



## Indicator 26: Shingles (Zoster) Vaccination - Ages 50+

Internal variable name: outc26\_shingles\_vacc

### Section 1: Definitions

Definition: Have you ever had the shingles or zoster vaccine?

### Section 2: Predictive models

	Mixed, demos only	Logit, no area effects	Mixed with area covariates
	b/se	b/se	b/se
Outcome 26: Shingles (Zoster) Vaccination - Ages 50+			
Non-Hispanic Black vs. Non-Hispanic White	-1.0009*** (0.1825)	-0.9761*** (0.1441)	-0.9761*** (0.1812)
Non-Hispanic Asian vs. Non-Hispanic White	-0.1173 (0.4402)	-0.2931 (0.5667)	-0.2931 (0.4407)
Non-Hispanic Other vs. Non-Hispanic White	-0.7277** (0.2278)	-0.6931** (0.2251)	-0.6931** (0.2280)
Hispanic vs. Non-Hispanic White	-0.5576 (0.3096)	-0.6522 (0.3543)	-0.6522* (0.3284)
Female	0.1050 (0.0711)	0.1163 (0.0835)	0.1163 (0.0707)
Age 45-54 vs. 65+	-2.2387*** (0.1458)	-2.3215*** (0.1784)	-2.3215*** (0.1435)
Age 55-64 vs. 65+	-1.1245*** (0.0803)	-1.1609*** (0.0893)	-1.1609*** (0.0828)
% education Bachelor+, population 25+ years old		0.0168* (0.0068)	0.0168* (0.0065)
Average aggregate household income per occupied housing unit in the ACS		-0.0076 (0.0049)	-0.0076 (0.0040)
% below 1.5x poverty line		-0.0217* (0.0091)	-0.0217** (0.0073)
Uterus Cancer Female Rate		0.0057 (0.0048)	0.0057 (0.0047)
Crude mortality rate of Accidents (unintentional) per 10,000		-0.1288*** (0.0317)	-0.1288*** (0.0278)
Breast Cancer Male Rate		-0.0416 (0.0381)	-0.0416 (0.0270)
{Breast Cancer Male Rate}		0.0019* (0.0019)	0.0019** (0.0019)

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interacted with {Uterus Cancer Female Rate}		(0.0009)	(0.0006)
% crowded housing > 1.01 occupants per room		-0.0396 (0.0474)	-0.0396 (0.0272)
% population in urban areas		0.0003 (0.0055)	0.0003 (0.0035)
{% crowded housing > 1.01 occupants per room}		0.0042 (0.0032)	0.0042* (0.0021)
interacted with {% population in urban areas}		0.6051 (0.4397)	0.6051 (0.3553)
Intercept	-0.3357*** (0.0741)	0.6051 (0.4397)	0.6051 (0.3553)
Area effect variance	0.0105 (0.0263)		0.0000 (0.0000)

Number of alternative models used to estimate model error = 15.



### Section 3: Results

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE 95% CI
Augusta County	51015	22.8%	(14.9%, 33.3%)	30.1%	(26.9%, 33.5%)
Bath County	51017	12.3%	(2.2%, 58.0%)	15.7%	(11.0%, 21.9%)
Caroline County	51033	18.0%	(5.6%, 45.1%)	30.6%	(26.7%, 34.8%)
Clarke County	51043	24.3%	(7.8%, 55.1%)	30.2%	(25.1%, 35.9%)
Culpeper County	51047	16.4%	(6.8%, 34.5%)	29.8%	(25.0%, 35.2%)
Fauquier County	51061	25.0%	(15.5%, 37.8%)	27.2%	(23.8%, 30.8%)
Frederick County	51069	22.7%	(13.8%, 34.8%)	28.6%	(26.0%, 31.3%)
Highland County	51091	0.0%	(0.0%, 87.8%)	23.9%	(19.3%, 29.1%)
King George County	51099	12.3%	(3.7%, 49.3%)	29.2%	(25.5%, 33.3%)
Madison County	51113	6.5%	(2.6%, 33.6%)	24.0%	(21.3%, 26.9%)
Orange County	51137	17.9%	(8.5%, 34.0%)	22.3%	(16.3%, 29.8%)
Page County	51139	21.5%	(8.8%, 51.9%)	27.5%	(23.9%, 31.4%)
Rappahannock County	51157	20.5%	(4.3%, 60.0%)	24.7%	(21.4%, 28.3%)
Rockbridge County	51163	21.6%	(10.4%, 43.6%)	29.4%	(27.0%, 31.9%)
Rockingham County	51165	17.9%	(10.4%, 29.1%)	31.2%	(28.1%, 34.5%)
Shenandoah County	51171	37.6%	(22.2%, 56.0%)	25.0%	(21.6%, 28.7%)
Spotsylvania County	51177	19.3%	(10.7%, 32.3%)	27.7%	(24.7%, 30.9%)
Stafford County	51179	14.5%	(8.1%, 26.5%)	32.6%	(28.7%, 36.8%)
Warren County	51187	34.9%	(18.6%, 55.8%)	32.7%	(27.8%, 38.1%)
Buena Vista City	51530	0.0%	(0.0%, 99.4%)	34.6%	(20.8%, 51.5%)
Fredericksburg City	51630	25.5%	(7.4%, 59.4%)	38.8%	(31.1%, 47.2%)
Harrisonburg City	51660	0.0%	(0.0%, 65.0%)	24.6%	(19.7%, 30.2%)
Lexington City	51678	0.0%	(0.0%, 99.4%)	49.1%	(30.3%, 68.2%)
Staunton City	51790	30.2%	(6.1%, 74.2%)	29.4%	(26.1%, 32.9%)
Waynesboro City	51820	12.6%	(3.4%, 66.2%)	29.9%	(25.6%, 34.5%)
Winchester City	51840	5.8%	(1.9%, 48.0%)	21.0%	(17.6%, 24.9%)

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County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE 95% CI
Albemarle County	51003	27.1%	(18.2%, 38.3%)	36.8%	(30.8%, 43.2%)
Alleghany County	51005	24.2%	(11.6%, 43.8%)	22.4%	(18.1%, 27.3%)
Amherst County	51009	23.7%	(9.4%, 48.4%)	30.7%	(27.5%, 33.9%)
Appomattox County	51011	45.4%	(23.0%, 69.7%)	53.7%	(42.6%, 64.5%)
Arlington City	51013	39.2%	(27.2%, 52.6%)	44.8%	(39.8%, 49.9%)
Bedford County	51019	32.4%	(21.2%, 46.2%)	27.5%	(24.4%, 30.8%)
Botetourt County	51023	21.0%	(9.6%, 39.9%)	27.2%	(24.1%, 30.6%)
Campbell County	51031	11.7%	(4.3%, 28.0%)	29.1%	(26.3%, 32.1%)
Craig County	51045	0.0%	(0.0%, 95.3%)	26.2%	(20.8%, 32.4%)
Fairfax County	51059	26.5%	(19.8%, 34.6%)	33.9%	(30.7%, 37.4%)
Fluvanna County	51065	39.2%	(18.2%, 65.2%)	38.1%	(32.6%, 44.1%)
Greene County	51079	29.5%	(9.8%, 61.8%)	38.5%	(32.8%, 44.5%)
Loudoun County	51107	31.4%	(22.3%, 42.2%)	38.8%	(35.0%, 42.7%)
Louisa County	51109	28.7%	(14.1%, 49.9%)	28.9%	(25.9%, 32.0%)
Nelson County	51125	21.7%	(7.5%, 48.5%)	24.7%	(21.0%, 28.9%)
Prince William County	51153	25.2%	(18.4%, 33.5%)	29.1%	(25.3%, 33.2%)
Roanoke County	51161	21.6%	(15.3%, 29.6%)	26.0%	(21.8%, 30.6%)
Alexandria City	51510	27.0%	(17.7%, 38.8%)	37.7%	(34.4%, 41.2%)
Charlottesville City	51540	34.6%	(10.7%, 69.9%)	37.4%	(31.9%, 43.3%)
Covington City	51580	.%	(.%, .%)	25.0%	(15.0%, 38.7%)
Fairfax City	51600	22.6%	(11.8%, 39.1%)	30.4%	(25.7%, 35.5%)
Falls Church City	51610	24.4%	(4.7%, 67.8%)	51.0%	(44.7%, 57.3%)
Lynchburg City	51680	29.5%	(14.1%, 51.7%)	30.8%	(27.0%, 34.8%)
Manassas City	51683	28.7%	(5.2%, 74.9%)	24.5%	(18.2%, 32.1%)
Manassas Park City	51685	.%	(.%, .%)	26.4%	(20.8%, 33.0%)
Salem City	51775	25.4%	(5.6%, 66.0%)	27.8%	(24.0%, 32.0%)

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County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE 95% CI
Bland County	51021	25.1%	(3.1%, 78.0%)	25.6%	(22.5%, 28.9%)
Buchanan County	51027	8.0%	(2.2%, 24.6%)	17.2%	(13.5%, 21.6%)
Carroll County	51035	5.9%	(1.5%, 20.8%)	16.5%	(13.0%, 20.8%)
Dickenson County	51051	34.9%	(15.8%, 60.6%)	40.5%	(30.0%, 52.0%)
Floyd County	51063	26.4%	(10.5%, 52.2%)	25.6%	(21.6%, 30.0%)
Franklin County	51067	18.1%	(9.2%, 32.5%)	25.0%	(22.7%, 27.5%)
Giles County	51071	35.8%	(18.0%, 58.7%)	32.2%	(28.0%, 36.7%)
Grayson County	51077	21.1%	(7.2%, 47.7%)	22.4%	(17.8%, 27.8%)
Henry County	51089	16.9%	(9.8%, 27.7%)	17.5%	(14.0%, 21.7%)
Lee County	51105	9.4%	(2.5%, 29.2%)	16.3%	(13.0%, 20.2%)
Montgomery County	51121	31.1%	(20.9%, 43.7%)	40.1%	(34.8%, 45.8%)
Patrick County	51141	32.0%	(16.4%, 53.0%)	13.7%	(10.8%, 17.1%)
Pittsylvania County	51143	16.2%	(10.7%, 23.6%)	23.3%	(21.2%, 25.6%)
Pulaski County	51155	16.1%	(8.9%, 31.0%)	18.9%	(14.8%, 23.7%)
Russell County	51167	21.5%	(9.4%, 42.0%)	21.8%	(19.0%, 25.0%)
Scott County	51169	19.0%	(10.0%, 33.1%)	21.2%	(18.0%, 24.8%)
Smyth County	51173	20.0%	(7.4%, 43.9%)	24.8%	(21.7%, 28.1%)
Tazewell County	51185	20.4%	(11.0%, 34.6%)	21.4%	(17.6%, 25.8%)
Washington County	51191	15.3%	(7.7%, 28.0%)	26.3%	(22.9%, 29.9%)
Wise County	51195	15.4%	(8.3%, 26.8%)	20.7%	(17.7%, 23.9%)
Wythe County	51197	21.0%	(9.9%, 39.2%)	25.2%	(19.8%, 31.6%)
Bristol City	51520	25.7%	(3.0%, 79.3%)	23.8%	(20.3%, 27.7%)
Danville City	51590	18.2%	(6.0%, 43.7%)	27.8%	(20.6%, 36.3%)
Galax City	51640	57.6%	(3.2%, 98.2%)	38.4%	(23.3%, 56.0%)
Martinsville City	51690	0.0%	(0.0%, 76.4%)	9.8%	(3.8%, 23.2%)
Norton City	51720	30.8%	(2.5%, 89.7%)	26.7%	(16.5%, 40.1%)
Radford City	51750	60.9%	(3.4%, 98.5%)	26.7%	(18.9%, 36.3%)
Roanoke City	51770	15.9%	(9.5%, 25.4%)	25.9%	(23.0%, 29.1%)

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County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE 95% CI
Amelia County	51007	23.4%	(6.9%, 55.8%)	17.5%	(13.0%, 23.1%)
Brunswick County	51025	9.2%	(1.4%, 41.3%)	16.2%	(13.6%, 19.1%)
Buckingham County	51029	34.6%	(14.2%, 62.8%)	19.1%	(15.7%, 23.0%)
Charles City County	51036	26.5%	(6.0%, 67.3%)	28.8%	(23.8%, 34.4%)
Charlotte County	51037	15.6%	(4.6%, 41.3%)	20.8%	(18.6%, 23.2%)
Chesterfield County	51041	26.7%	(20.0%, 34.8%)	31.9%	(29.0%, 34.9%)
Cumberland County	51049	13.9%	(6.3%, 43.0%)	21.1%	(18.6%, 23.8%)
Dinwiddie County	51053	27.6%	(13.5%, 48.3%)	19.8%	(17.0%, 22.9%)
Goochland County	51075	21.7%	(10.2%, 45.1%)	31.0%	(27.0%, 35.2%)
Greensville County	51081	11.5%	(1.6%, 50.7%)	19.2%	(14.8%, 24.4%)
Halifax County	51083	9.2%	(5.9%, 23.2%)	15.6%	(13.1%, 18.4%)
Hanover County	51085	25.4%	(17.0%, 36.1%)	32.7%	(29.5%, 36.1%)
Henrico County	51087	25.6%	(19.5%, 32.9%)	30.5%	(27.3%, 34.0%)
Lunenburg County	51111	13.1%	(2.9%, 43.4%)	17.2%	(14.5%, 20.3%)
Mecklenburg County	51117	22.1%	(12.2%, 36.7%)	20.7%	(17.8%, 23.9%)
New Kent County	51127	22.8%	(8.0%, 49.9%)	31.4%	(27.7%, 35.4%)
Nottoway County	51135	31.1%	(14.7%, 54.1%)	29.2%	(22.3%, 37.2%)
Powhatan County	51145	21.9%	(3.6%, 67.7%)	23.3%	(19.7%, 27.4%)
Prince Edward County	51147	22.1%	(7.1%, 51.3%)	29.4%	(24.7%, 34.6%)
Prince George County	51149	24.1%	(10.3%, 46.7%)	25.7%	(21.9%, 29.8%)
Surry County	51181	4.0%	(1.2%, 63.9%)	21.3%	(17.4%, 25.8%)
Sussex County	51183	4.4%	(2.2%, 31.7%)	13.7%	(11.0%, 17.1%)
Colonial Heights City	51570	21.2%	(2.4%, 74.7%)	24.4%	(21.6%, 27.4%)
Emporia City	51595	37.5%	(2.9%, 92.3%)	29.2%	(20.2%, 40.3%)
Hopewell City	51670	47.6%	(23.1%, 73.3%)	32.5%	(26.2%, 39.6%)
Petersburg City	51730	11.1%	(5.2%, 31.2%)	16.8%	(14.2%, 19.7%)
Richmond City	51760	17.5%	(11.6%, 25.6%)	21.4%	(18.7%, 24.4%)

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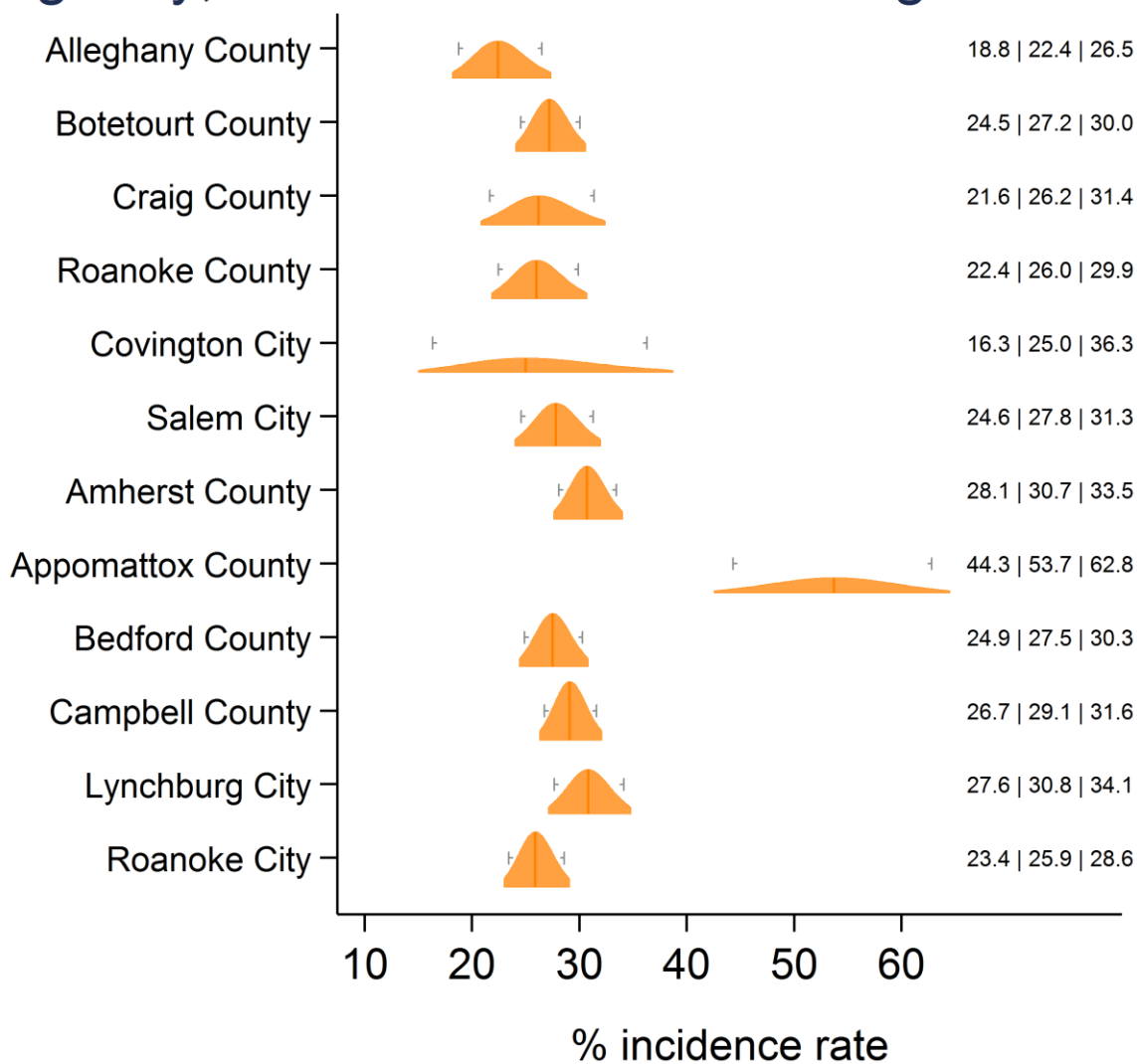


County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE 95% CI
Accomack County	51001	15.3%	(8.1%, 26.8%)	20.1%	(17.7%, 22.7%)
Essex County	51057	50.4%	(22.5%, 78.0%)	25.2%	(20.5%, 30.6%)
Gloucester County	51073	15.0%	(7.4%, 35.7%)	26.1%	(22.6%, 30.0%)
Isle of Wight County	51093	31.0%	(15.5%, 52.5%)	28.0%	(24.5%, 31.7%)
James City County	51095	42.8%	(28.2%, 58.7%)	33.0%	(28.0%, 38.4%)
King and Queen County	51097	0.0%	(-0.0%, 81.4%)	17.7%	(15.0%, 20.8%)
King William County	51101	31.9%	(10.2%, 65.7%)	28.5%	(23.6%, 33.9%)
Lancaster County	51103	33.9%	(13.5%, 62.9%)	29.2%	(26.7%, 31.7%)
Mathews County	51115	20.6%	(8.8%, 44.9%)	25.5%	(22.3%, 29.0%)
Middlesex County	51119	31.0%	(5.7%, 77.0%)	21.8%	(18.6%, 25.5%)
Northampton County	51131	13.4%	(8.2%, 32.0%)	13.9%	(10.9%, 17.6%)
Northumberland County	51133	28.1%	(11.8%, 53.4%)	27.0%	(23.2%, 31.1%)
Richmond County	51159	8.7%	(4.3%, 31.8%)	15.8%	(12.3%, 20.0%)
Southampton County	51175	9.3%	(4.0%, 45.6%)	20.0%	(16.6%, 23.9%)
Westmoreland County	51193	11.1%	(3.2%, 31.5%)	17.6%	(14.3%, 21.4%)
York County	51199	22.2%	(12.4%, 36.5%)	37.4%	(33.3%, 41.6%)
Chesapeake City	51550	26.7%	(19.0%, 36.1%)	28.0%	(25.2%, 30.9%)
Franklin City	51620	22.8%	(9.3%, 46.0%)	19.1%	(13.4%, 26.4%)
Hampton City	51650	16.8%	(10.6%, 25.8%)	21.6%	(17.9%, 25.8%)
Newport News City	51700	22.9%	(13.7%, 35.6%)	25.0%	(22.6%, 27.6%)
Norfolk City	51710	22.0%	(16.1%, 29.3%)	22.9%	(20.6%, 25.5%)
Poquoson City	51735	37.5%	(5.7%, 85.5%)	38.7%	(34.0%, 43.6%)
Portsmouth City	51740	20.1%	(12.5%, 30.6%)	21.8%	(19.6%, 24.2%)
Suffolk City	51800	31.2%	(19.5%, 46.0%)	26.5%	(23.8%, 29.4%)
Virginia Beach City	51810	28.6%	(21.6%, 36.8%)	32.1%	(28.7%, 35.7%)
Williamsburg City	51830	79.5%	(29.8%, 95.5%)	61.0%	(50.7%, 70.4%)



Section 4: Graphical representation

## Lifetime shingles vaccination Alleghany, Roanoke and Central Virginia HDs

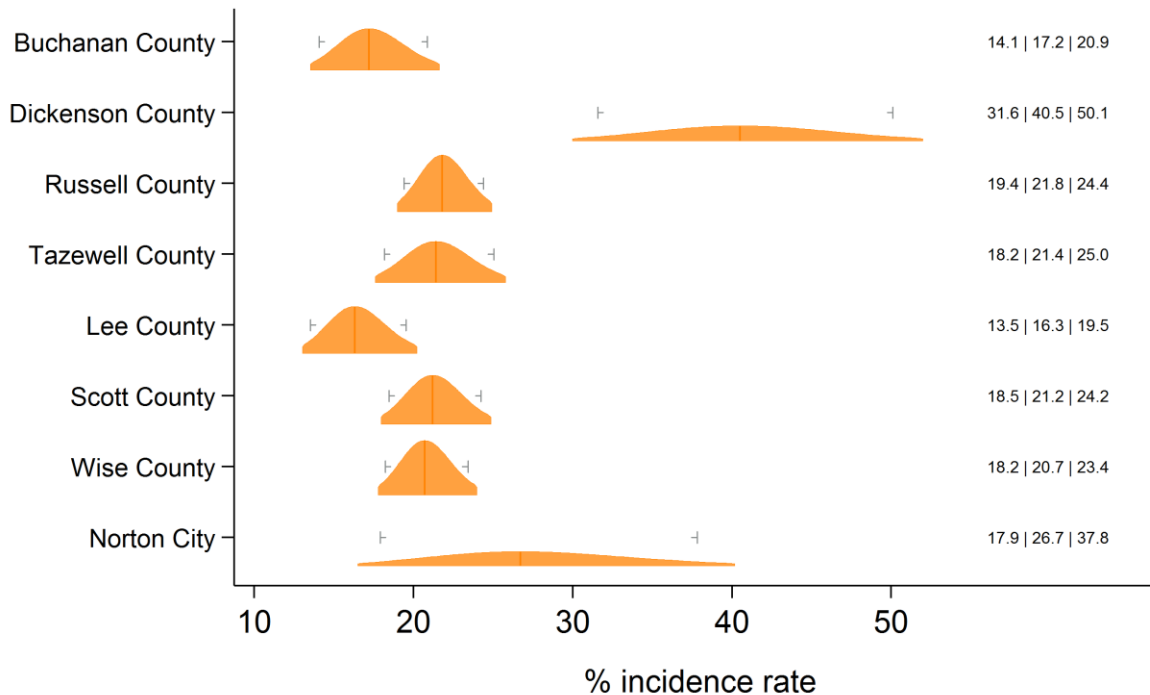


Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval





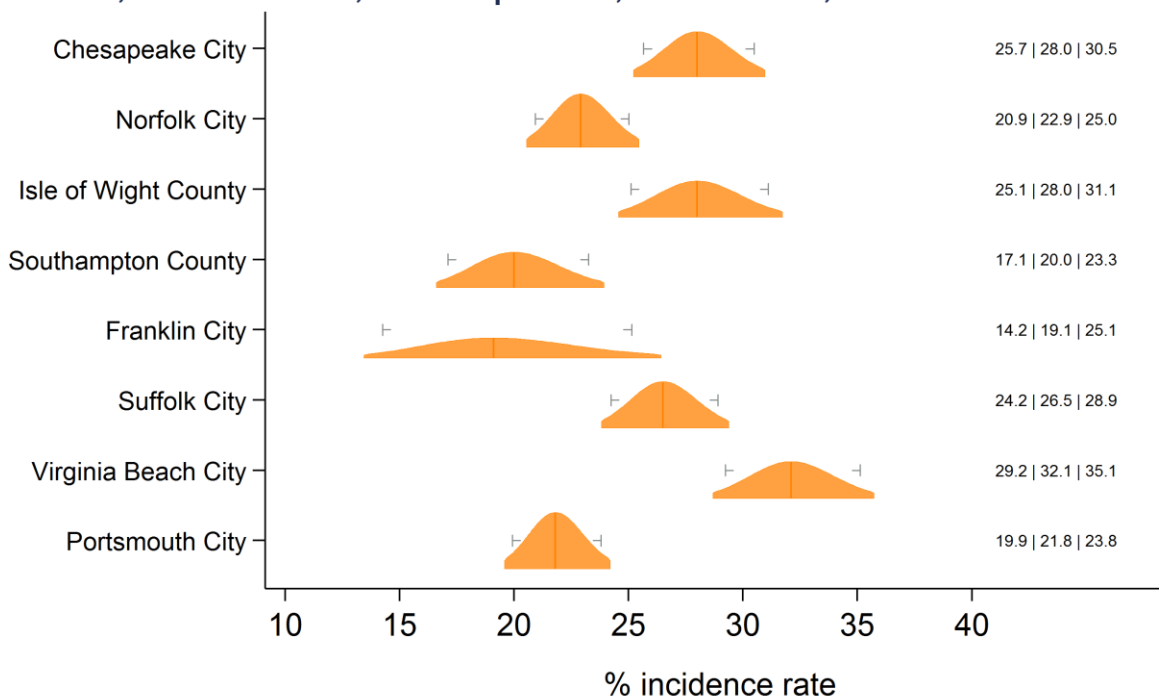
### Lifetime shingles vaccination Cumberland Plateau and Lenowisco HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



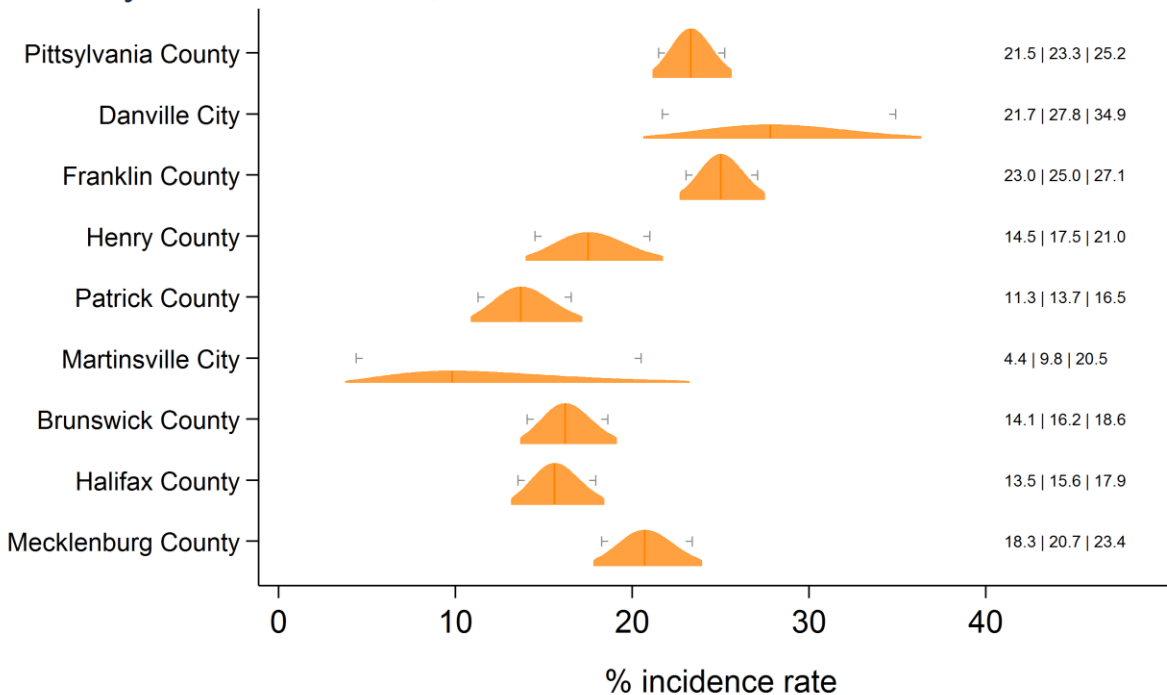
### Lifetime shingles vaccination Norfolk, Portsmouth, Chesapeake, VA Beach, W. Tidewater HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



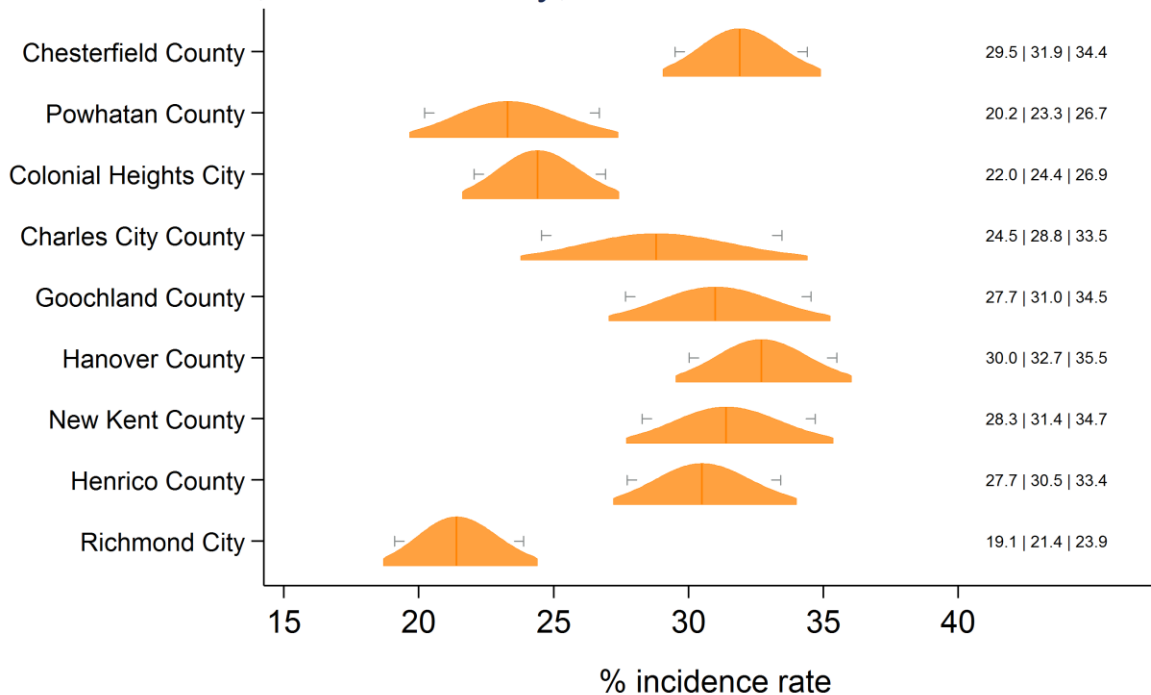
### Lifetime shingles vaccination Pittsylvania/Danville, Southside and West Piedmont HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



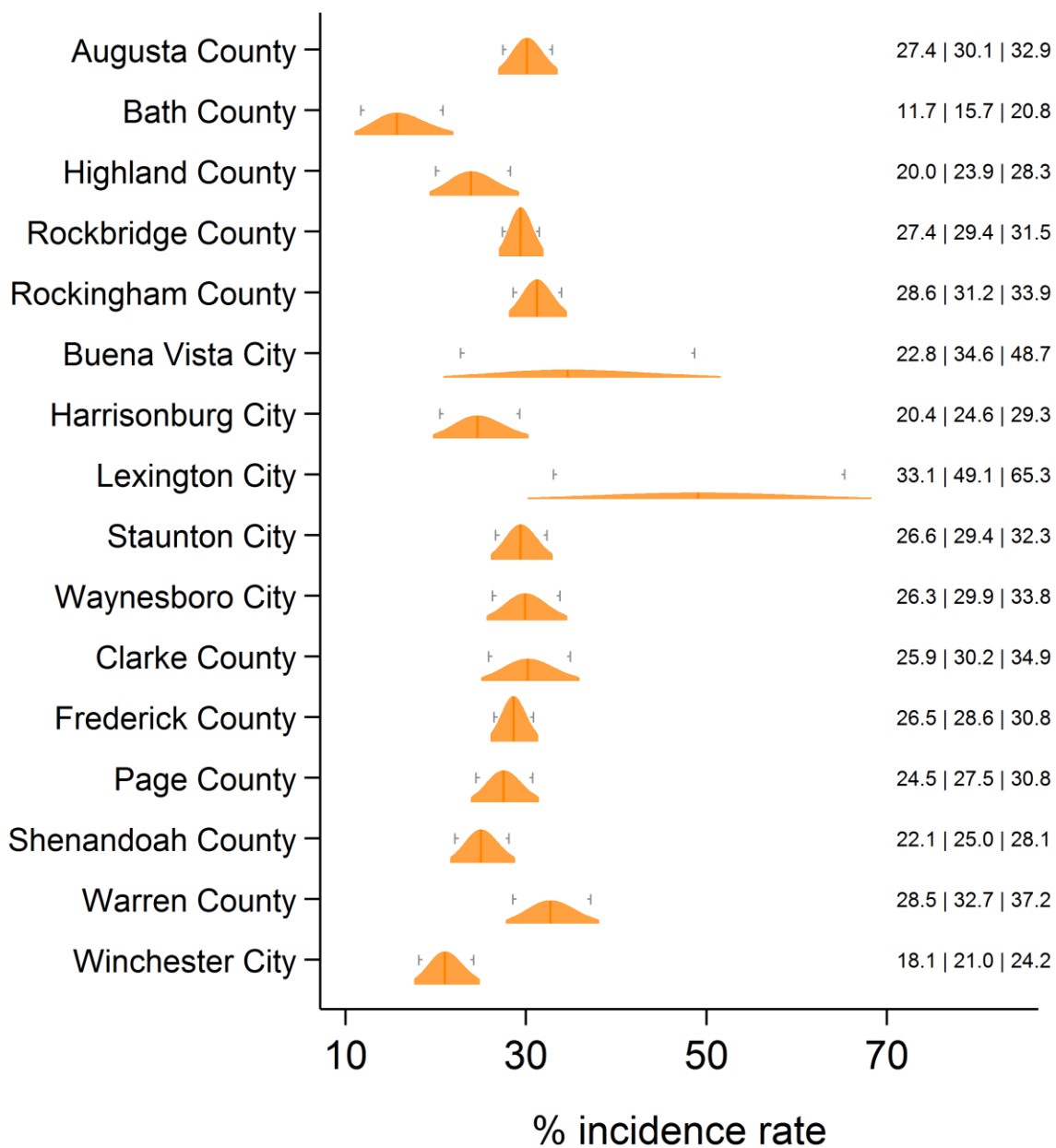
### Lifetime shingles vaccination Chesterfield, Chickahominy, Henrico and Richmond HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



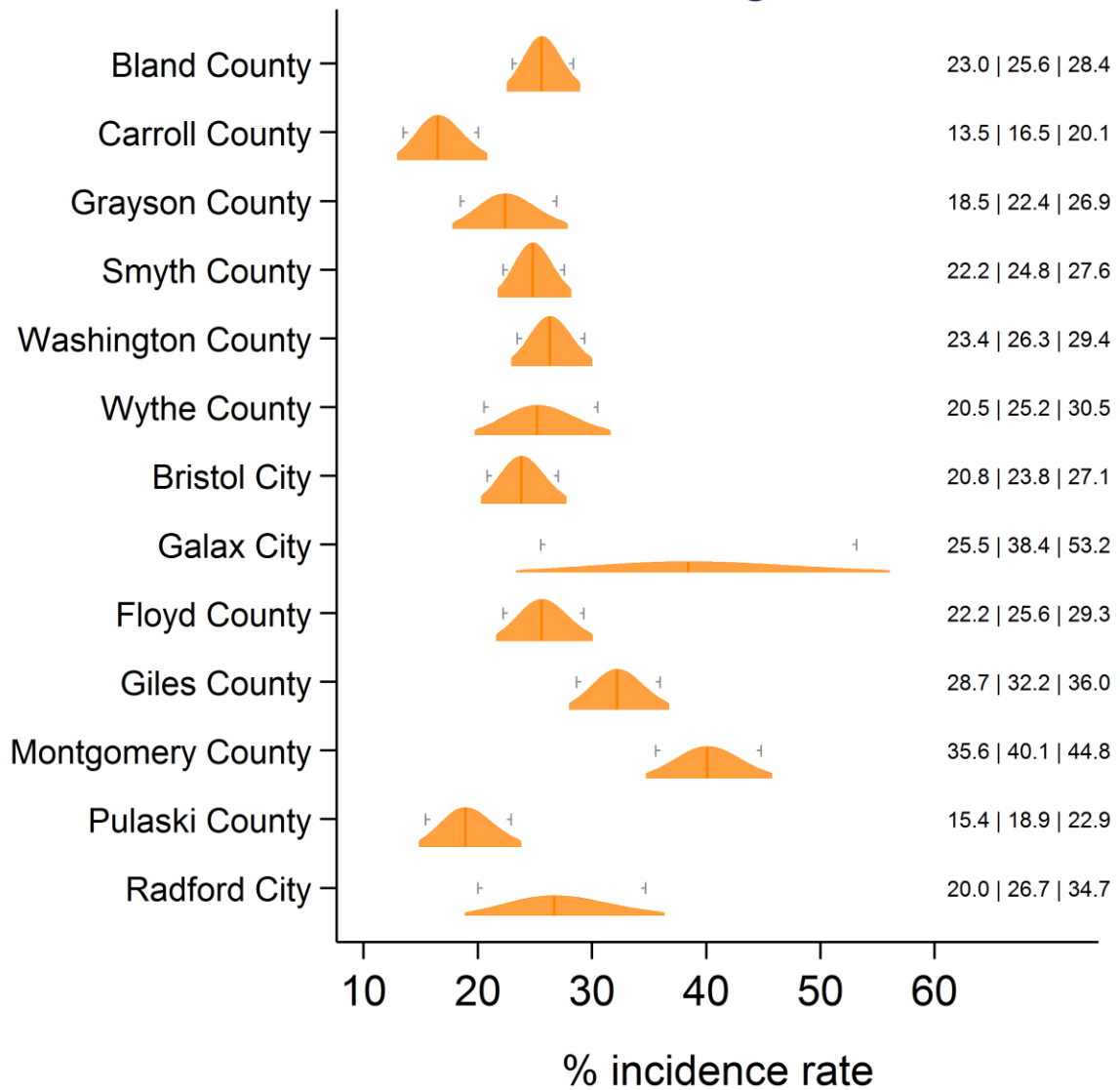
## Lifetime shingles vaccination Central Shenandoah and Lord Fairfax HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



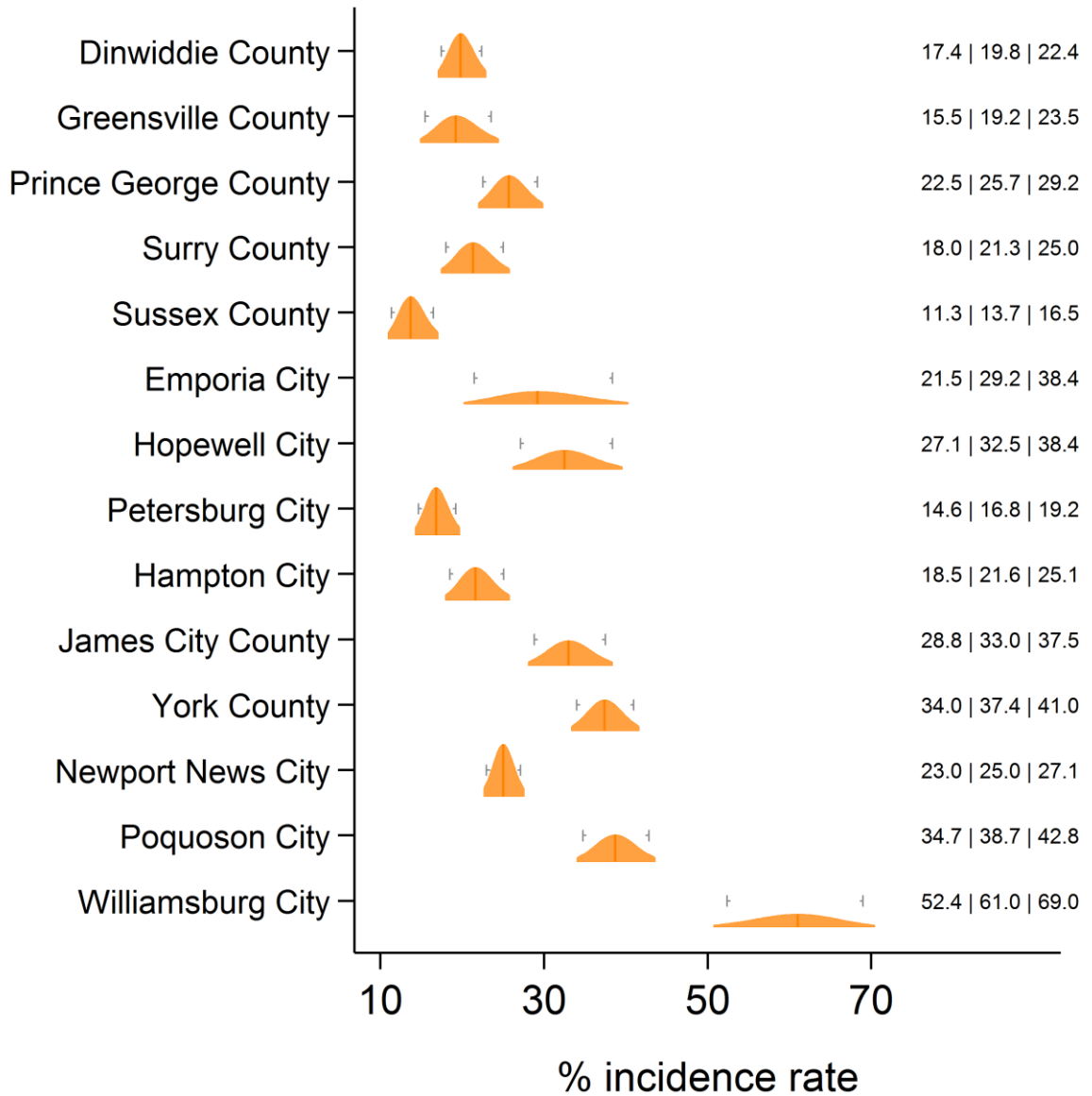
## Lifetime shingles vaccination New River and Mount Rogers HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



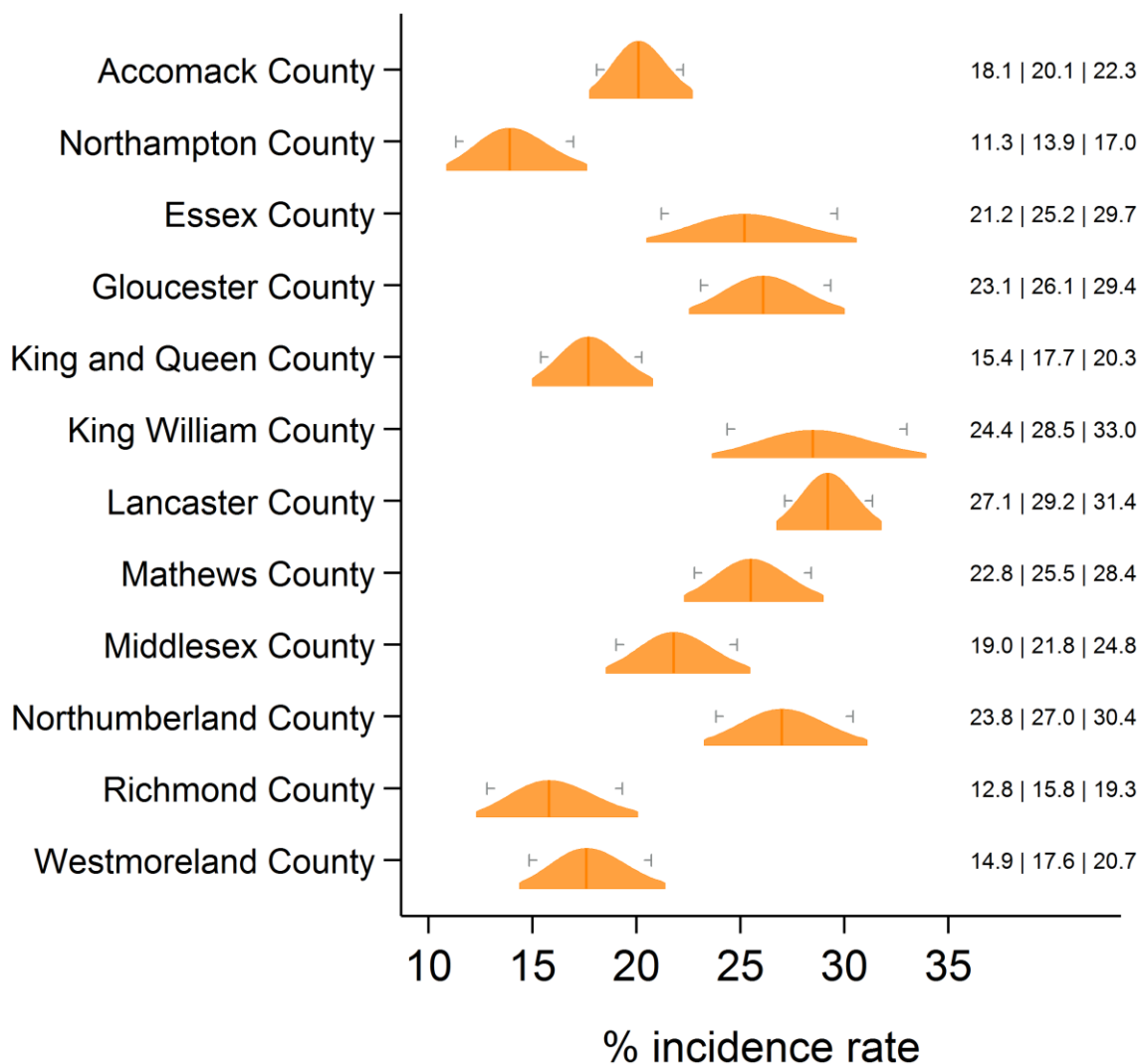
## Lifetime shingles vaccination Crater, Peninsula and Hampton HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



## Lifetime shingles vaccination Eastern Shore and Three Rivers HDs

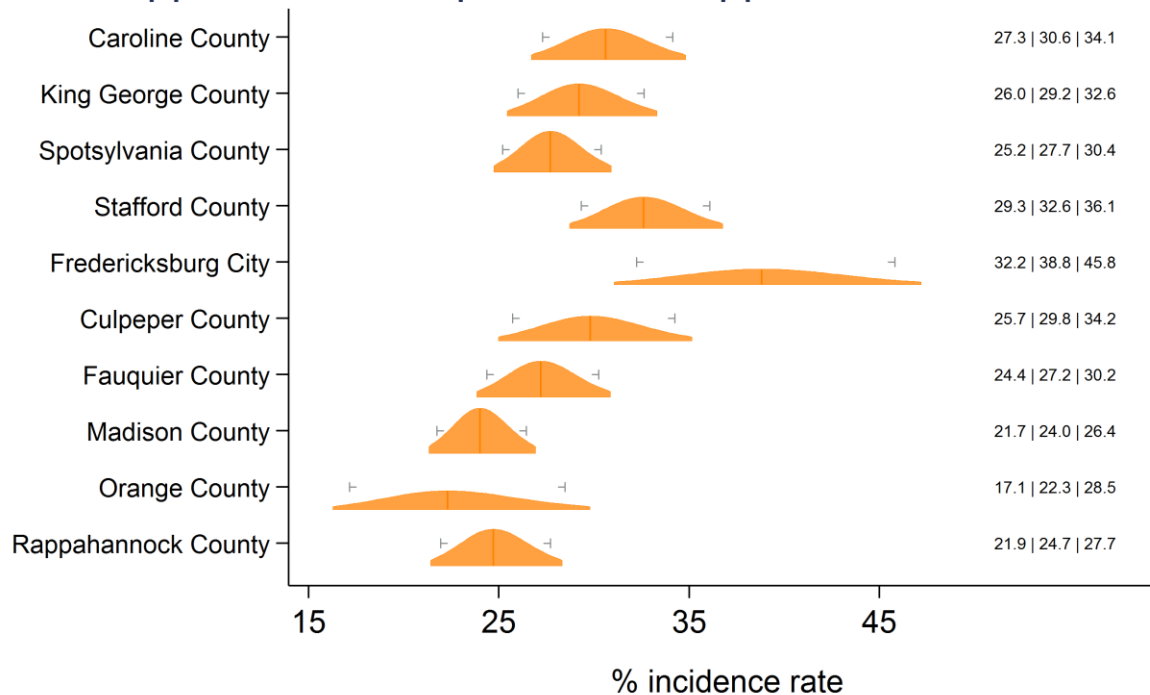


Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval





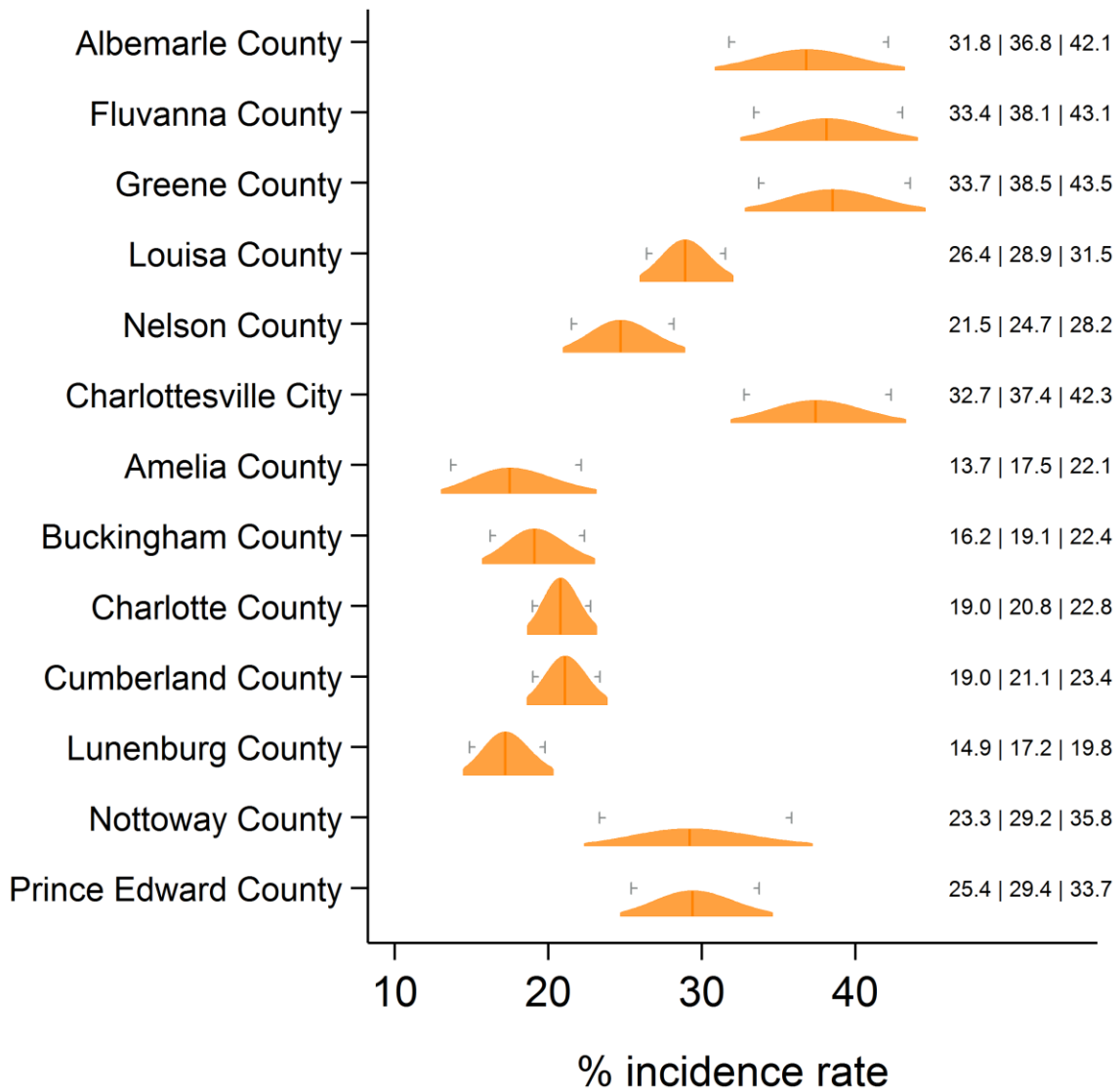
## Lifetime shingles vaccination Rappahannock/Rapidan and Rappahannock HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



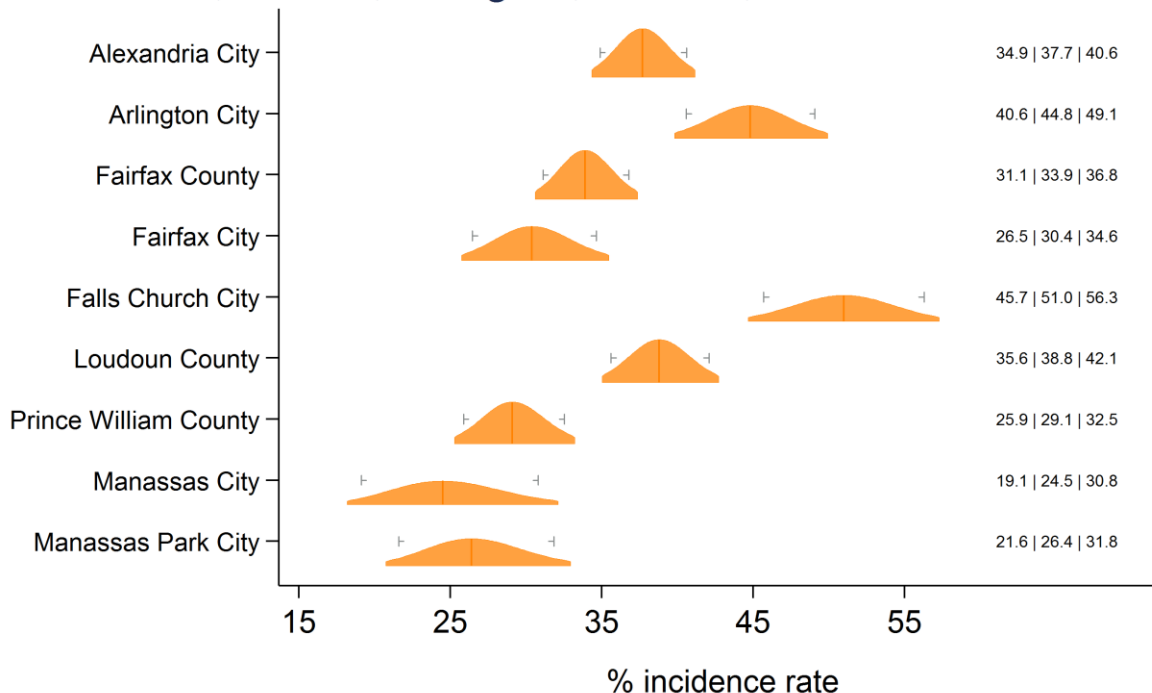
## Lifetime shingles vaccination Thomas Jefferson and Piedmont HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



### Lifetime shingles vaccination Alexandria, Fairfax, Arlington, Loudon, Prince William HDs



Text at right: 1-sided 95% LCB | Point Estimate | 1-sided 95% UCB  
 Gray markers: 90% confidence interval



## Section 5: Additional diagnostics

Direct estimate is inside the 95% SAE Wilson CI: 43 areas.

Direct estimate is outside the 95% SAE Wilson CI: 90 areas.

SAE estimate is inside the 95% direct Wilson CI: 127 areas.

SAE estimate is outside the 95% direct Wilson CI: 6 areas.

SAE Wilson 95% CI is fully inside the 95% direct Wilson CI: 108 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 25 areas.

SAE Wilson 95% CI and the 95% direct Wilson CI do not overlap: 0 areas.

SAE standard error is less than the direct standard error: 124 areas.

SAE standard error is greater than the (nonzero) direct standard error: 0 areas.

Direct standard error is zero: 9 areas.

Proportion of SAE variance due to ACS sampling error: min = 0.13%; med = 4.97%; max = 19.04%.

Proportion of SAE variance to sampling error in regression coefficient estimates: min = 71.11%; med = 91.08%; max = 97.86%.

Proportion of SAE variance due to model selection: min = 0.08%; med = 2.67%; max = 23.33%.