

## Outcome 34: Pneumonia Vaccination - All Ages

Internal variable name: outc34\_pneum\_vacc

Definition: A pneumonia shot or pneumococcal vaccine is usually given only once or twice in a person's lifetime and is different from the flu shot. Have you ever had a pneumonia shot?

### Predictive models

	Mixed, demos only	Logit, no area effects	Mixed with area covariates
	b/se	b/se	b/se
Outcome 34: Pneumonia Vaccination - All Ages			
NH White	0.0000 (.)	0.0000 (.)	0.0000 (.)
NH Black vs. NH White	-0.3320** (0.1020)	-0.2730* (0.1090)	-0.2730** (0.1022)
NH Asian vs. NH White	-0.2547 (0.1718)	-0.2237 (0.2609)	-0.2237 (0.1746)
NH Other vs. NH White	-0.0222 (0.1846)	0.0140 (0.1716)	0.0140 (0.1792)
Hispanic vs. NH White	-0.2123 (0.1483)	-0.1722 (0.1632)	-0.1722 (0.1483)
SEX OF RESPONDENT=1	0.0000 (.)	0.0000 (.)	0.0000 (.)
Female	0.2425** (0.0815)	0.2514*** (0.0758)	0.2514** (0.0805)
Age 18-34 vs. 65+	-2.3826*** (0.1477)	-2.3730*** (0.1091)	- 2.3730*** (0.1431)
Age 35-44 vs. 65+	-2.8108*** (0.2093)	-2.8152*** (0.1362)	- 2.8152*** (0.2063)
Age 45-54 vs. 65+	-2.6146*** (0.1146)	-2.6316*** (0.1124)	- 2.6316*** (0.1145)
Age 55-64 vs. 65+	-1.8311*** (0.0911)	-1.8345*** (0.0924)	- 1.8345*** (0.0895)
65+	0.0000 (.)	0.0000 (.)	0.0000 (.)
Percentage calculated by dividing Pop_65plus_ACS_15_19 by		0.0773	0.0773

Tot_Population_ACS_15_			
		(2.5923)	(1.8939)
Percentage calculated by dividing Rel_Child_Under_6_CEN_2010 by Rel_Family_HHDS_		0.5926	0.5926
		(2.0321)	(1.8239)
VA BRFSS 2014 SAE outc11_skin_cancer		7.8430**	7.8430***
		(2.7373)	(2.2515)
Percentage calculated by dividing Pop_65plus_ACS_15_19 by Tot_Population_ACS_15_		0.0000	
		(.)	
Log(Kidney Female Rate + 1)		-0.0085	-0.0085
		(0.1919)	(0.1516)
Percentage calculated by dividing Pop_65plus_ACS_15_19 by Tot_Population_ACS_15_ # Log(Kidney Female Rate + 1)		-0.5009	-0.5009
		(0.9171)	(0.7000)
_cons	1.0134***	0.6160	0.6160
	(0.0869)	(0.8760)	(0.7210)
Area effect variance			
var(_cons[FIPS_county])	0.0036		0.0000
	(0.0203)		(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	37.5%	(27.5%, 48.7%)	47.7%	(45.2%, 50.1%)
Bath County	51017	51.1%	(19.4%, 81.9%)	53.5%	(48.5%, 58.3%)
Caroline County	51033	40.0%	(19.5%, 64.8%)	41.4%	(37.6%, 45.2%)
Clarke County	51043	58.9%	(32.2%, 81.3%)	51.6%	(47.1%, 56.0%)
Culpeper County	51047	29.7%	(15.5%, 49.2%)	43.9%	(40.0%, 47.9%)
Fauquier County	51061	34.3%	(21.9%, 49.4%)	47.7%	(44.8%, 50.6%)
Frederick County	51069	36.4%	(24.5%, 50.4%)	44.4%	(41.6%, 47.3%)
Highland County	51091	52.9%	(15.9%, 87.0%)	45.9%	(34.5%, 57.8%)
King George County	51099	37.5%	(18.2%, 61.8%)	42.5%	(40.3%, 44.8%)
Madison County	51113	20.6%	(9.6%, 46.0%)	45.2%	(42.0%, 48.4%)
Orange County	51137	38.9%	(21.6%, 59.5%)	43.8%	(40.9%, 46.8%)
Page County	51139	63.0%	(39.2%, 81.8%)	50.3%	(46.4%, 54.2%)
Rappahannock County	51157	51.5%	(16.7%, 84.9%)	47.7%	(43.6%, 51.9%)
Rockbridge County	51163	40.6%	(23.1%, 60.8%)	50.3%	(46.1%, 54.5%)
Rockingham County	51165	24.1%	(15.6%, 35.3%)	38.2%	(36.0%, 40.4%)
Shenandoah County	51171	27.6%	(16.7%, 41.9%)	44.7%	(41.9%, 47.6%)
Spotsylvania County	51177	33.3%	(23.8%, 44.4%)	39.9%	(37.7%, 42.2%)
Stafford County	51179	25.5%	(17.7%, 35.3%)	37.1%	(34.1%, 40.3%)
Warren County	51187	24.5%	(13.1%, 41.0%)	47.0%	(44.5%, 49.5%)
Buena Vista City	51530	26.7%	(2.9%, 81.5%)	46.4%	(42.9%, 49.8%)
Fredericksburg City	51630	31.2%	(14.6%, 54.6%)	32.9%	(28.2%, 37.9%)
Harrisonburg City	51660	24.7%	(8.6%, 53.3%)	37.0%	(34.4%, 39.8%)
Lexington City	51678	100.0%	(0.6%, 100.0%)	41.0%	(33.7%, 48.7%)
Staunton City	51790	29.0%	(8.1%, 65.4%)	46.5%	(42.6%, 50.4%)
Waynesboro	51820	79.0%	(16.9%, 97.0%)	43.7%	(39.5%, 48.1%)

City					
Winchester City	51840	10.9%	(4.5%, 46.3%)	44.1%	(40.8%, 47.4%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Albemarle County	51003	52.2%	(39.0%, 65.2%)	43.3%	(41.2%, 45.4%)
Alleghany County	51005	41.9%	(23.4%, 63.0%)	42.2%	(38.1%, 46.6%)
Amherst County	51009	31.3%	(17.5%, 49.6%)	47.6%	(44.7%, 50.5%)
Appomattox County	51011	46.1%	(28.9%, 64.3%)	51.0%	(47.1%, 54.9%)
Arlington City	51013	29.6%	(20.8%, 40.2%)	33.8%	(31.7%, 36.1%)
Bedford County	51019	40.5%	(30.2%, 51.8%)	45.8%	(42.7%, 48.9%)
Botetourt County	51023	56.4%	(35.3%, 75.5%)	51.7%	(48.1%, 55.3%)
Campbell County	51031	30.4%	(20.5%, 42.5%)	36.2%	(33.4%, 39.1%)
Craig County	51045	22.9%	(5.4%, 60.6%)	52.2%	(47.1%, 57.1%)
Fairfax County	51059	33.5%	(28.9%, 38.4%)	38.4%	(36.9%, 39.9%)
Fluvanna County	51065	10.1%	(5.0%, 36.1%)	45.5%	(43.0%, 48.1%)
Greene County	51079	61.4%	(27.0%, 87.2%)	40.8%	(36.3%, 45.5%)
Loudoun County	51107	26.2%	(20.2%, 33.3%)	37.6%	(34.0%, 41.5%)
Louisa County	51109	41.6%	(22.3%, 63.8%)	44.9%	(42.0%, 47.7%)
Nelson County	51125	23.7%	(7.4%, 67.1%)	44.5%	(39.7%, 49.4%)
Prince William County	51153	30.3%	(24.4%, 37.0%)	34.0%	(31.9%, 36.3%)
Roanoke County	51161	42.7%	(33.0%, 52.9%)	51.7%	(48.8%, 54.6%)
Alexandria City	51510	26.1%	(17.9%, 36.4%)	33.9%	(31.1%, 36.7%)
Charlottesville City	51540	19.5%	(8.6%, 38.4%)	33.1%	(29.5%, 36.9%)
Covington City	51580	0.0%	(-0.0%, 81.2%)	35.3%	(29.4%, 41.7%)
Fairfax City	51600	31.5%	(18.1%, 49.0%)	37.6%	(35.1%, 40.1%)
Falls Church City	51610	40.4%	(14.6%, 72.8%)	44.0%	(41.3%, 46.7%)
Lynchburg City	51680	37.6%	(25.4%, 51.7%)	39.6%	(37.3%, 41.9%)
Manassas City	51683	46.0%	(22.6%, 71.4%)	30.9%	(27.1%, 35.0%)
Manassas Park City	51685	20.9%	(4.2%, 75.3%)	32.9%	(25.5%, 41.3%)
Salem City	51775	15.0%	(4.8%, 64.7%)	36.7%	(33.5%, 39.9%)



County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Bland County	51021	31.1%	(7.6%, 71.2%)	50.9%	(47.2%, 54.7%)
Buchanan County	51027	27.9%	(12.7%, 50.8%)	49.9%	(45.9%, 53.9%)
Carroll County	51035	32.6%	(13.6%, 59.7%)	48.9%	(46.0%, 51.8%)
Dickenson County	51051	47.0%	(23.8%, 71.6%)	45.6%	(42.6%, 48.6%)
Floyd County	51063	21.7%	(9.0%, 43.8%)	36.8%	(33.9%, 39.9%)
Franklin County	51067	35.5%	(22.1%, 51.8%)	49.1%	(46.4%, 51.8%)
Giles County	51071	29.8%	(10.8%, 59.8%)	36.8%	(34.0%, 39.7%)
Grayson County	51077	16.0%	(5.3%, 39.1%)	43.3%	(39.3%, 47.5%)
Henry County	51089	43.4%	(30.6%, 57.2%)	46.3%	(43.5%, 49.2%)
Lee County	51105	56.7%	(33.7%, 77.2%)	44.7%	(42.0%, 47.5%)
Montgomery County	51121	34.5%	(24.7%, 45.9%)	39.9%	(37.0%, 42.9%)
Patrick County	51141	46.9%	(26.2%, 68.7%)	47.5%	(43.1%, 52.0%)
Pittsylvania County	51143	42.8%	(31.3%, 55.2%)	46.2%	(43.8%, 48.6%)
Pulaski County	51155	49.1%	(30.9%, 67.5%)	36.8%	(33.8%, 39.9%)
Russell County	51167	37.8%	(19.5%, 60.2%)	45.8%	(43.2%, 48.5%)
Scott County	51169	42.2%	(28.2%, 57.5%)	50.0%	(46.3%, 53.8%)
Smyth County	51173	44.2%	(27.5%, 62.3%)	53.5%	(49.7%, 57.3%)
Tazewell County	51185	39.0%	(26.0%, 53.7%)	46.7%	(44.1%, 49.4%)
Washington County	51191	33.1%	(22.3%, 46.0%)	49.5%	(46.8%, 52.2%)
Wise County	51195	45.6%	(32.5%, 59.4%)	50.3%	(47.1%, 53.4%)
Wythe County	51197	51.6%	(33.3%, 69.5%)	52.5%	(48.4%, 56.6%)
Bristol City	51520	33.0%	(5.1%, 82.1%)	52.7%	(48.5%, 57.0%)
Danville City	51590	39.5%	(18.8%, 64.9%)	46.9%	(43.5%, 50.3%)
Galax City	51640	100.0%	(7.8%, 100.0%)	52.8%	(48.4%, 57.3%)
Martinsville City	51690	80.5%	(39.9%, 96.3%)	47.9%	(43.7%, 52.2%)
Norton City	51720	21.8%	(0.9%, 95.7%)	57.7%	(51.7%, 63.6%)
Radford City	51750	31.4%	(12.5%, 59.5%)	39.4%	(31.3%, 48.0%)
Roanoke City	51770	26.9%	(18.4%, 37.7%)	37.8%	(34.5%, 41.2%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Amelia County	51007	36.1%	(14.6%, 65.0%)	42.1%	(39.4%, 45.0%)
Brunswick County	51025	55.9%	(30.8%, 78.3%)	45.1%	(42.4%, 47.9%)
Buckingham County	51029	15.8%	(8.1%, 42.2%)	49.7%	(45.8%, 53.5%)
Charles City County	51036	11.1%	(1.7%, 81.6%)	42.2%	(38.6%, 46.0%)
Charlotte County	51037	33.0%	(16.2%, 55.6%)	48.4%	(44.8%, 52.1%)
Chesterfield County	51041	28.5%	(22.3%, 35.5%)	40.2%	(38.1%, 42.3%)
Cumberland County	51049	10.5%	(4.6%, 48.8%)	42.5%	(39.3%, 45.8%)
Dinwiddie County	51053	32.6%	(17.7%, 52.0%)	38.5%	(35.7%, 41.3%)
Goochland County	51075	24.4%	(9.7%, 49.3%)	46.6%	(43.6%, 49.5%)
Greensville County	51081	48.0%	(21.3%, 75.8%)	37.1%	(33.3%, 41.1%)
Halifax County	51083	38.5%	(24.6%, 54.4%)	47.7%	(43.8%, 51.6%)
Hanover County	51085	43.7%	(30.1%, 58.3%)	47.1%	(44.1%, 50.1%)
Henrico County	51087	39.6%	(31.1%, 48.7%)	39.8%	(38.0%, 41.6%)
Lunenburg County	51111	31.4%	(13.9%, 56.5%)	46.5%	(42.6%, 50.5%)
Mecklenburg County	51117	49.0%	(33.1%, 65.1%)	45.5%	(42.2%, 48.9%)
New Kent County	51127	29.8%	(13.1%, 54.5%)	41.7%	(38.0%, 45.4%)
Nottoway County	51135	23.3%	(11.0%, 46.3%)	44.5%	(41.8%, 47.3%)
Powhatan County	51145	23.8%	(9.1%, 49.4%)	48.3%	(45.7%, 50.9%)
Prince Edward County	51147	56.1%	(33.3%, 76.7%)	45.7%	(42.4%, 49.0%)
Prince George County	51149	34.5%	(18.3%, 55.3%)	42.5%	(36.7%, 48.5%)
Surry County	51181	76.5%	(28.6%, 96.4%)	42.1%	(38.2%, 46.1%)
Sussex County	51183	31.9%	(12.6%, 60.3%)	36.4%	(33.1%, 39.9%)
Colonial Heights City	51570	30.0%	(13.2%, 54.7%)	35.8%	(32.4%, 39.4%)
Emporia City	51595	60.2%	(6.8%, 96.9%)	42.0%	(37.1%, 47.1%)
Hopewell City	51670	25.3%	(10.7%, 49.0%)	36.9%	(33.8%, 40.1%)
Petersburg	51730	26.9%	(13.4%, 46.7%)	36.4%	(33.1%, 39.9%)

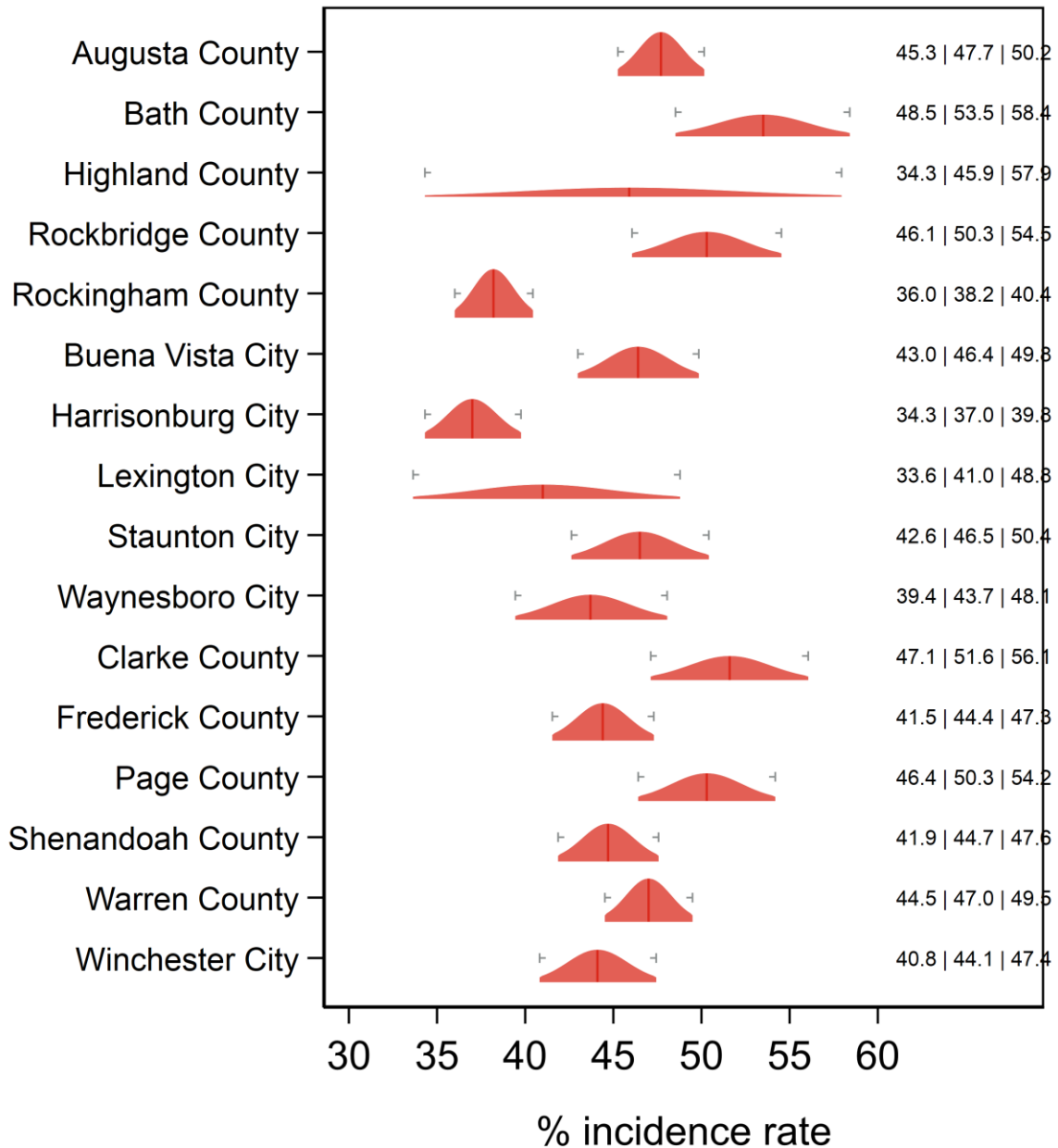


City					
Richmond City	51760	22.1%	(15.3%, 30.7%)	32.6%	(30.2%, 35.1%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Accomack County	51001	26.7%	(17.2%, 38.8%)	49.1%	(46.0%, 52.1%)
Essex County	51057	29.8%	(13.7%, 53.2%)	56.8%	(52.1%, 61.3%)
Gloucester County	51073	36.7%	(22.7%, 53.4%)	50.8%	(48.1%, 53.5%)
Isle of Wight County	51093	28.3%	(13.9%, 49.1%)	39.7%	(36.9%, 42.4%)
James City County	51095	53.7%	(40.9%, 65.9%)	48.3%	(44.7%, 51.9%)
King and Queen County	51097	70.7%	(34.2%, 91.8%)	52.3%	(48.5%, 56.0%)
King William County	51101	13.8%	(6.6%, 47.1%)	44.9%	(43.0%, 46.9%)
Lancaster County	51103	41.0%	(19.1%, 67.0%)	44.1%	(34.8%, 53.8%)
Mathews County	51115	59.0%	(37.3%, 77.7%)	53.6%	(47.5%, 59.6%)
Middlesex County	51119	44.1%	(20.0%, 71.4%)	43.1%	(35.7%, 50.8%)
Northampton County	51131	40.8%	(21.0%, 64.1%)	49.1%	(45.0%, 53.2%)
Northumberland County	51133	48.5%	(25.7%, 71.8%)	50.4%	(41.1%, 59.6%)
Richmond County	51159	28.0%	(16.6%, 43.3%)	44.6%	(41.2%, 48.1%)
Southampton County	51175	43.3%	(20.2%, 69.7%)	43.9%	(40.1%, 47.9%)
Westmoreland County	51193	55.9%	(34.3%, 75.5%)	55.2%	(50.7%, 59.6%)
York County	51199	36.8%	(23.1%, 53.0%)	48.8%	(45.7%, 51.9%)
Chesapeake City	51550	25.7%	(19.5%, 33.0%)	38.7%	(36.6%, 40.9%)
Franklin City	51620	13.0%	(3.3%, 68.8%)	33.7%	(29.2%, 38.4%)
Hampton City	51650	28.6%	(21.1%, 37.6%)	36.0%	(33.6%, 38.5%)
Newport News City	51700	26.6%	(19.2%, 35.5%)	34.0%	(31.8%, 36.3%)
Norfolk City	51710	28.0%	(21.3%, 35.8%)	31.7%	(29.5%, 34.0%)
Poquoson City	51735	54.7%	(19.2%, 86.0%)	46.8%	(43.1%, 50.5%)
Portsmouth City	51740	29.6%	(20.9%, 40.1%)	34.9%	(32.3%, 37.7%)
Suffolk City	51800	36.8%	(24.9%, 50.5%)	40.6%	(38.7%, 42.6%)
Virginia Beach City	51810	35.5%	(29.4%, 42.2%)	37.6%	(35.7%, 39.5%)
Williamsburg City	51830	52.9%	(15.7%, 87.1%)	39.4%	(32.0%, 47.3%)



## Pneumonia Vaccination - All Ages Central Shenandoah and Lord Fairfax HDs

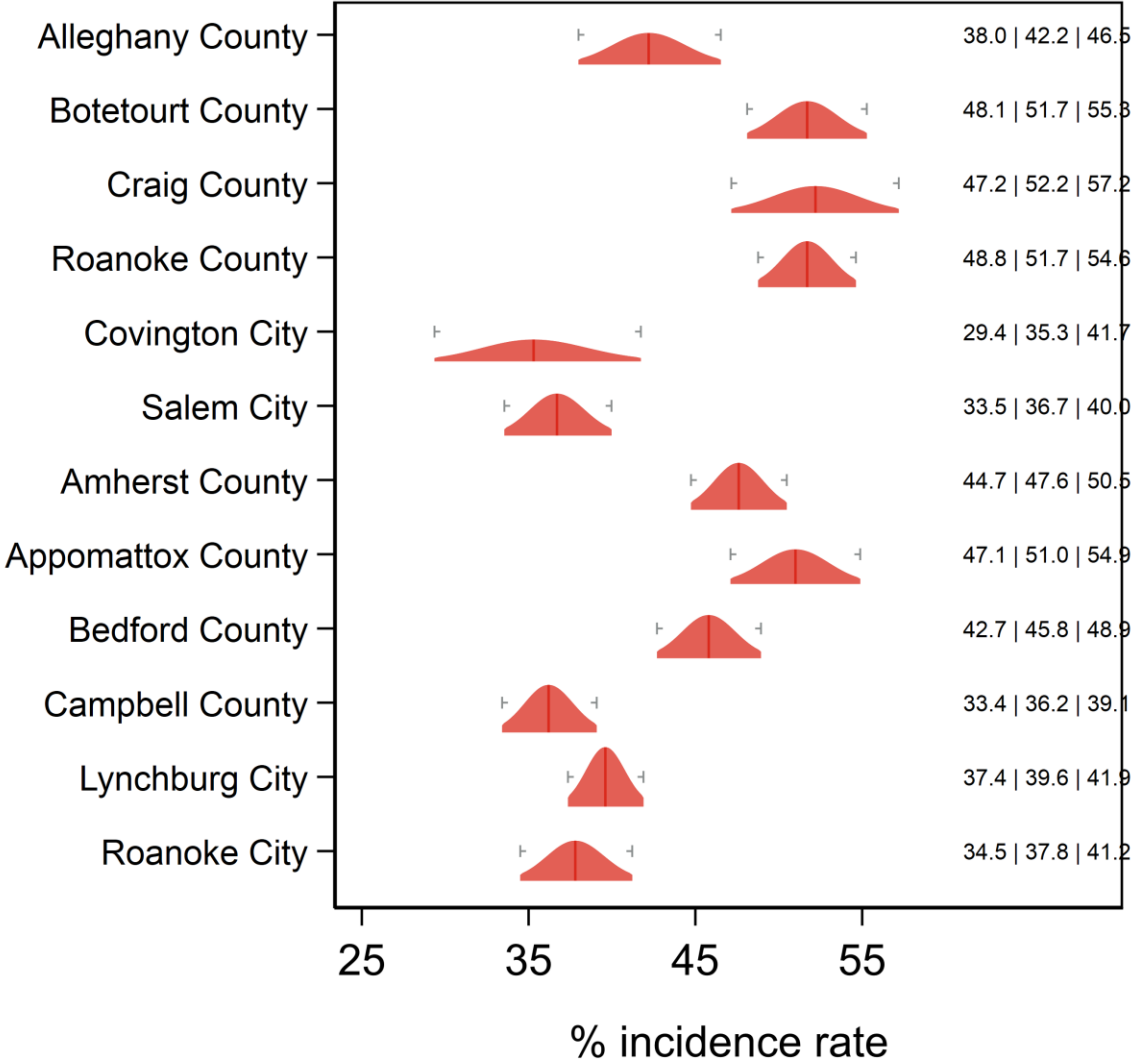


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval



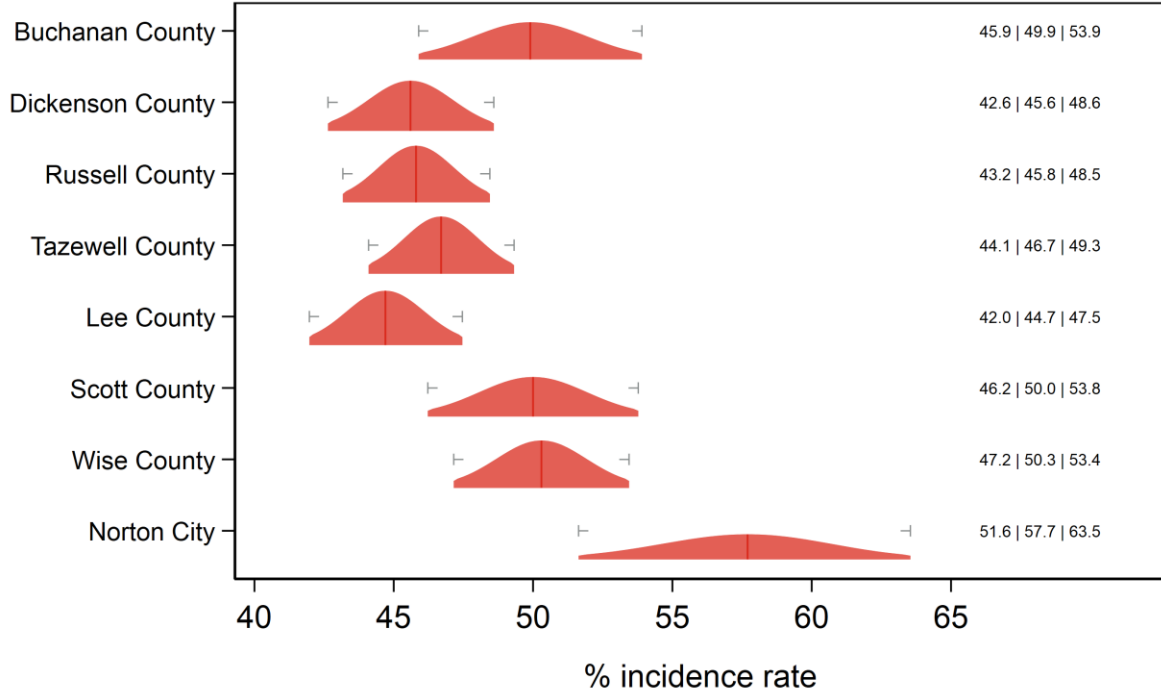
# Pneumonia Vaccination - All Ages

## Alleghany, Roanoke and Central Virginia HDs



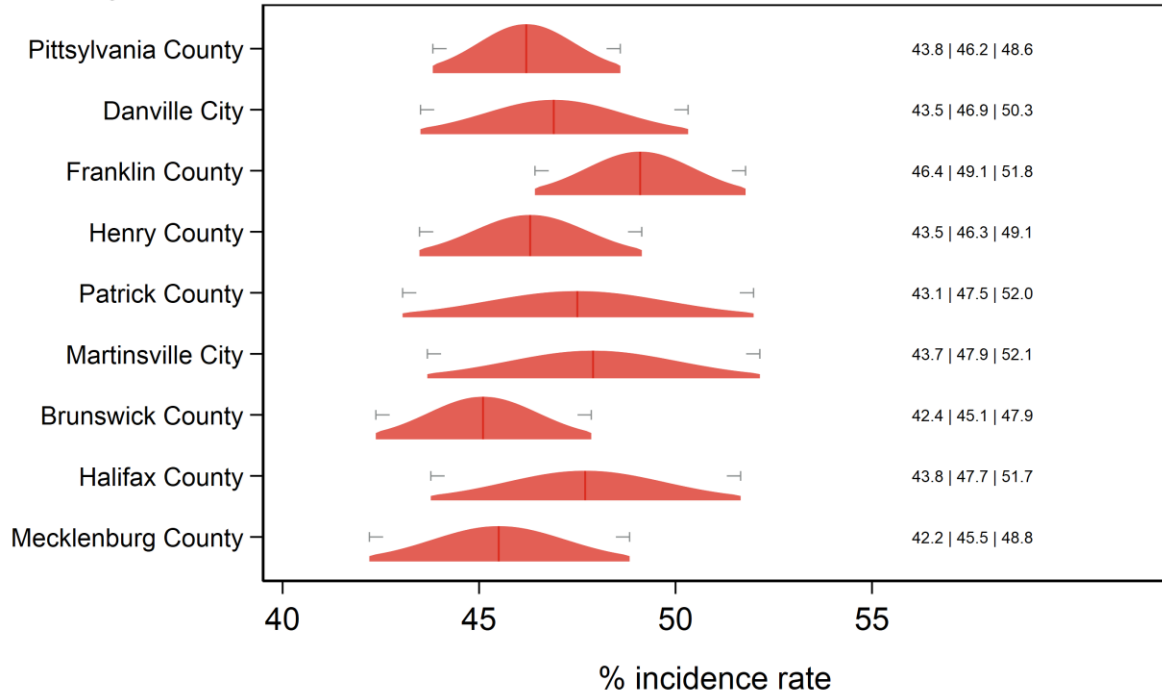
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Pneumonia Vaccination - All Ages Cumberland Plateau and Lenowisco HDs



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

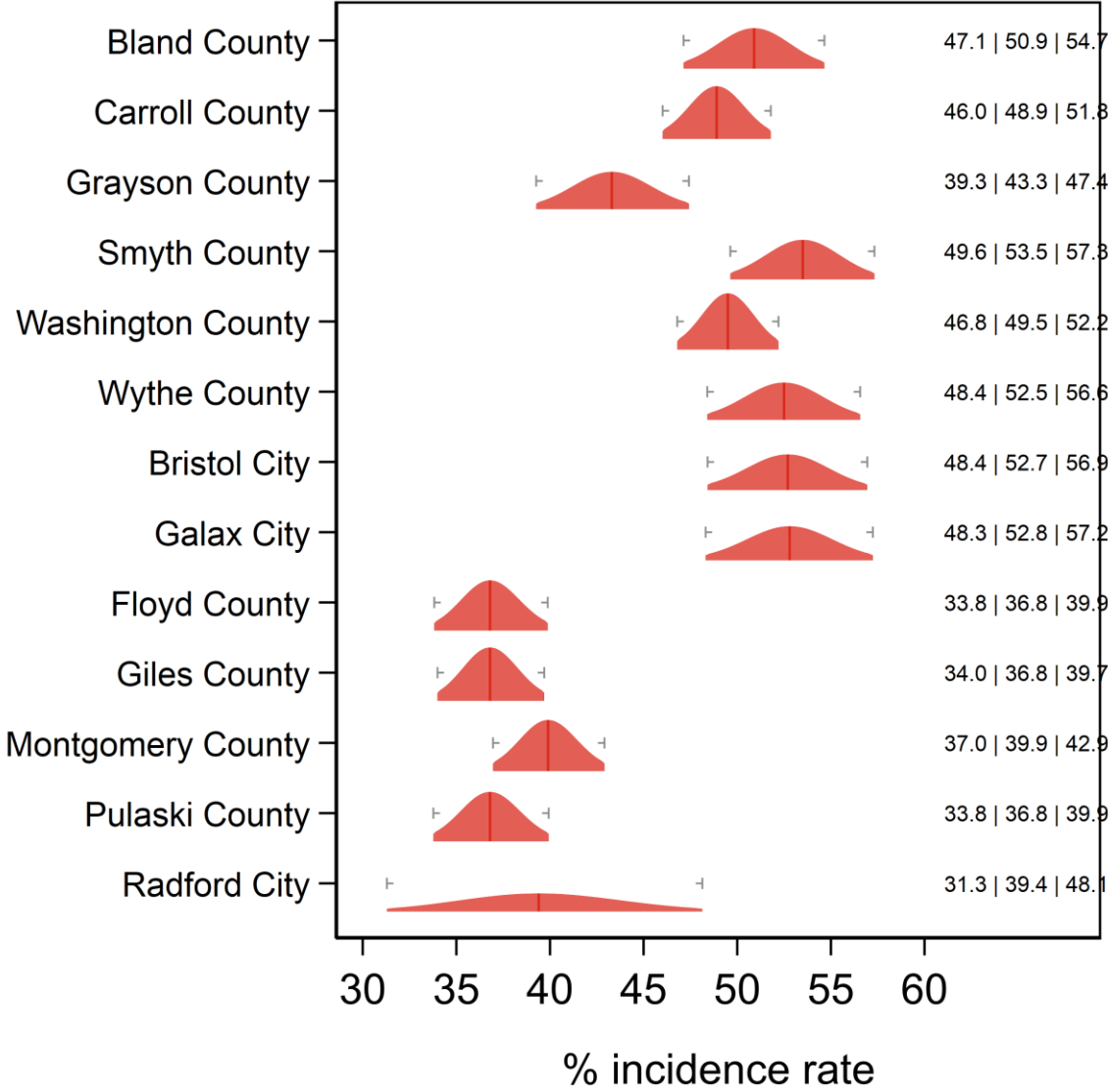
## Pneumonia Vaccination - All Ages Pittsylvania/Danville, Southside and West Piedmont HDs



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

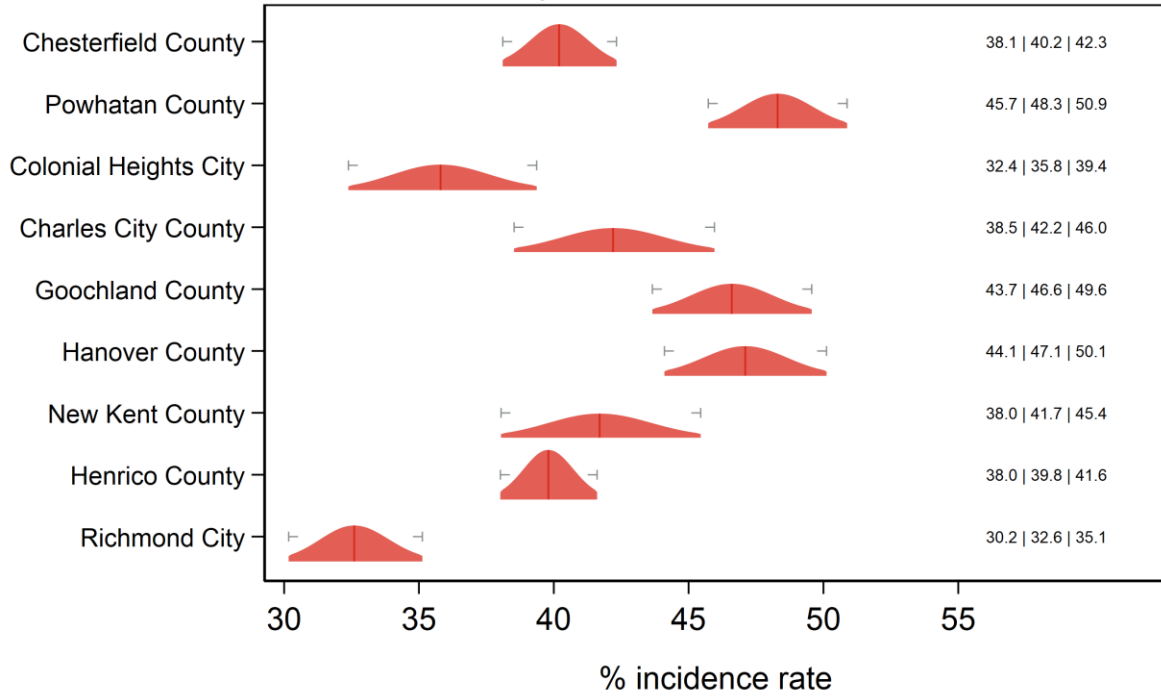


# Pneumonia Vaccination - All Ages New River and Mount Rogers HDs



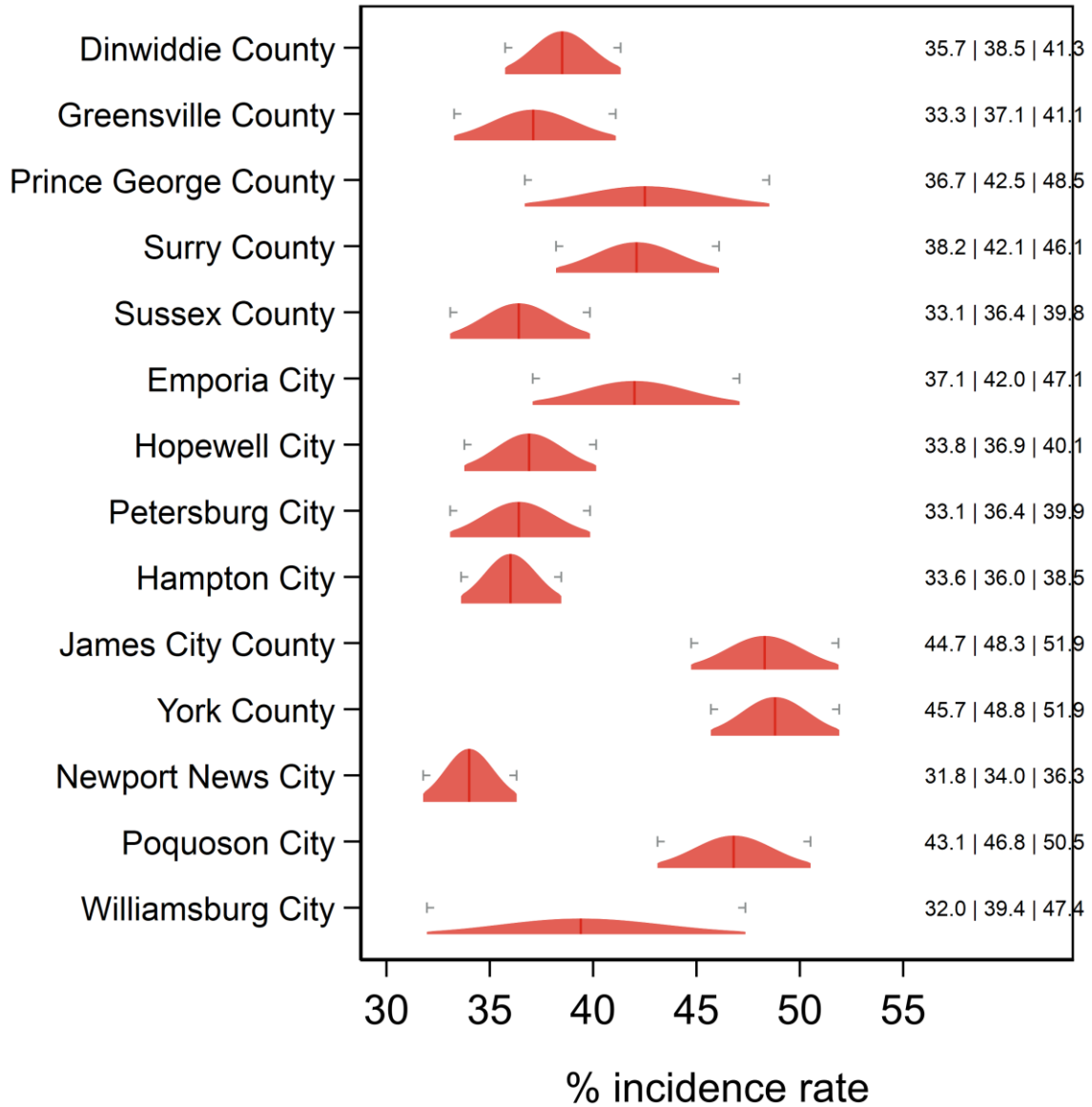
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Pneumonia Vaccination - All Ages Chesterfield, Chickahominy, Henrico and Richmond HDs



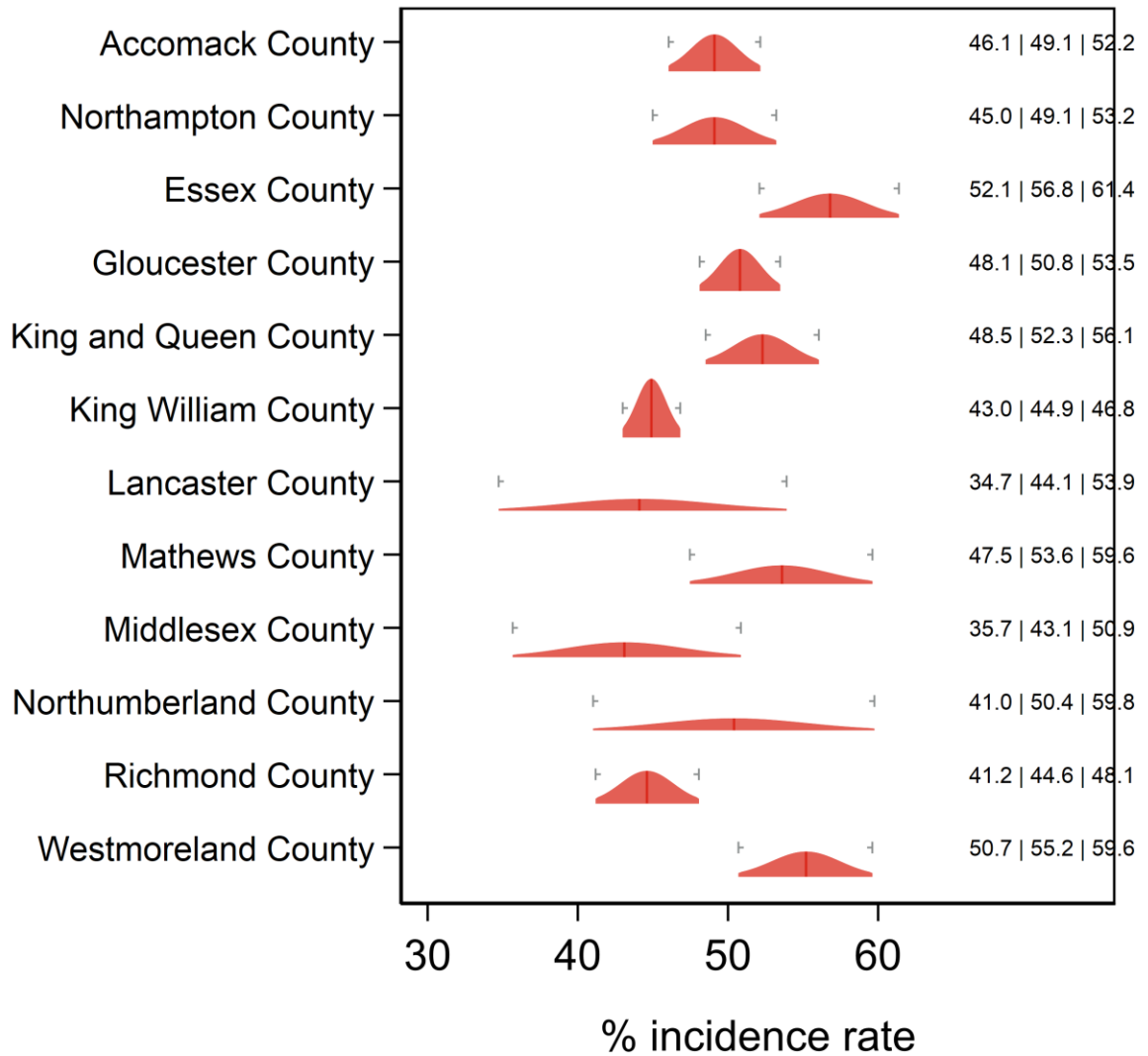
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Pneumonia Vaccination - All Ages Crater, Peninsula and Hampton HDs



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

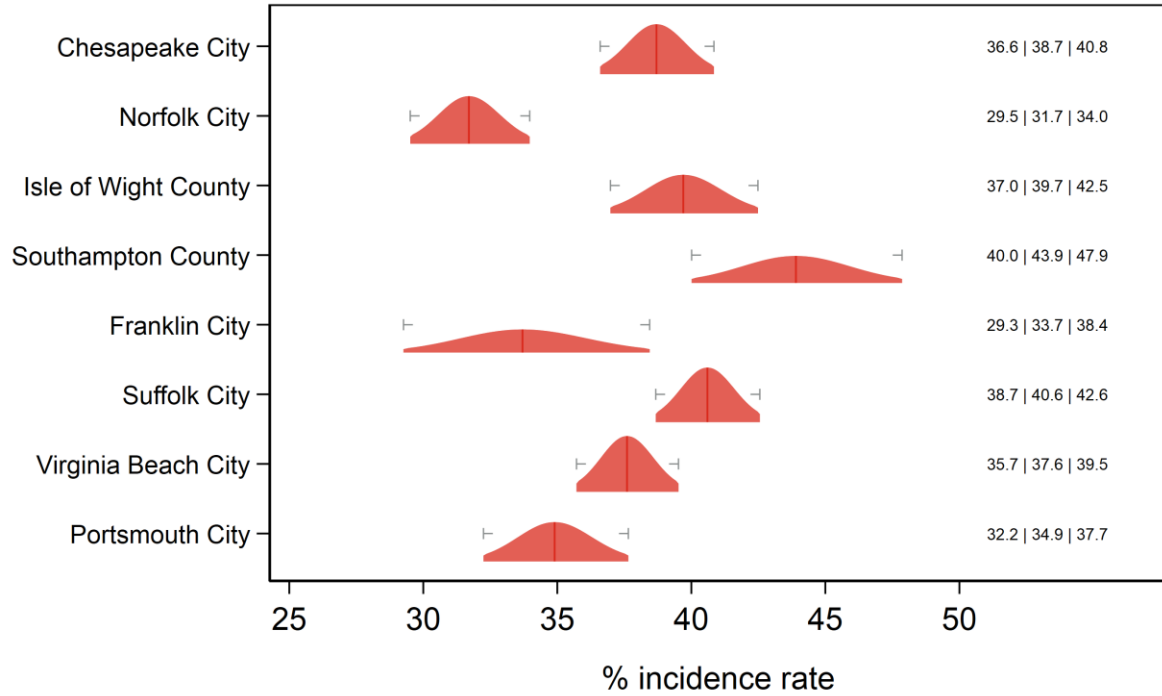
# Pneumonia Vaccination - All Ages Eastern Shore and Three Rivers HDs



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

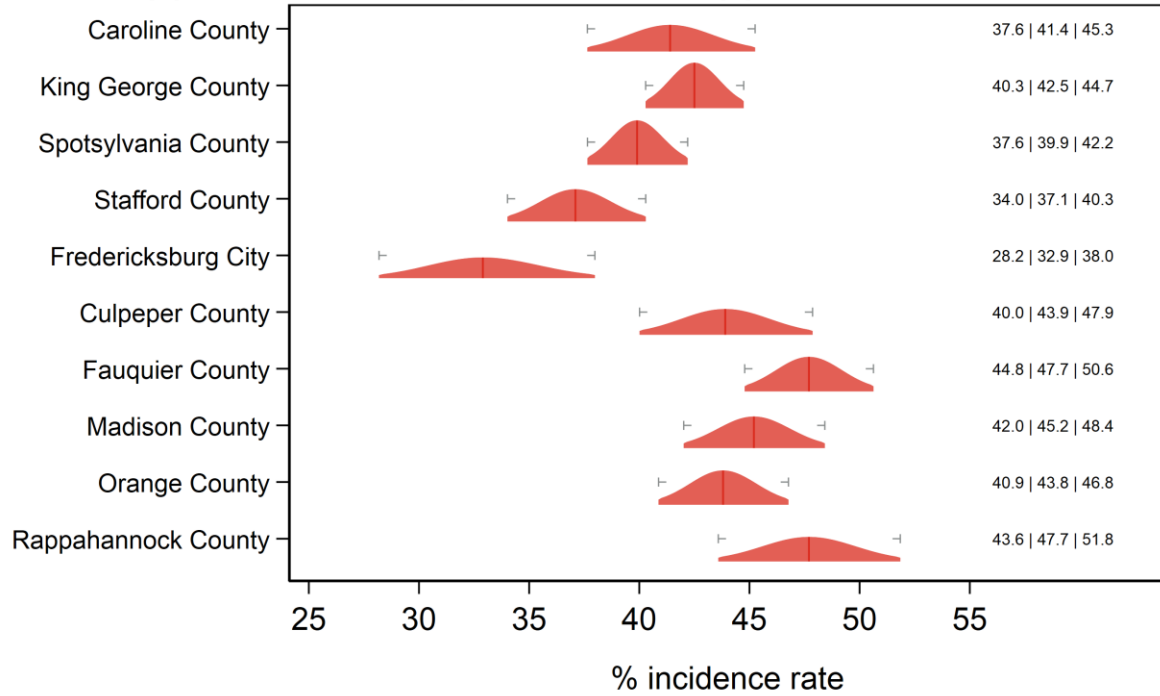
# Pneumonia Vaccination - All Ages

## Norfolk, Portsmouth, Chesapeake, VA Beach, W. Tidewater HDs



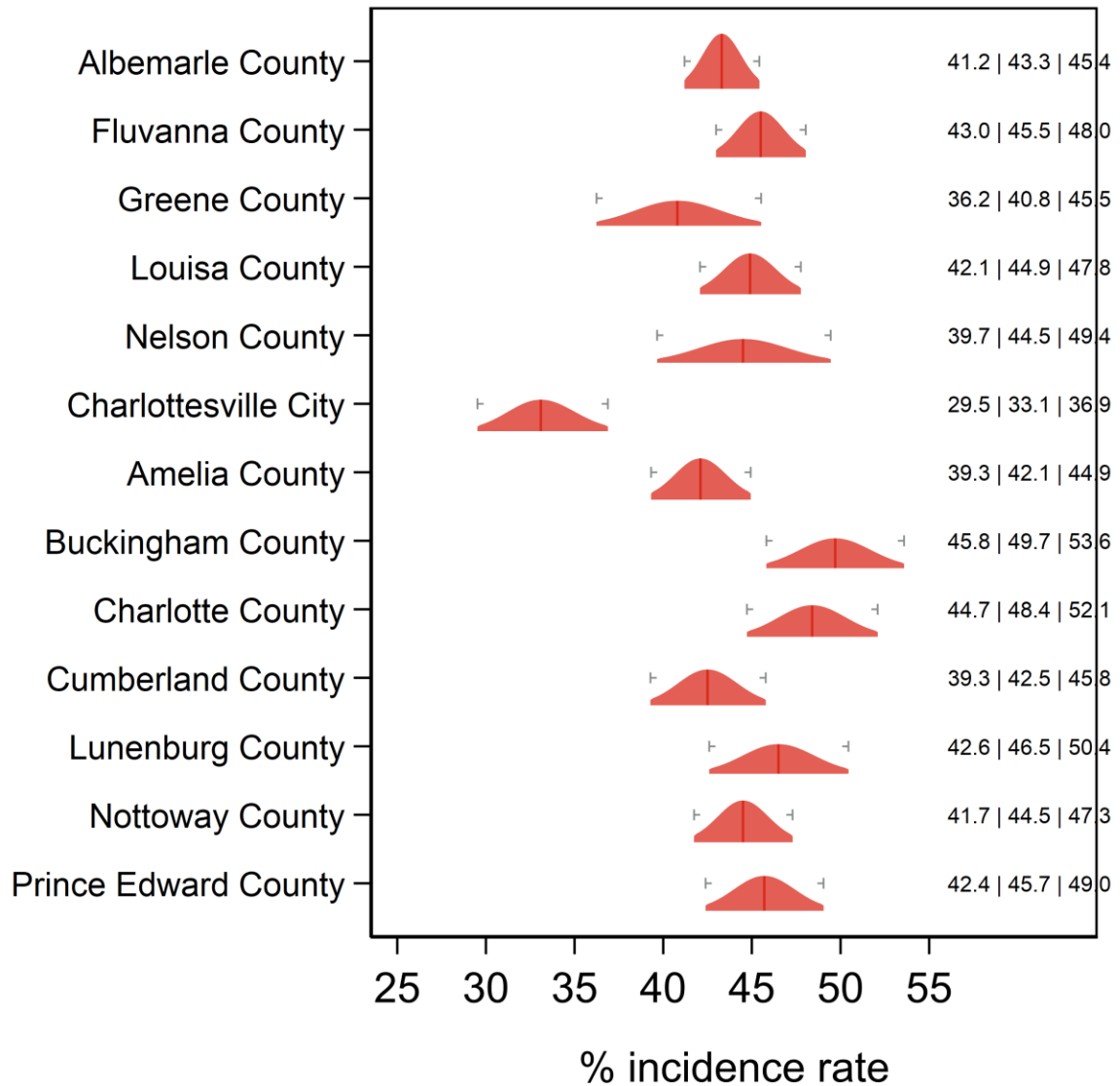
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Pneumonia Vaccination - All Ages Rappahannock/Rapidan and Rappahannock HDs



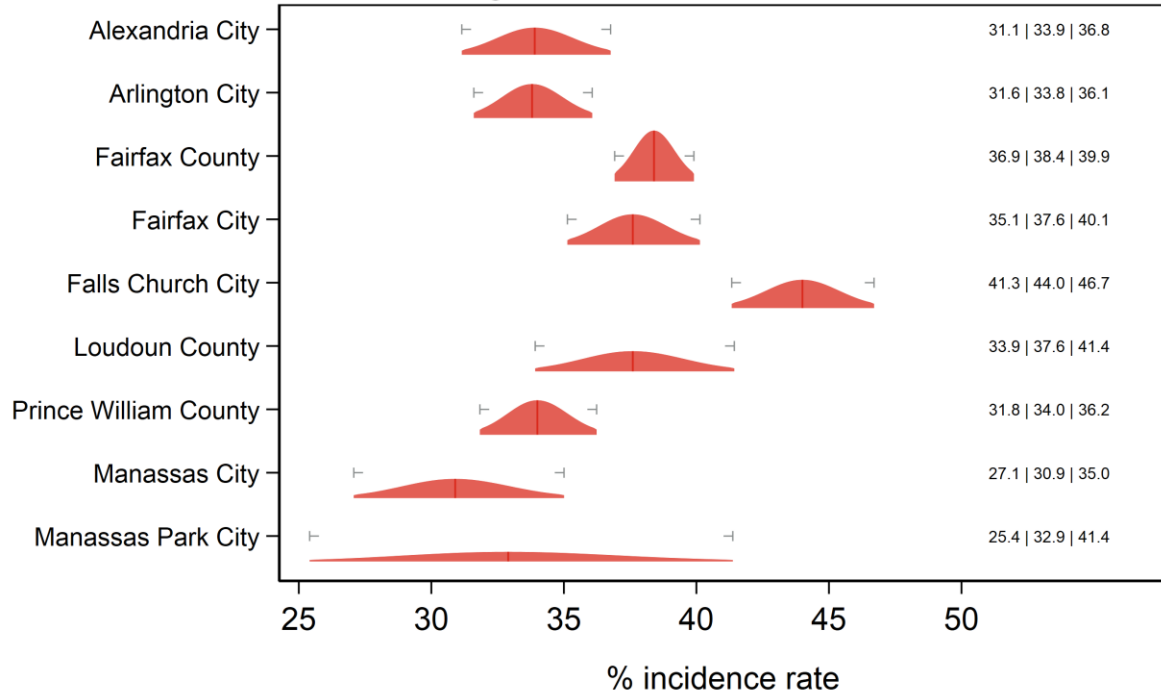
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

# Pneumonia Vaccination - All Ages Thomas Jefferson and Piedmont HDs



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

## Pneumonia Vaccination - All Ages 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: 18 areas.

Direct estimate is outside the 95% SAE Wilson CI: 115 areas.

SAE estimate is inside the 95% direct Wilson CI: 117 areas.

SAE estimate is outside the 95% direct Wilson CI: 16 areas.

SAE Wilson 95% CI is fully inside the 95% direct Wilson CI: 101 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 32 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: 130 areas.

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

Direct standard error is zero: 3 areas.

Proportion of SAE variance due to ACS sampling error: min = 1.70%; med = 17.69%; max = 49.08%.

Proportion of SAE variance due to sampling error in regression coefficient estimates: min = 48.79%; med = 79.92%; max = 96.72%.

Proportion of SAE variance due to model selection: min = 0.00%; med = 1.73%; max = 25.59%.

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