs (\$/QALY) at different starting age for herd immunity with 90% vaccine coverage assumption			
						20 yrs	30 yrs	40 yrs	50 yrs
None	N/A	N/A	N/A	N/A	No				
None	N/A	N/A	N/A	N/A	Yes	6,000	6,000	6,000	6,000
5yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	No				
5yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	26,000	25,000	25,000	25,000
5yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	No				

5yrs	HPV triage Cytology with HPV triage	25	Cytology triage HPV with Cytology triage	35	Yes	29,000	28,000	28,000	27,000
3yrs	Cytology with HPV triage	25	Cytology triage HPV with Cytology triage	35	No				
3yrs	Cytology with HPV triage	25	Cytology triage HPV with Cytology triage	35	Yes	151,000	151,000	150,000	145,000
2yrs	Cytology with HPV triage	25	Cytology triage HPV with Cytology triage	35	No				
2yrs	Cytology with HPV triage	25	Cytology triage HPV with Cytology triage	35	Yes	409,000	409,000	396,000	395,000

**Supplementary Table 14. Results of Cytology Test Characteristics Sensitivity Analysis**

Screening frequency	Screening strategy in younger women	Start age years	Screening strategy in older women	Switch age years	Pre-adolescent vaccination	Cost \$	QALE QALYs	ICER \$/QALY
<b>A. Cytology sensitivity: 40%</b>								
None	Natural History N/A	N/A	N/A	N/A	Yes	156	26.67046	
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	532	26.73183	6,000
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	920	26.74286	35,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	970	26.74343	89,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1215	26.74440	253,000
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1500	26.74480	718,000
<b>B. Cytology sensitivity: 50%</b>								
None	Natural History N/A	N/A	N/A	N/A	Yes	156	26.67046	
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	532	26.73183	6,000
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	923	26.74321	34,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	972	26.74368	105,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1217	26.74465	252,000
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1503	26.74503	738,000
<b>C. Cytology sensitivity: 60%</b>								
None	Natural History N/A	N/A	N/A	N/A	Yes	156	26.67046	
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	532	26.73183	6,000
5 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	927	26.74349	34,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	974	26.74385	130,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1142	26.74453	246,000
3 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1219	26.74483	260,000
2 yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	1506	26.74520	777,000



**Supplementary Table 15. Comparison of Current Screening Practice with and without HPV Vaccination (Means, Minimums and Maximums)**

Strategy / Scenario	Reduction in Lifetime Cancer Risk %	Cost \$	QALE QALYs	CER (compared to current screening without vaccine) \$/QALY
Current screening without vaccination	52.6 [46.9-57.7]	1,329 [1,274-1,398]	26.71839 [26.70716-26.72739]	
Current screening with best-case HPV vaccine	88.4 [81.6-94.2]	1,728 [1,686-1,780]	26.74099 [26.73638-26.74414]	18,000
Current screening with 75% effective HPV vaccine	68.4 [51.7-78.4]	1,776 [1,725-1,845]	26.72958 [26.72029-26.73641]	40,000
Current screening with 20-year duration HPV vaccine	42.1 [2.6-64.6]	1,787 [1,732-1,872]	26.72806 [26.71631-26.73619]	47,000

**Supplementary Table 16. Marginal Benefit (Quality-Adjusted Life Expectancy Gain) of Adding Vaccination to Screening for Women of Different Ages under Alternative Assumptions of Screening Behavior**

Screening behavior assumption in the presence of vaccination	Vaccination policy	Units	9- to 12-year- olds	21- to 24-year- olds	25- to 29-year- olds
No change to screening behavior	Not vaccinated	QALYs	23.72665	16.58308	12.15037
No change to screening behavior	Vaccinate, 100% coverage	QALYs	23.74915	16.59540	12.15480
		Quality-adjusted life days gained	8.2	4.5	1.6
70% screening q3	Vaccinate, 25% coverage	QALYs	23.72579	16.57896	12.14377
		Quality-adjusted life days gained	-0.3	-1.5	-2.4
70% screening q3	Vaccinate, 75% coverage	QALYs	23.74030	16.58695	12.14666
		Quality-adjusted life days gained	5.0	1.4	-1.4
70% screening q3	Vaccinate, 100% coverage	QALYs	23.74755	16.59094	12.14810
		Quality-adjusted life days gained	7.6	2.9	-0.8

\* q3 = screening every 3 years

**Supplementary Table 17. Potential Impact on Disparities of the Distribution of Screening and Vaccine Resources (Cervical Cancer Reduction)**

	White	African American	Asian / Pacific Islander	American Indian / Alaskan Native	Hispanic
<b>Disparities Widen:</b>					
<b>Uptake percentage of new technologies by Whites: 75%</b>					
<b>Uptake percentage of new technologies by Racial/Ethnic Minorities: 25%</b>					
Benefit of Cytology alone, race-/ethnicity-specific patterns of utilization	54%	51%	43%	46%	50%
Incremental benefit of HPV-DNA testing w/ Cyto triage after age 35	4%	4%	4%	4%	4%
Incremental benefit of HPV 16,18 Vaccination for pre-adolescents	10%	3%	3%	3%	3%
Incremental benefit of new screening strategies every 3 years	7%	4%	6%	5%	4%
<b>Total Incremental Benefit</b>	<b>22%</b>	<b>11%</b>	<b>13%</b>	<b>14%</b>	<b>11%</b>
<b>Total Benefit</b>	<b>76%</b>	<b>62%</b>	<b>56%</b>	<b>59%</b>	<b>61%</b>
<b>Disparities Narrow:</b>					
<b>Uptake percentage of new technologies by Whites: 50%</b>					
<b>Uptake percentage of new technologies by Racial/Ethnic Minorities: 50%</b>					
Benefit of Cytology alone, race-/ethnicity-specific patterns of utilization	54%	51%	43%	46%	50%
Incremental benefit of HPV-DNA testing w/ Cyto triage after age 35	4%	4%	4%	4%	4%
Incremental benefit of HPV 16,18 Vaccination for pre-adolescents	7%	7%	7%	7%	7%
Incremental benefit of new screening strategies every 3 years	5%	7%	11%	9%	8%
<b>Total Incremental Benefit</b>	<b>16%</b>	<b>18%</b>	<b>22%</b>	<b>20%</b>	<b>18%</b>
<b>Total Benefit</b>	<b>70%</b>	<b>69%</b>	<b>65%</b>	<b>66%</b>	<b>68%</b>

**Supplementary Table 18. Reduction in Positive Predictive Value of Cervical Cytology Caused by HPV Vaccination by 5-year Age Group**

<b>Age Range</b>	<b>Average</b>	<b>Maximum</b>	<b>Minimum</b>
25-29	64%	64%	55%
30-34	61%	63%	49%
35-39	56%	59%	44%
40-44	55%	60%	43%
45-49	55%	62%	44%
50-54	57%	61%	47%
55-59	60%	63%	50%
60-64	62%	66%	52%

**Supplementary Table 19. Results of HPV DNA Test Characteristics Sensitivity Analysis: Test Sensitivity (Probability of Positive Test Results in the Presence of High Risk HPV DNA) (Strategies with ICERs Less than \$500,000 per QALY)**

Screening frequency	Screening strategy in younger women	Start age	Screening strategy in older women	Switch age	Pre-adolescent vaccination	HPV Sensitivity	HPV Sensitivity	HPV Sensitivity
						92.5% HPV Specificity	85.0% HPV Specificity	70.0% HPV Specificity
						ICER \$/QALY	ICER \$/QALY	ICER \$/QALY
None	Natural History	N/A	N/A	N/A	Yes	6,000	6,000	6,000
5yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	34,000	34,000	35,000
5yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	42,000	52,000	
5yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	95,000	111,000	
3yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes			118,000
3yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	200,000	171,000	
3yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	226,000	203,000	
3yrs	HPV with Cytology triage	25	HPV with Cytology triage	None	Yes	421,000		
2yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes			271,000
2yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes		482,000	

**Supplementary Table 20. Results of HPV DNA Test Characteristics Sensitivity Analysis: Test Specificity (Probability of Negative Test Results in the Absence of High Risk HPV DNA) (Strategies with ICERs Less than \$500,000 per QALY)**

Screening frequency	Screening strategy in younger women	Start age	Screening strategy in older women	Switch age	Pre-adolescent vaccination	HPV Sensitivity 100% HPV Specificity 92.5% ICER \$/QALY	HPV Sensitivity 100% HPV Specificity 85.0% ICER \$/QALY	HPV Sensitivity 100% HPV Specificity 70.0% ICER \$/QALY
None	Natural History N/A	N/A	N/A	N/A	Yes	6,000	6,000	6,000
5 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes	34,000	35,000	36,000
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	88,000		
5 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	207,000		
3 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes		130,000	133,000
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	35	Yes	261,000	369,000	
3 yrs	Cytology with HPV triage	25	HPV with Cytology triage	30	Yes	554,000		
2 yrs	Cytology with HPV triage	25	Cytology with HPV triage	None	Yes		314,000	326,000