

## Outcome 31: Shingles (Zoster) Vaccination - Ages 50+

Internal variable name: outc31\_shingles\_vacc

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

### Predictive models

	Mixed, demos only	Logit, no area effects	Mixed with area covariates
	b/se	b/se	b/se
Outcome 31: Shingles (Zoster) Vaccination - Ages 50+			
NH White	0.0000 (.)	0.0000 (.)	0.0000 (.)
NH Black vs. NH White	-0.7894*** (0.1566)	-0.7456*** (0.1325)	-0.7456*** (0.1647)
NH Asian vs. NH White	0.0815 (0.2302)	-0.0314 (0.3410)	-0.0315 (0.2242)
NH Other vs. NH White	-0.6520*** (0.1823)	-0.6873*** (0.2006)	-0.6875*** (0.1742)
Hispanic vs. NH White	-0.4225 (0.2483)	-0.5826* (0.2819)	-0.5823* (0.2651)
SEX OF RESPONDENT=1	0.0000 (.)	0.0000 (.)	0.0000 (.)
Female	0.1235 (0.0700)	0.1269 (0.0817)	0.1269 (0.0702)
Age 18-34 vs. 65+	0.0000 (.)		0.0000 (.)
Age 35-44 vs. 65+	0.0000 (.)		0.0000 (.)
Age 45-54 vs. 65+	-1.9791*** (0.1895)	-2.0155*** (0.1504)	-2.0155*** (0.1905)
Age 55-64 vs. 65+	-1.0889*** (0.0949)	-1.0985*** (0.0896)	-1.0985*** (0.0979)
65+	0.0000 (.)	0.0000 (.)	0.0000 (.)
VA BRFSS 2014 SAE outc19_binge_drink		18.4156 (9.9727)	18.4290* (7.7187)
VA BRFSS 2017 SAE outc36_flu_vacc		2.3903 (6.2528)	2.3839 (4.9583)
VA BRFSS 2014 SAE		-32.3730	-32.4033

outc19_binge_drink # VA BRFSS 2017 SAE outc36_flu_vacc			
		(21.0004)	(16.6190)
VA BRFSS 2017 SAE outc36_flu_vacc		0.0000	
		(.)	
VA BRFSS 2014 SAE outc29_pay_mortgage		5.3143	5.3266
		(8.2371)	(6.8941)
VA BRFSS 2014 SAE outc30_pay_food		7.6698	7.6703
		(6.0184)	(5.2045)
VA BRFSS 2014 SAE outc29_pay_mortgage # VA BRFSS 2014 SAE outc30_pay_food		-16.8650	-16.8673
		(11.6048)	(10.2679)
VA BRFSS 2014 SAE outc29_pay_mortgage		0.0000	
		(.)	
VA BRFSS 2017 SAE outc3_oweight_obese		-0.8836	-0.8753
		(6.6924)	(5.6910)
VA BRFSS 2014 SAE outc29_pay_mortgage # VA BRFSS 2017 SAE outc3_oweight_obese		0.6224	0.6066
		(13.1383)	(11.6884)
VA BRFSS 2017 SAE outc31_shingles_vacc		-6.4171	-6.4312
		(8.6946)	(6.4085)
VA BRFSS 2017 SAE outc31_shingles_vacc # VA BRFSS 2017 SAE outc36_flu_vacc		13.2021	13.2334
		(18.1322)	(13.4219)
VA BRFSS 2017 SAE outc36_flu_vacc		0.0000	
		(.)	
Physical environment z- score, County Rankings		15.9189*	15.9250**
		(7.0010)	(5.4575)
VA BRFSS 2017 SAE outc31_shingles_vacc		0.0000	
		(.)	
Physical environment z-		-48.6287*	-48.6471**

score, County Rankings # VA BRFSS 2017 SAE outc31_shingles_vacc			
		(19.7826)	(14.9175)
Preventable Hospitalization Rate - Z Score, County Rankings/CMS - Mapping Medica		0.2490	0.2488
		(0.4377)	(0.3286)
Preventable Hospitalization Rate - Z Score, County Rankings/CMS - Mapping Medica # VA BRFSS 2017 SAE outc36_flu_vacc		-0.6117	-0.6112
		(0.9353)	(0.7039)
_cons	0.1194	-3.5051	-3.5084
	(0.0782)	(4.8803)	(3.9386)
Area effect variance			
var(_cons[FIPS_county])	0.0207		0.0000
	(0.0193)		(0.0000)

Number of alternative models used to estimate model error = 5.

## Results by health districts

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Augusta County	51015	35.6%	(25.0%, 47.9%)	41.4%	(38.0%, 44.9%)
Bath County	51017	30.3%	(7.4%, 70.3%)	60.9%	(46.2%, 73.9%)
Caroline County	51033	27.7%	(10.7%, 60.5%)	33.1%	(28.8%, 37.8%)
Clarke County	51043	29.8%	(11.2%, 58.9%)	38.3%	(33.2%, 43.8%)
Culpeper County	51047	40.5%	(20.7%, 64.0%)	40.9%	(36.9%, 45.1%)
Fauquier County	51061	29.0%	(17.3%, 44.3%)	41.9%	(38.6%, 45.3%)
Frederick County	51069	23.0%	(12.4%, 38.8%)	38.2%	(34.0%, 42.5%)
Highland County	51091	75.6%	(38.1%, 94.0%)	69.8%	(57.1%, 80.0%)
King George County	51099	29.0%	(9.0%, 62.6%)	41.8%	(36.9%, 46.9%)
Madison County	51113	18.3%	(6.4%, 53.3%)	41.5%	(37.8%, 45.4%)
Orange County	51137	18.5%	(6.6%, 42.4%)	40.8%	(36.2%, 45.5%)
Page County	51139	49.8%	(23.1%, 76.7%)	30.9%	(24.3%, 38.5%)
Rappahannock County	51157	26.1%	(6.8%, 68.0%)	26.6%	(18.6%, 36.4%)
Rockbridge County	51163	30.9%	(15.3%, 52.5%)	50.5%	(47.5%, 53.5%)
Rockingham County	51165	38.6%	(27.0%, 51.8%)	38.9%	(34.1%, 43.9%)
Shenandoah County	51171	45.5%	(26.9%, 65.4%)	35.3%	(29.2%, 41.9%)
Spotsylvania County	51177	25.7%	(16.5%, 37.8%)	36.9%	(32.5%, 41.5%)
Stafford County	51179	25.5%	(15.5%, 38.9%)	36.5%	(32.9%, 40.2%)
Warren County	51187	40.2%	(21.1%, 62.8%)	39.1%	(35.3%, 43.0%)
Buena Vista City	51530	0.0%	(0.0%, 84.0%)	34.4%	(28.3%, 41.1%)
Fredericksburg City	51630	47.1%	(21.4%, 74.4%)	42.8%	(36.6%, 49.2%)
Harrisonburg City	51660	46.5%	(16.9%, 78.7%)	48.9%	(33.1%, 65.0%)
Lexington City	51678	100.0%	(0.6%, 100.0%)	33.0%	(18.0%, 52.4%)
Staunton City	51790	43.6%	(5.9%, 90.5%)	50.7%	(43.6%, 57.8%)
Waynesboro	51820	0.0%	(-0.0%, 93.9%)	55.3%	(43.7%, 66.4%)

City					
Winchester City	51840	29.9%	(7.8%, 68.5%)	34.1%	(27.1%, 41.9%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Albemarle County	51003	51.8%	(37.9%, 65.4%)	47.9%	(43.6%, 52.3%)
Alleghany County	51005	24.2%	(10.8%, 45.7%)	37.2%	(29.3%, 45.8%)
Amherst County	51009	26.7%	(11.1%, 51.5%)	34.3%	(30.4%, 38.5%)
Appomattox County	51011	23.7%	(11.3%, 43.0%)	36.2%	(29.9%, 43.1%)
Arlington City	51013	43.7%	(30.5%, 57.9%)	52.3%	(47.4%, 57.1%)
Bedford County	51019	36.9%	(25.6%, 49.9%)	41.1%	(37.5%, 44.9%)
Botetourt County	51023	36.1%	(17.1%, 60.7%)	43.3%	(36.8%, 50.0%)
Campbell County	51031	24.6%	(14.5%, 38.6%)	36.0%	(32.5%, 39.7%)
Craig County	51045	41.7%	(12.8%, 77.8%)	46.6%	(33.1%, 60.6%)
Fairfax County	51059	41.5%	(35.3%, 48.0%)	46.9%	(44.5%, 49.4%)
Fluvanna County	51065	21.8%	(8.8%, 53.8%)	43.0%	(39.0%, 47.0%)
Greene County	51079	38.8%	(11.5%, 75.7%)	34.6%	(29.0%, 40.8%)
Loudoun County	51107	27.4%	(19.3%, 37.3%)	37.9%	(34.8%, 41.2%)
Louisa County	51109	42.2%	(21.2%, 66.5%)	37.6%	(34.2%, 41.2%)
Nelson County	51125	39.8%	(8.7%, 82.1%)	45.0%	(38.0%, 52.2%)
Prince William County	51153	36.9%	(28.5%, 46.1%)	36.0%	(30.4%, 42.0%)
Roanoke County	51161	41.0%	(30.6%, 52.3%)	50.3%	(45.8%, 54.9%)
Alexandria City	51510	33.8%	(20.9%, 49.6%)	40.2%	(35.5%, 45.0%)
Charlottesville City	51540	22.8%	(7.8%, 50.6%)	50.4%	(41.2%, 59.5%)
Covington City	51580	17.2%	(1.7%, 86.0%)	55.0%	(42.1%, 67.3%)
Fairfax City	51600	51.6%	(31.4%, 71.2%)	50.2%	(40.9%, 59.5%)
Falls Church City	51610	45.4%	(12.1%, 83.4%)	60.2%	(46.5%, 72.5%)
Lynchburg City	51680	34.8%	(22.2%, 50.0%)	38.0%	(34.8%, 41.3%)
Manassas City	51683	55.0%	(23.6%, 82.8%)	50.8%	(34.7%, 66.7%)
Manassas Park City	51685	63.7%	(3.5%, 98.7%)	42.5%	(23.8%, 63.6%)
Salem City	51775	43.6%	(14.6%, 77.7%)	38.9%	(35.1%, 42.9%)



County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Bland County	51021	70.9%	(27.8%, 93.9%)	54.3%	(42.5%, 65.7%)
Buchanan County	51027	26.5%	(10.4%, 52.8%)	32.6%	(20.6%, 47.3%)
Carroll County	51035	32.2%	(11.6%, 63.3%)	40.6%	(37.1%, 44.2%)
Dickenson County	51051	17.7%	(6.9%, 49.6%)	36.5%	(28.4%, 45.4%)
Floyd County	51063	40.4%	(14.6%, 73.0%)	45.2%	(39.0%, 51.4%)
Franklin County	51067	33.2%	(19.0%, 51.3%)	42.9%	(39.8%, 46.0%)
Giles County	51071	40.0%	(16.0%, 70.0%)	45.0%	(39.1%, 51.1%)
Grayson County	51077	13.7%	(5.2%, 45.0%)	33.7%	(28.1%, 39.9%)
Henry County	51089	31.2%	(18.9%, 47.0%)	36.9%	(31.0%, 43.3%)
Lee County	51105	20.8%	(9.7%, 39.2%)	29.4%	(23.1%, 36.6%)
Montgomery County	51121	33.4%	(22.3%, 46.6%)	43.3%	(37.0%, 49.9%)
Patrick County	51141	33.6%	(15.4%, 58.6%)	38.3%	(33.4%, 43.5%)
Pittsylvania County	51143	32.6%	(22.1%, 45.2%)	35.3%	(30.1%, 40.8%)
Pulaski County	51155	38.4%	(21.9%, 58.1%)	41.9%	(36.1%, 48.0%)
Russell County	51167	30.9%	(15.6%, 52.0%)	25.9%	(18.5%, 34.8%)
Scott County	51169	12.7%	(6.7%, 23.0%)	26.8%	(20.6%, 34.2%)
Smyth County	51173	34.9%	(17.9%, 56.8%)	37.5%	(33.2%, 42.0%)
Tazewell County	51185	16.4%	(8.8%, 31.7%)	27.7%	(22.1%, 34.1%)
Washington County	51191	31.6%	(19.3%, 47.1%)	35.0%	(30.7%, 39.5%)
Wise County	51195	43.3%	(29.4%, 58.3%)	42.5%	(37.0%, 48.3%)
Wythe County	51197	51.3%	(32.2%, 70.0%)	40.5%	(34.8%, 46.6%)
Bristol City	51520	23.8%	(2.4%, 80.0%)	49.6%	(30.9%, 68.4%)
Danville City	51590	45.3%	(22.2%, 70.8%)	29.3%	(23.0%, 36.6%)
Galax City	51640	0.0%	(-0.0%, 92.2%)	43.8%	(32.2%, 56.2%)
Martinsville City	51690	12.8%	(2.4%, 64.3%)	28.6%	(20.8%, 38.0%)
Norton City	51720	0.0%	(0.0%, 84.1%)	25.2%	(17.2%, 35.3%)
Radford City	51750	26.8%	(9.4%, 56.2%)	42.2%	(34.3%, 50.5%)
Roanoke City	51770	23.0%	(13.4%, 36.7%)	37.6%	(31.6%, 44.0%)



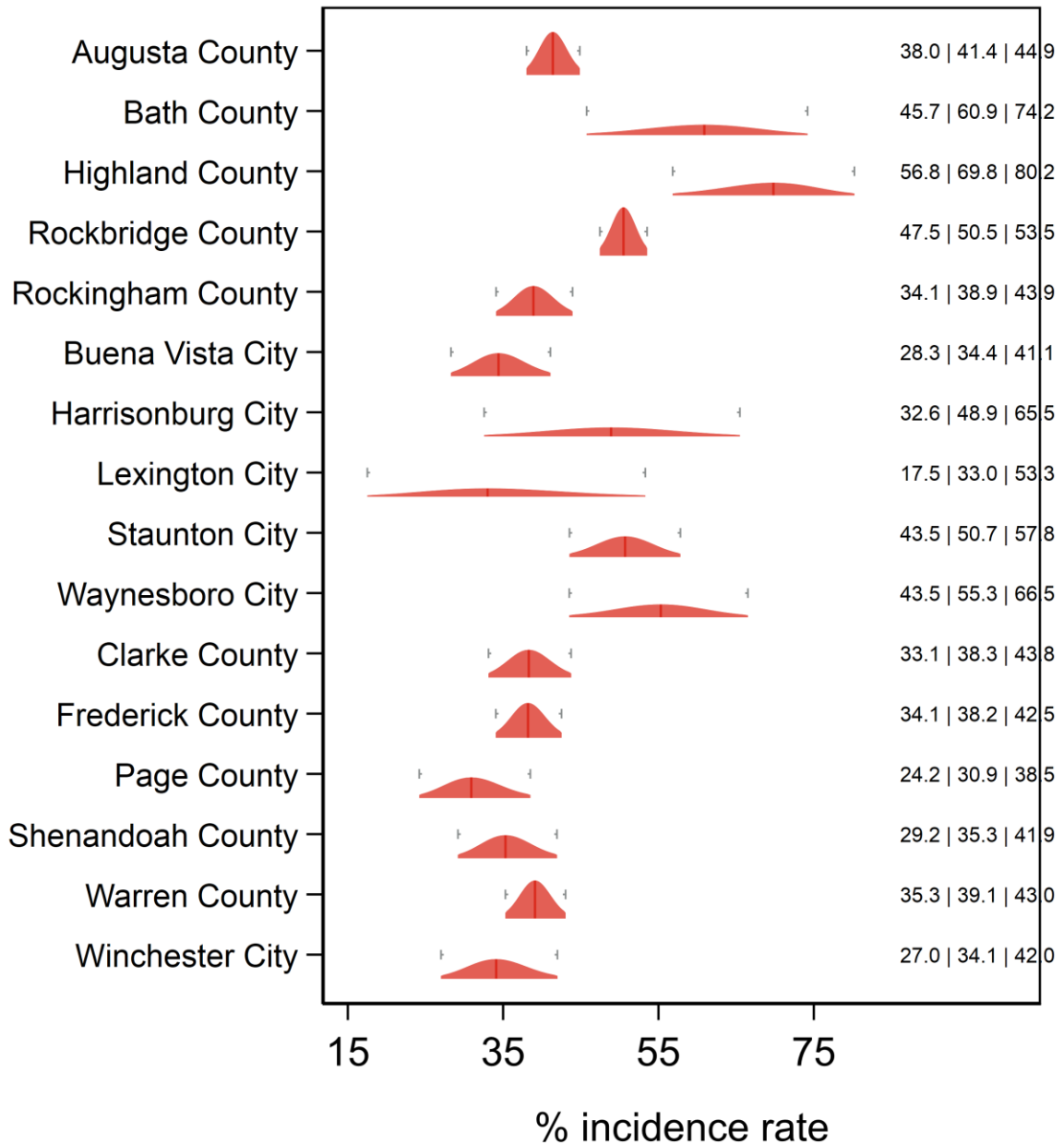
County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Amelia County	51007	25.0%	(8.5%, 54.6%)	31.7%	(26.9%, 36.9%)
Brunswick County	51025	30.6%	(14.8%, 52.8%)	34.9%	(24.2%, 47.3%)
Buckingham County	51029	21.4%	(8.6%, 48.8%)	30.0%	(21.4%, 40.3%)
Charles City County	51036	62.5%	(13.2%, 94.8%)	25.3%	(17.4%, 35.3%)
Charlotte County	51037	22.4%	(8.2%, 48.4%)	26.1%	(19.9%, 33.5%)
Chesterfield County	51041	30.8%	(23.3%, 39.5%)	38.7%	(35.4%, 42.1%)
Cumberland County	51049	20.5%	(5.4%, 53.6%)	30.1%	(26.5%, 33.9%)
Dinwiddie County	51053	16.4%	(7.1%, 33.5%)	30.0%	(25.0%, 35.5%)
Goochland County	51075	50.7%	(24.7%, 76.3%)	44.0%	(40.6%, 47.6%)
Greensville County	51081	4.9%	(2.1%, 43.8%)	22.3%	(13.6%, 34.3%)
Halifax County	51083	40.5%	(25.9%, 57.0%)	33.9%	(30.0%, 38.0%)
Hanover County	51085	50.9%	(36.1%, 65.6%)	44.4%	(41.0%, 47.9%)
Henrico County	51087	28.1%	(20.4%, 37.4%)	38.1%	(34.3%, 42.0%)
Lunenburg County	51111	25.3%	(11.0%, 48.1%)	21.6%	(13.9%, 31.9%)
Mecklenburg County	51117	17.5%	(10.1%, 32.0%)	32.4%	(27.3%, 37.9%)
New Kent County	51127	37.9%	(13.9%, 69.7%)	43.3%	(39.1%, 47.7%)
Nottoway County	51135	31.7%	(11.9%, 61.4%)	25.6%	(18.8%, 33.9%)
Powhatan County	51145	31.1%	(10.5%, 63.3%)	37.1%	(33.5%, 40.8%)
Prince Edward County	51147	37.4%	(14.4%, 67.9%)	37.0%	(33.0%, 41.1%)
Prince George County	51149	29.3%	(11.7%, 56.5%)	33.1%	(28.6%, 38.0%)
Surry County	51181	7.2%	(2.1%, 54.6%)	26.7%	(19.0%, 36.1%)
Sussex County	51183	5.3%	(2.6%, 44.9%)	18.5%	(10.9%, 29.6%)
Colonial Heights City	51570	11.4%	(4.6%, 44.8%)	33.5%	(28.6%, 38.8%)
Emporia City	51595	0.0%	(0.0%, 97.0%)	22.6%	(9.7%, 44.2%)
Hopewell City	51670	31.9%	(12.3%, 61.1%)	32.0%	(26.2%, 38.4%)
Petersburg	51730	29.8%	(13.8%, 53.1%)	35.4%	(27.0%, 44.8%)

City					
Richmond City	51760	32.6%	(21.0%, 46.8%)	37.9%	(32.3%, 44.0%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Accomack County	51001	30.1%	(19.6%, 43.3%)	40.0%	(33.4%, 46.9%)
Essex County	51057	22.8%	(8.4%, 48.7%)	37.0%	(31.0%, 43.4%)
Gloucester County	51073	46.0%	(31.0%, 61.7%)	45.8%	(42.5%, 49.3%)
Isle of Wight County	51093	20.7%	(5.7%, 52.7%)	33.4%	(29.6%, 37.4%)
James City County	51095	48.0%	(34.1%, 62.3%)	45.9%	(41.6%, 50.2%)
King and Queen County	51097	39.3%	(8.0%, 82.9%)	31.5%	(26.1%, 37.4%)
King William County	51101	29.8%	(9.4%, 63.6%)	42.2%	(38.7%, 45.8%)
Lancaster County	51103	71.1%	(44.0%, 88.5%)	58.3%	(47.2%, 68.6%)
Mathews County	51115	52.9%	(30.5%, 74.2%)	61.2%	(49.2%, 71.9%)
Middlesex County	51119	49.0%	(24.7%, 73.9%)	46.4%	(34.6%, 58.7%)
Northampton County	51131	28.2%	(13.5%, 49.7%)	41.2%	(32.6%, 50.3%)
Northumberland County	51133	55.5%	(31.4%, 77.2%)	51.1%	(45.7%, 56.5%)
Richmond County	51159	21.2%	(9.4%, 41.1%)	40.2%	(31.4%, 49.7%)
Southampton County	51175	33.7%	(12.1%, 65.1%)	25.7%	(20.7%, 31.5%)
Westmoreland County	51193	24.5%	(8.7%, 52.5%)	37.7%	(30.5%, 45.5%)
York County	51199	39.0%	(21.4%, 60.1%)	48.1%	(44.5%, 51.8%)
Chesapeake City	51550	32.0%	(24.0%, 41.4%)	35.5%	(32.9%, 38.3%)
Franklin City	51620	7.8%	(1.5%, 74.8%)	30.4%	(23.0%, 38.9%)
Hampton City	51650	29.0%	(20.0%, 39.9%)	36.8%	(32.0%, 41.8%)
Newport News City	51700	49.7%	(36.1%, 63.3%)	35.5%	(32.0%, 39.0%)
Norfolk City	51710	39.9%	(30.2%, 50.6%)	36.0%	(32.6%, 39.6%)
Poquoson City	51735	72.8%	(29.3%, 94.5%)	43.3%	(33.8%, 53.3%)
Portsmouth City	51740	19.9%	(12.2%, 30.8%)	31.2%	(25.8%, 37.2%)
Suffolk City	51800	23.4%	(13.3%, 37.8%)	32.0%	(29.3%, 34.8%)
Virginia Beach City	51810	36.9%	(30.1%, 44.2%)	44.2%	(41.3%, 47.2%)
Williamsburg City	51830	96.8%	(24.2%, 99.3%)	46.5%	(33.7%, 59.7%)



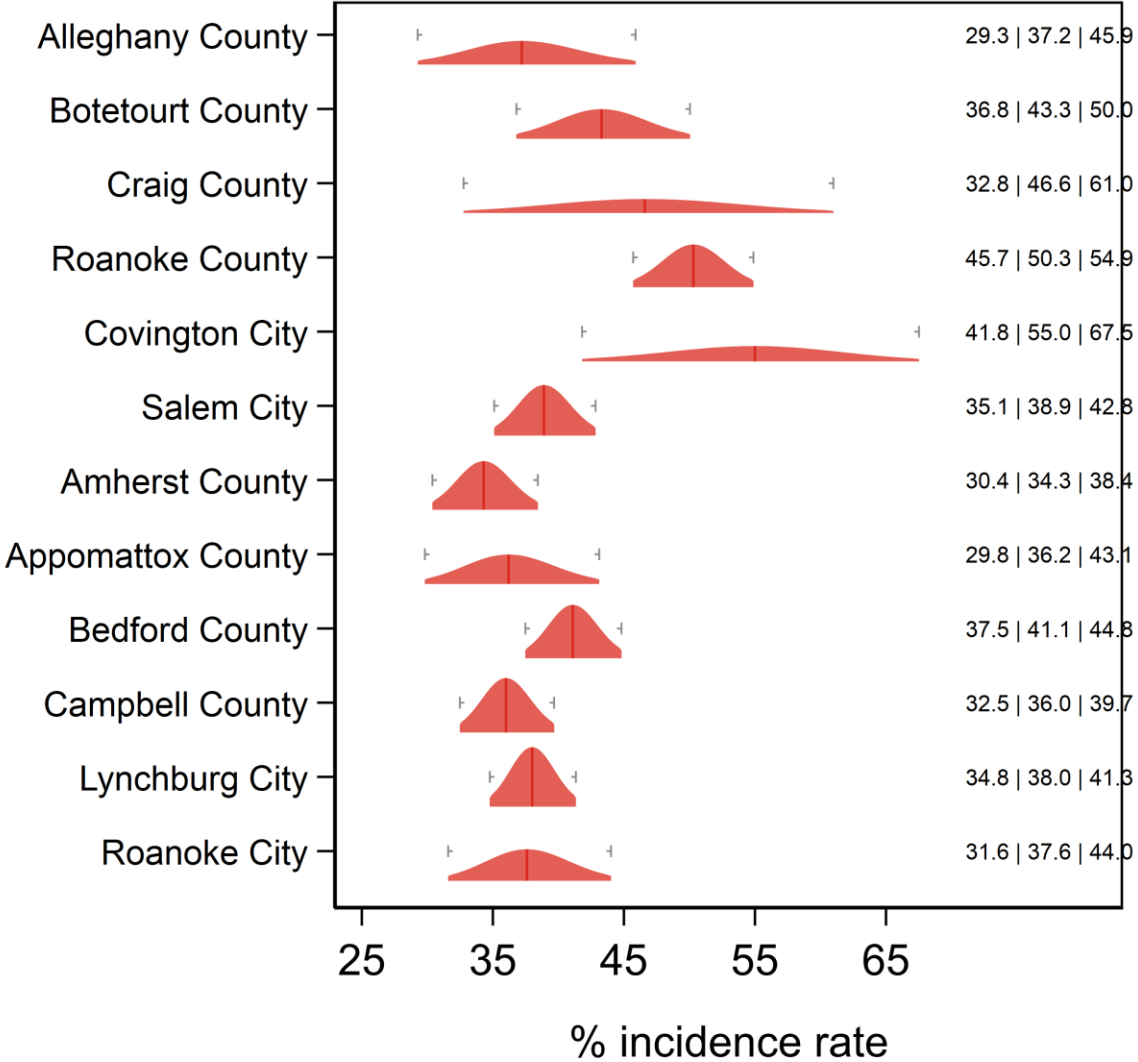
# Shingles (Zoster) Vaccination - Ages 50+ Central Shenandoah and Lord Fairfax HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
Gray markers: 95% confidence interval

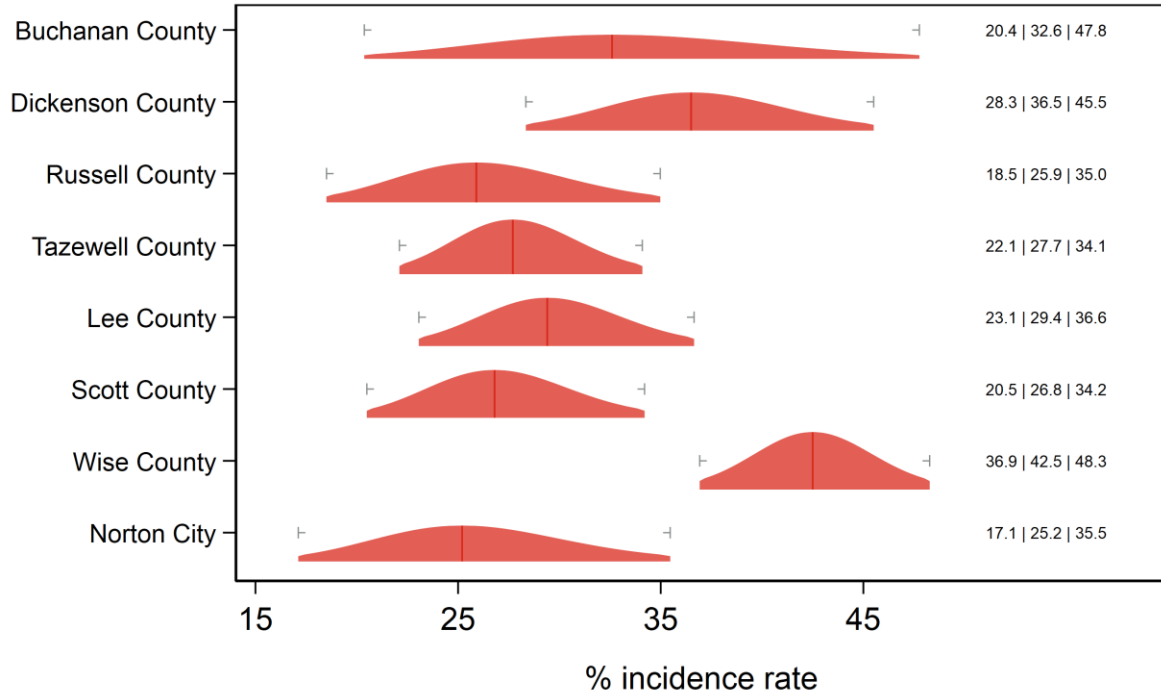


# Shingles (Zoster) Vaccination - Ages 50+ Alleghany, Roanoke and Central Virginia HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

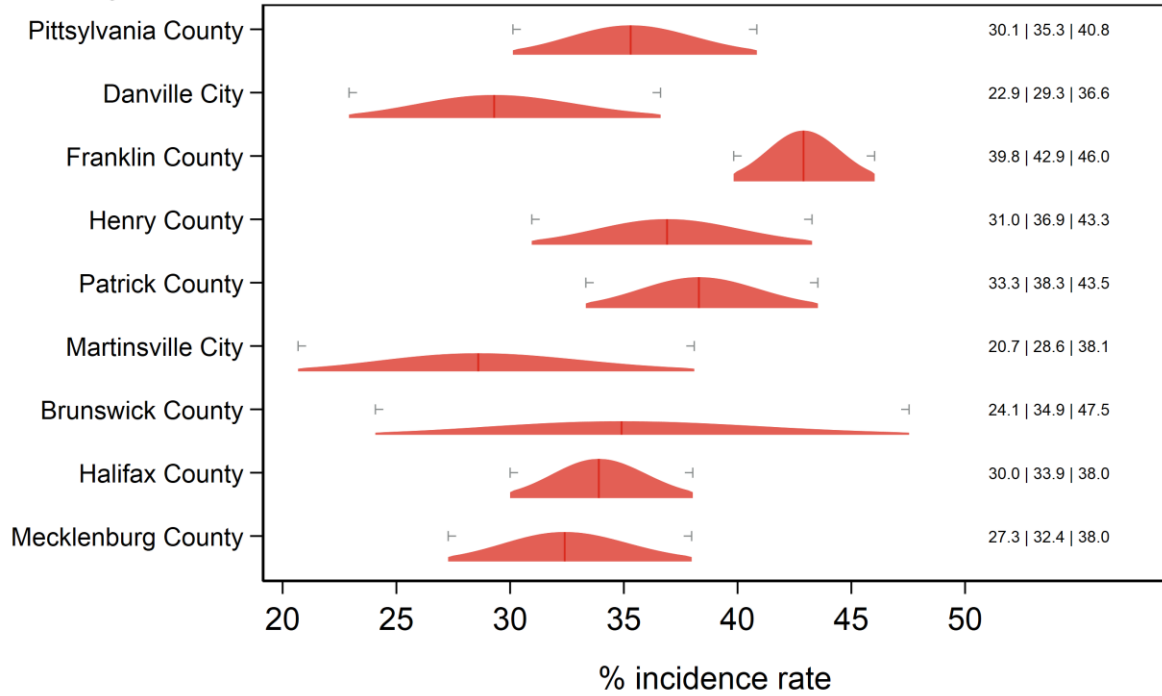
## Shingles (Zoster) Vaccination - Ages 50+ Cumberland Plateau and Lenowisco HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

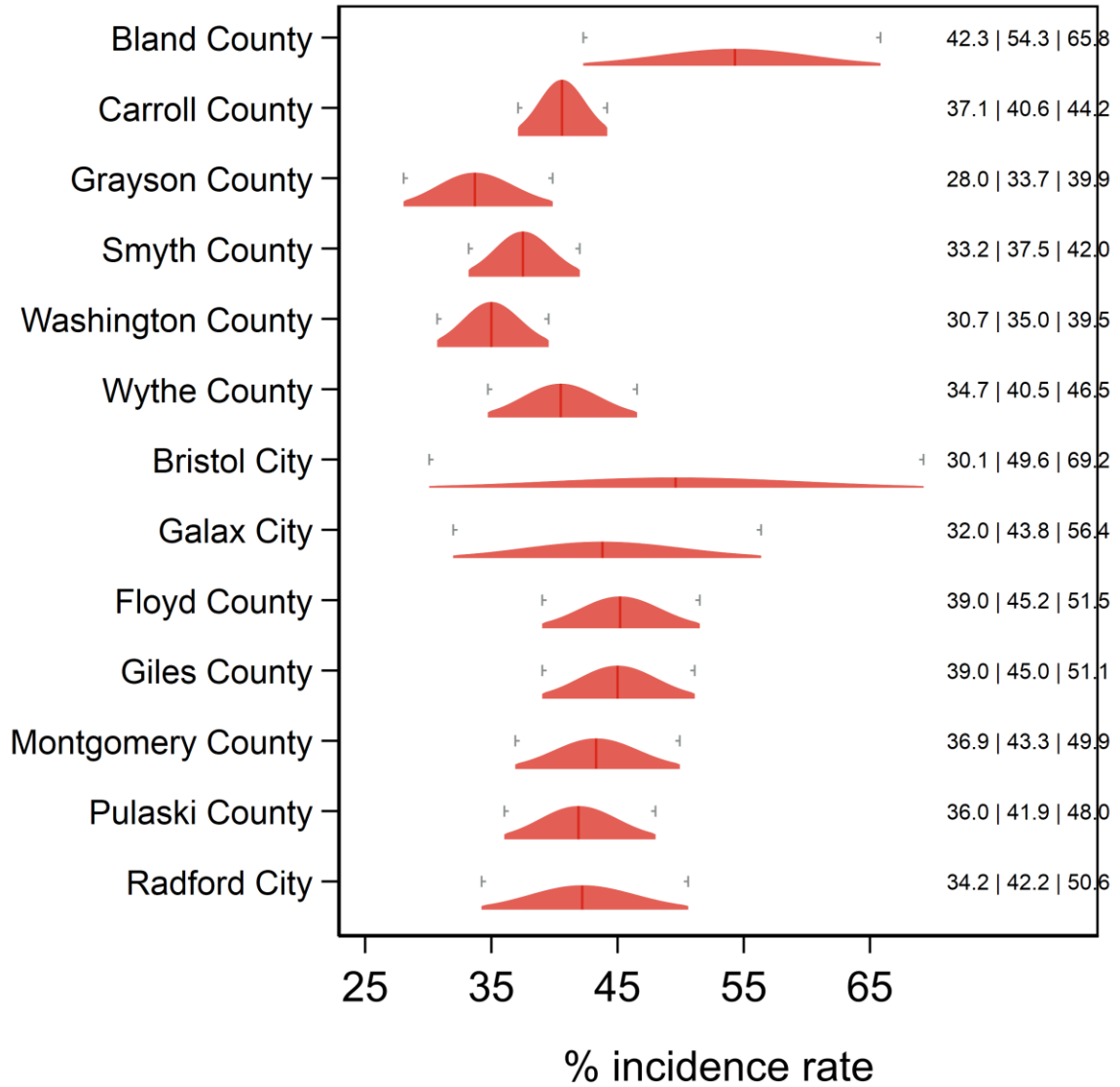


## Shingles (Zoster) Vaccination - Ages 50+ Pittsylvania/Danville, Southside and West Piedmont HDs



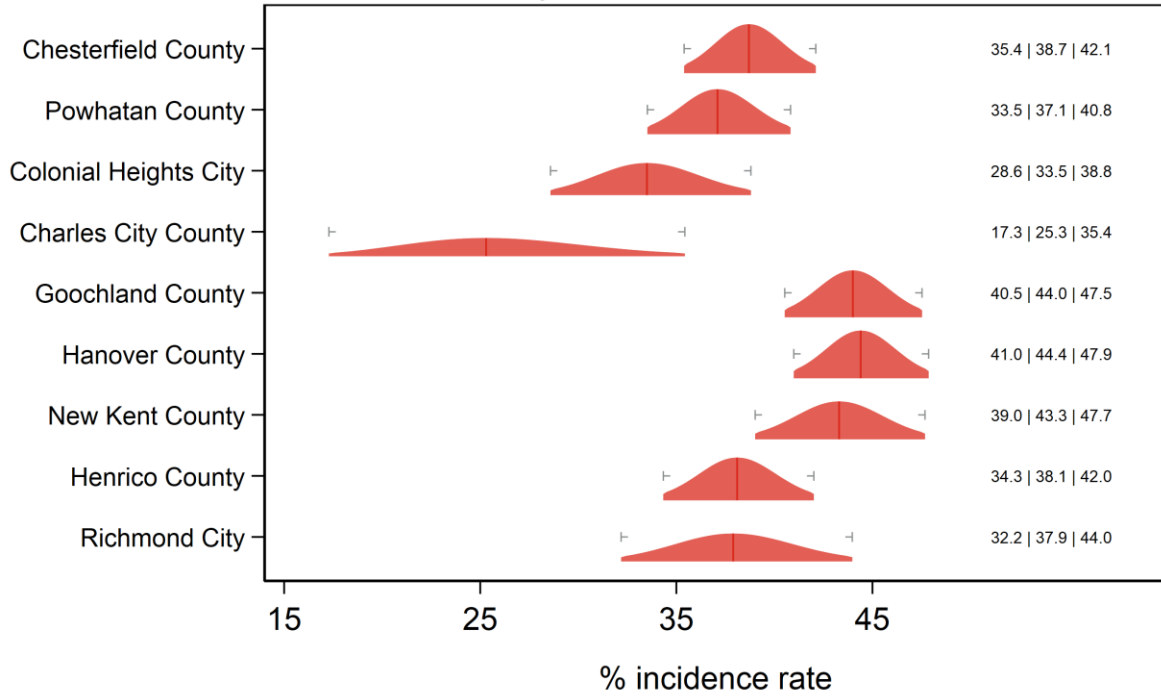
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Shingles (Zoster) Vaccination - Ages 50+ New River and Mount Rogers HDs



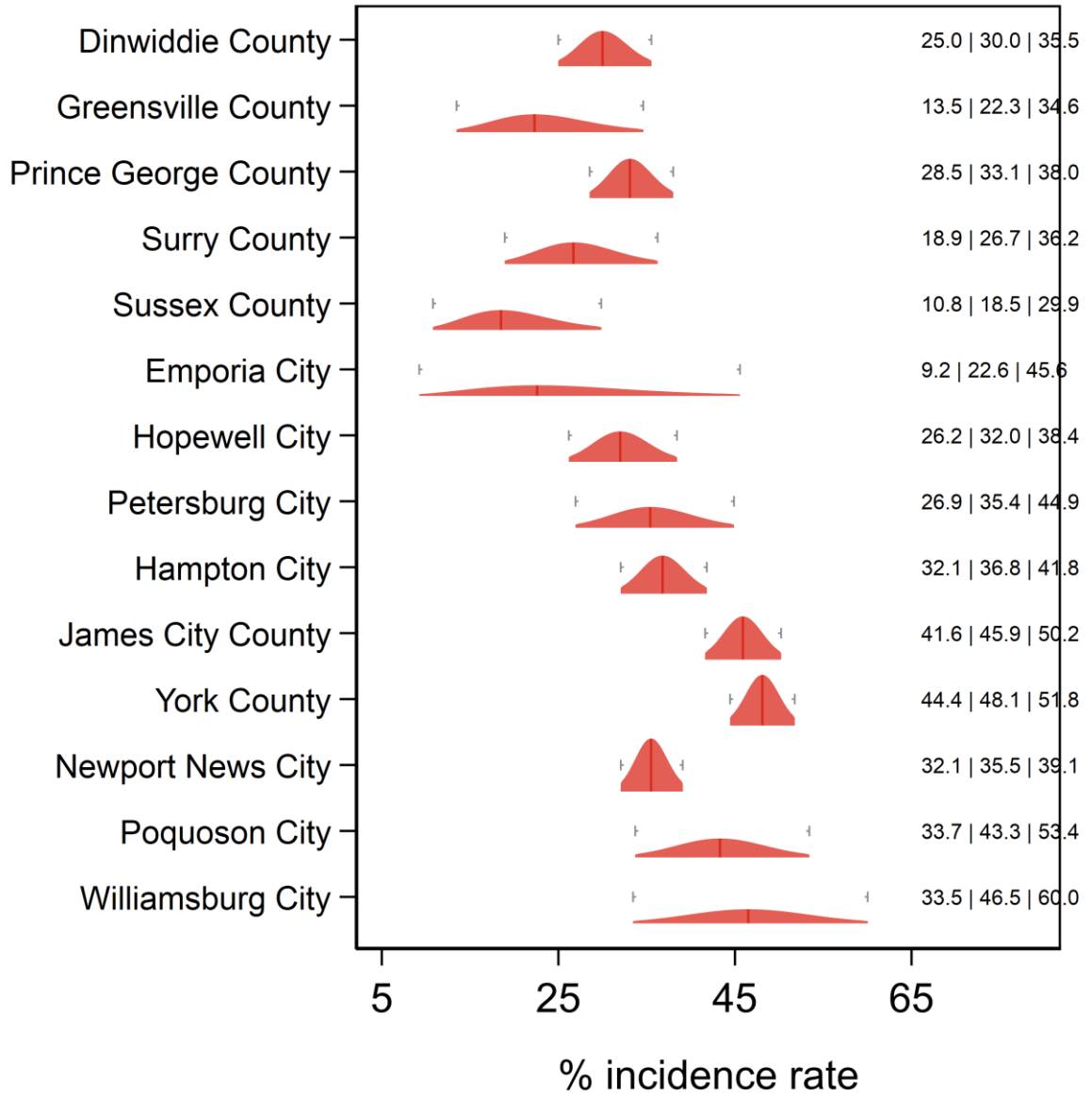
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Shingles (Zoster) Vaccination - Ages 50+ Chesterfield, Chickahominy, Henrico and Richmond HDs



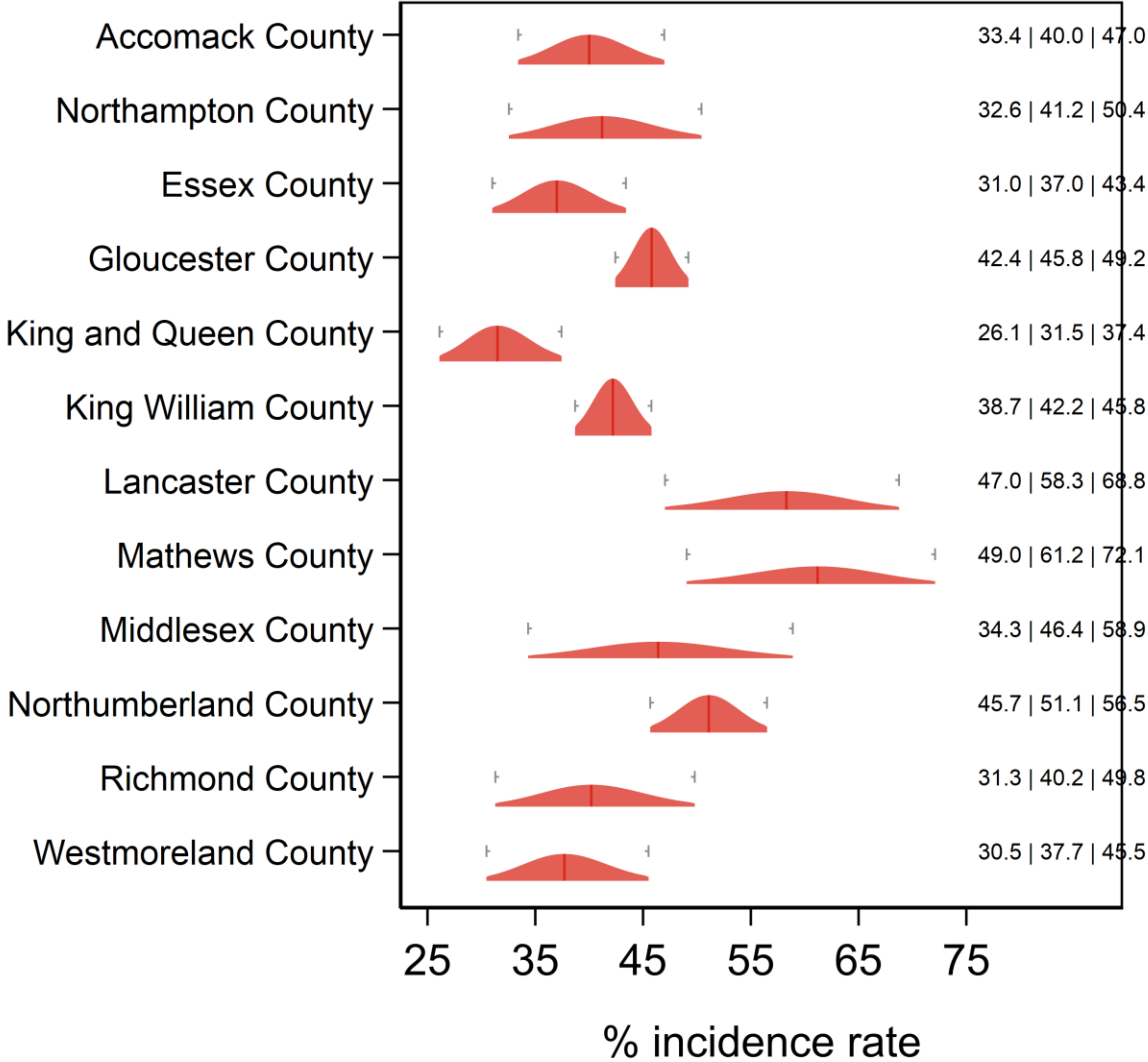
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Shingles (Zoster) Vaccination - Ages 50+ Crater, Peninsula and Hampton HDs



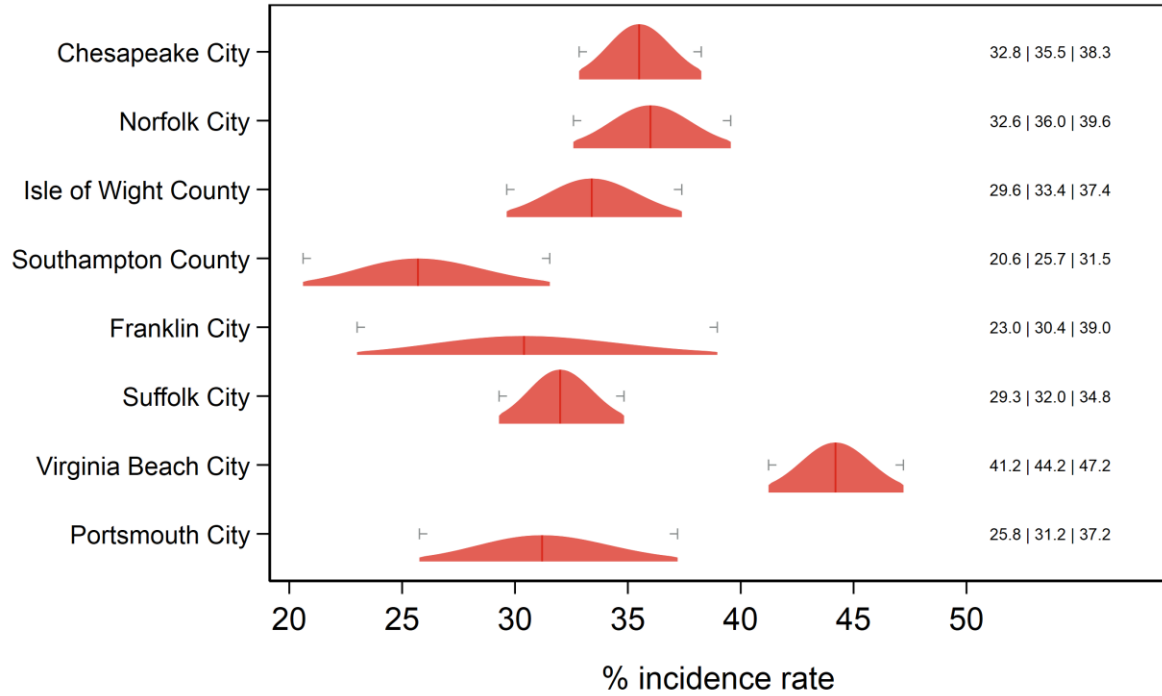
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Shingles (Zoster) Vaccination - Ages 50+ Eastern Shore and Three Rivers HDs



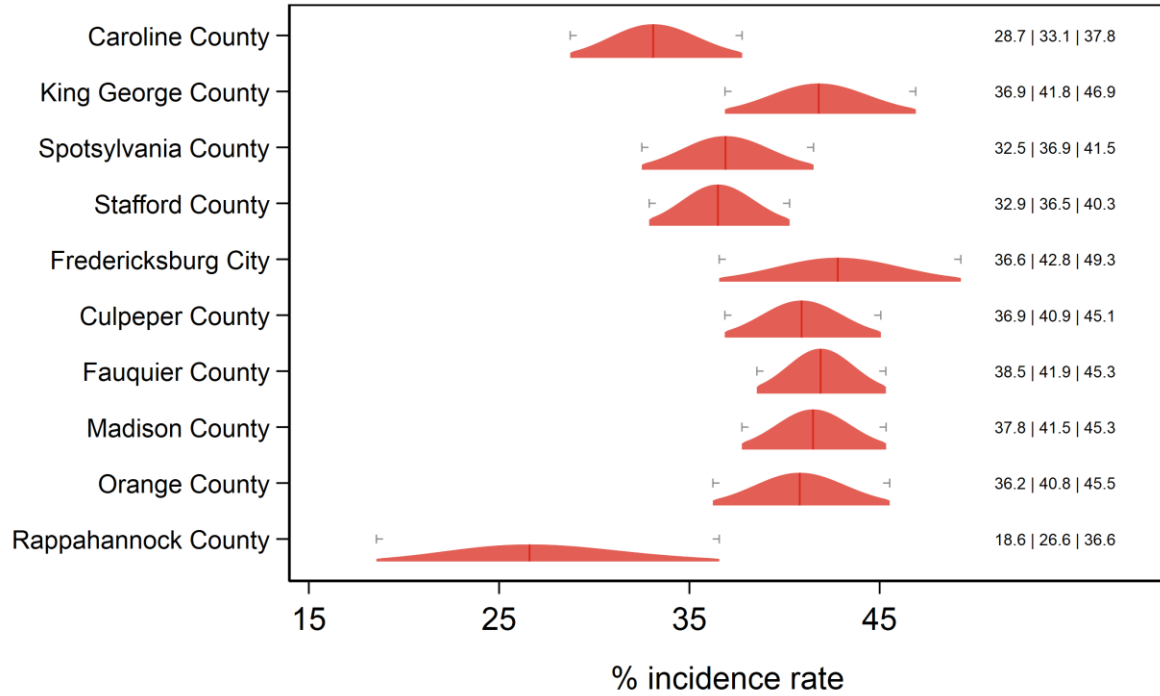
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Shingles (Zoster) Vaccination - Ages 50+ Norfolk, Portsmouth, Chesapeake, VA Beach, W. Tidewater HDs



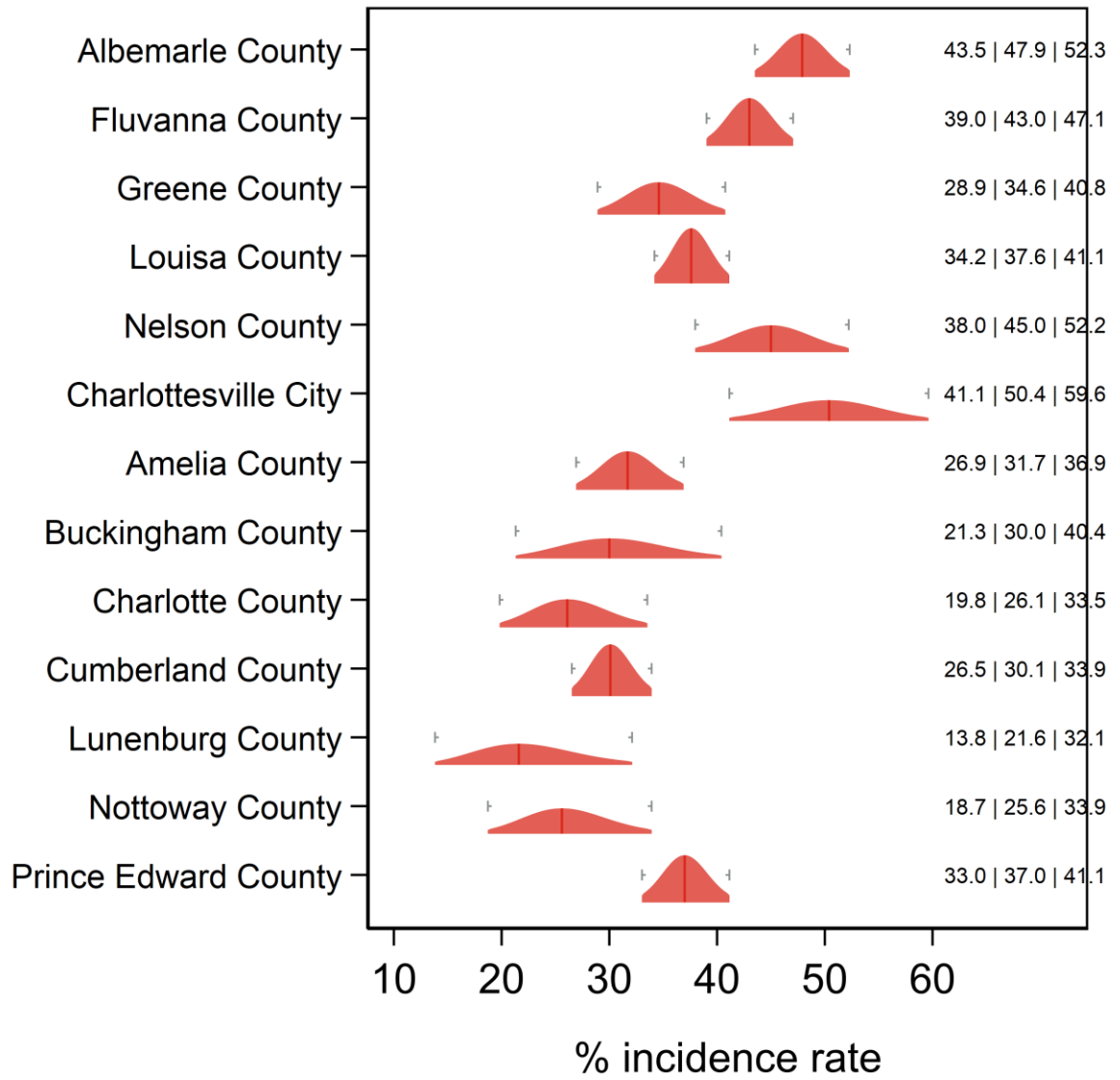
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Shingles (Zoster) Vaccination - Ages 50+ Rappahannock/Rapidan and Rappahannock HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

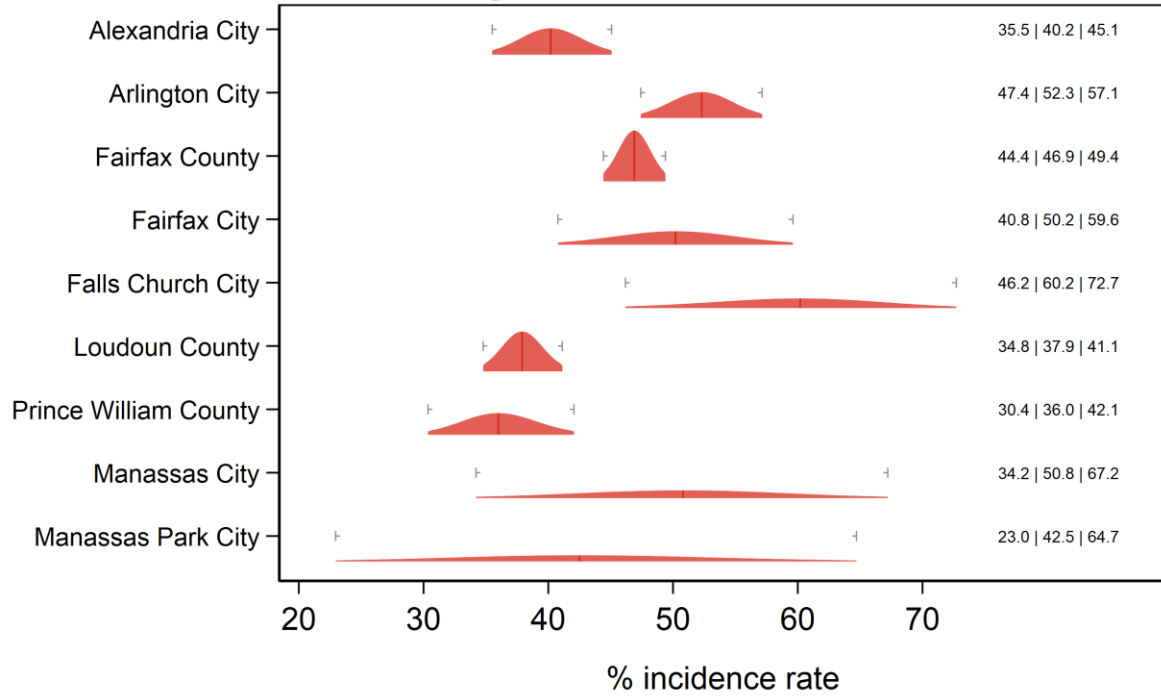
# Shingles (Zoster) Vaccination - Ages 50+ Thomas Jefferson and Piedmont HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval



## Shingles (Zoster) Vaccination - Ages 50+ Alexandria, Fairfax, Arlington, Loudon, Prince William HDs



Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval



## Additional diagnostics

Direct estimate is inside the 95% SAE Wilson CI: 42 areas.

Direct estimate is outside the 95% SAE Wilson CI: 91 areas.

SAE estimate is inside the 95% direct Wilson CI: 125 areas.

SAE estimate is outside the 95% direct Wilson CI: 8 areas.

SAE Wilson 95% CI is fully inside the 95% direct Wilson CI: 104 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 29 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: 3 areas.

Direct standard error is zero: 6 areas.

Proportion of SAE variance due to ACS sampling error: min = 0.19%; med = 4.23%; max = 28.30%.

Proportion of SAE variance due to sampling error in regression coefficient estimates: min = 60.10%; med = 91.04%; max = 98.96%.

Proportion of SAE variance due to model selection: min = 0.05%; med = 2.73%; max = 30.96%.

Proportion of SAE variance due to area random effects: <identically zero>