

Supplementary Material*

Rosenblum HG, Lewis RM, Gargano JW, et al. Human papillomavirus vaccine impact and effectiveness through 12 years after vaccine introduction in the United States, 2003 to 2018. *Ann Intern Med.* 17 May 2022. [Epub ahead of print]. doi:10.7326/M21-3798

Supplement Figure 1: Participation and sample collection among females, National Health and Nutrition Examination Survey, 2003–2018

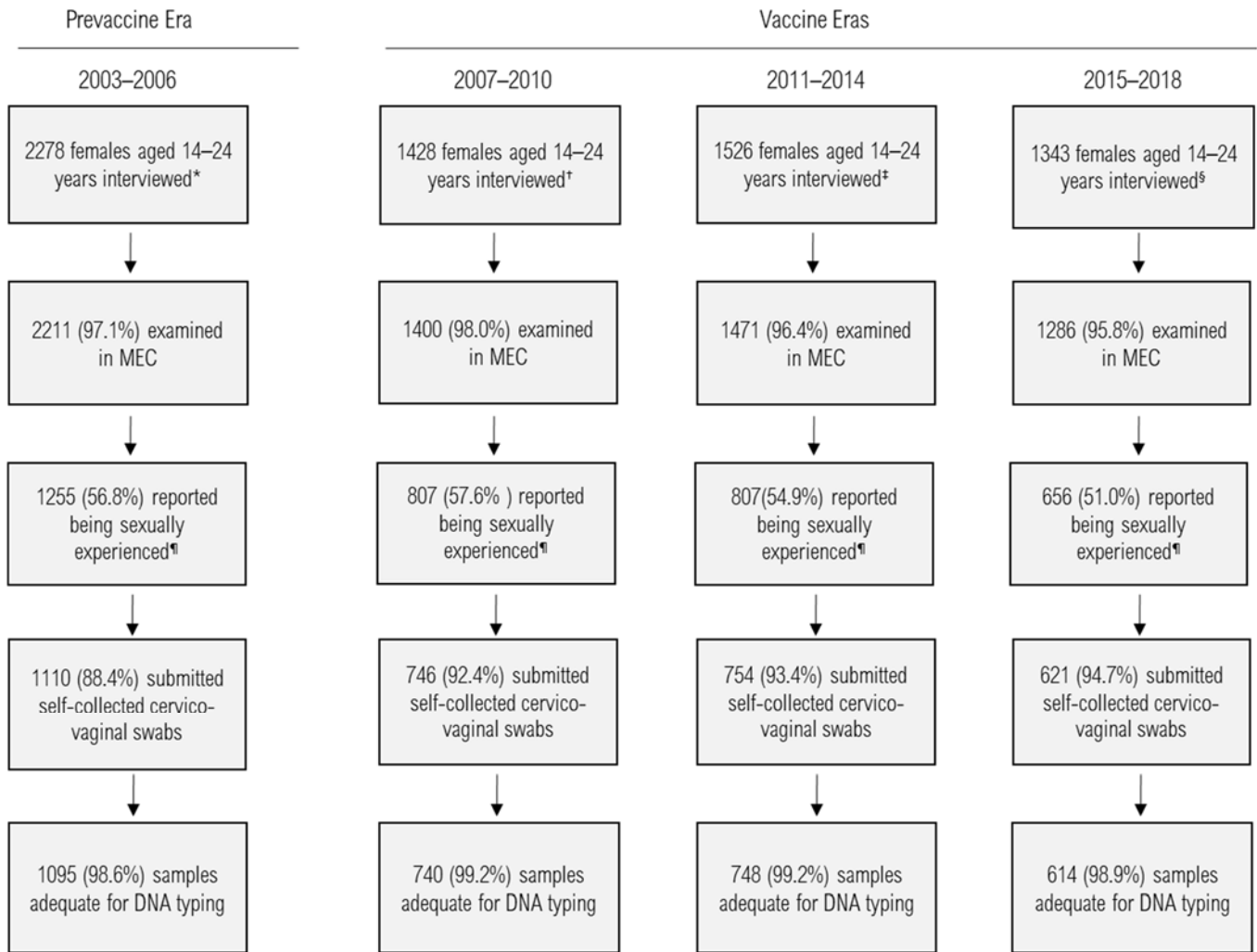
Supplement Figure 2: Participation and sample collection among males, National Health and Nutrition Examination Survey, 2011–2018

Supplement Table 1: Characteristics of sexually experienced males aged 14–24 years, overall and by HPV vaccination history, 2013–2016

Supplement Table 2: Human papillomavirus (HPV) prevalence and prevalence ratios, sexually experienced males aged 14–24 years overall and by vaccination history, 2013–2016

* This supplementary material was provided by the authors to give readers further details on their article. The material was not copyedited.

Supplement Figure 1: Participation and sample collection among females, National Health and Nutrition Examination Survey, 2003–2018



*The response rate during 2003–2004 and 2005–2006 was 80.0% and 80.9% for the interview portion and 76.0% and 77.8% for the examination portion, respectively

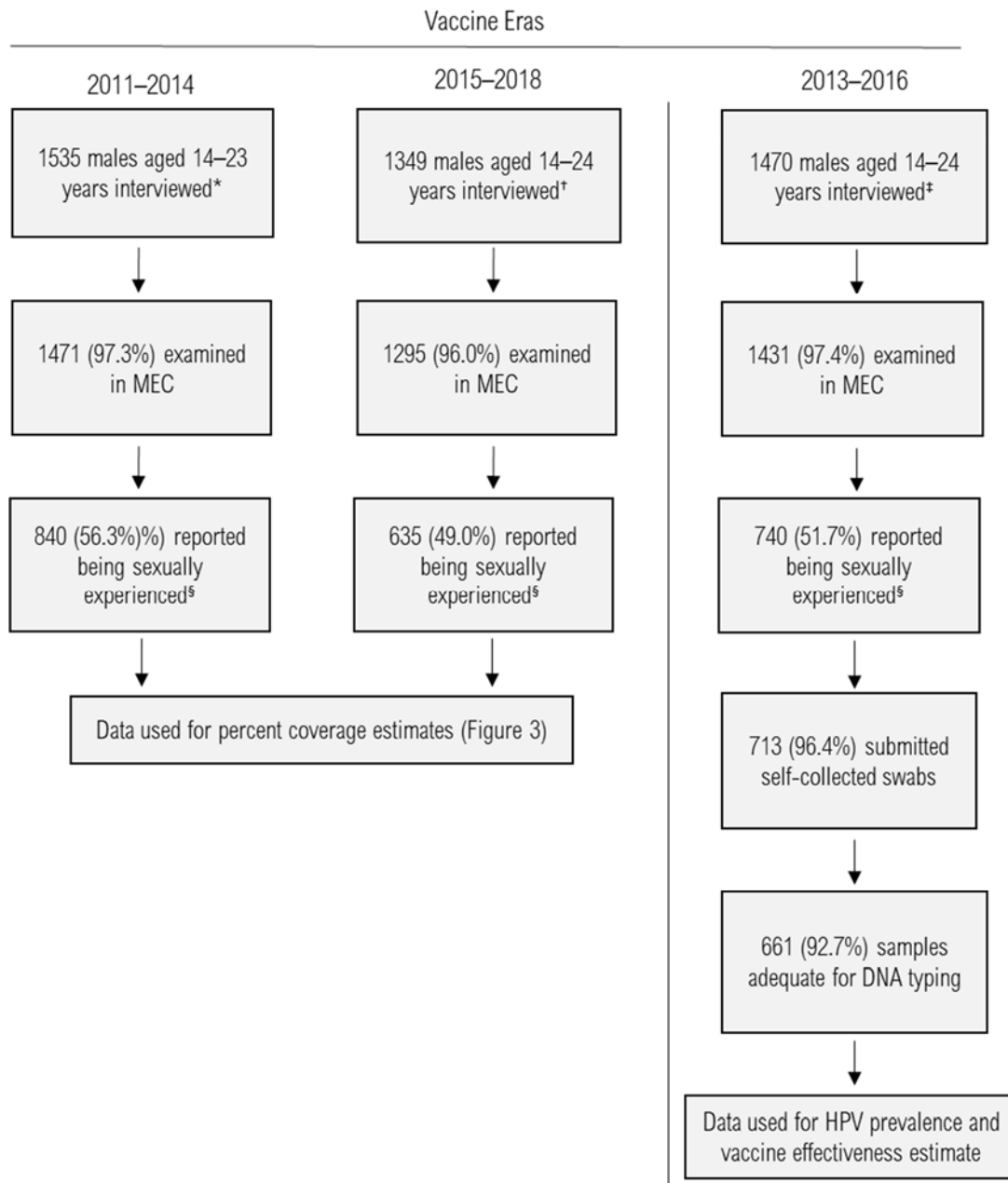
†The response rate during 2007–2008 and 2009–2010 among females 78.6% and 79.7% for the interview portion and 75.5% and 77.4% for the examination portion, respectively

‡The response rate during 2011–2012 and 2013–2014 among females was 72.6% and 71.4% for the interview portion and 69.4% and 68.8% for the examination portion, respectively

§The response rate during 2015–2016 and 2017–2018 among females was 62.6% and 53.5% for the interview portion and 60.0% and 50.5% for the examination portion, respectively

¶Information about sexual experience history available for 1986 females 2003–2006, 1248 for 2007–2010, 1370 for 2011–2014 and 1191 in 2015–2018

Supplement Figure 2: Participation and sample collection among males, National Health and Nutrition Examination Survey, 2011–2018



*The response rate during 2011–2012 and 2013–2014 among males was 72.7% and 70.6% for the interview portion and 69.6% and 68.1% for the examination portion, respectively

†The response rate during 2015–2016 and 2017–2018 among males was 60.1% and 50.3% for the interview portion and 57.4% and 47.2% for the examination portion, respectively

‡The response rate during 2013–2014 and 2015–2016 among males was 70.6% and 60.1% for the interview portion and 68.1% and 57.4% for the examination portion, respectively

§Information about sexual experience history available for 1402 males 2011–2014, 1196 for 2015–2018 and 1339 in 2013–2016

Supplement Table 1: Characteristics of sexually experienced males aged 14–24 years, overall and by HPV vaccination history, 2013–2016

Characteristic	% (95% CI)		
	Overall n= 661	Vaccinated n=124	Unvaccinated n= 431
HPV vaccination history			
≥1 dose	22.1 (18.5-26.3)	-	-
Vaccination age <15*	-	30.4 (21.1-41.6)	-
≥3 lifetime sex partners	65.1 (60.7-69.3)	59.4 (49.7-68.4)	67.3 (60.7-73.3)
Race ethnicity			
Non-Hispanic White	53.6 (46.2-60.8)	59.8 (47.0-71.3)	52.6 (45.3-59.7)
Non-Hispanic Black	15.6 (12.1-19.9)	14.5 (8.8-22.9)	16.2 (12.1-21.4)
Mexican American	14.4 (10.6-19.3)	11.7 (7.0-19.1)	14.2 (10.1-19.6)
Other races	16.3 (12.7-20.7)	14.0 (8.4-22.4)	17.0 (12.8-22.1)
Below poverty	22.7 (18.0-28.2)	17.7 (10.2-29.0)	25.4 (20.3-31.4)

*Among those vaccinated; refers to age at first dose

HPV = Human papillomavirus; CI = confidence interval

Note: All estimates are weighted using NHANES examination weights

Supplement Table 2: Human papillomavirus (HPV) prevalence and prevalence ratios, sexually experienced males aged 14–24 years overall and by vaccination history, 2013–2016

HPV types and vaccination history	Prevalence, % (95% CI)	Prevalence ratio (95% CI)
4vHPV*		
Overall	3.0 (1.8-4.9)	-
Vaccinated	1.8 (0.4-6.8) [§]	0.49 (0.11-2.20)
Unvaccinated	3.5 (1.9-6.4)	Ref
Non-4vHPV[†]		
Overall	33.7 (29.7-37.9)	-
Vaccinated	30.7 (21.5-41.8)	0.89 (0.58-1.37)
Unvaccinated	34.3 (29.1-40.0)	Ref
HPV31, 33, 45		
Overall	3.1 (1.9-5.0)	-
Vaccinated	6.0 (1.5-21.0) [§]	2.16 (0.37-12.50)
Unvaccinated	2.8 (1.4-5.5) [±]	Ref

*4vHPV= quadrivalent HPV vaccine types, HPV6,11,16,18

[†]Non-4vHPV: 33 types detected using Linear Array that are not HPV6,11,16, or 18

[±]Relative standard error 30-50%

[§]Relative standard error >50%

^{||}Reference

HPV = Human papillomavirus; CI = confidence interval

We use HPV nomenclature to be consistent with our past publications, however, nomenclature has evolved since the Roche product was launched. IS39 is a subtype of HPV82, HPV55 was reclassified as HPV44, and HPV64 was reclassified as HPV34

Note: All estimates are weighted using NHANES examination weights