

Outcome 9: Ever had some form of arthritis, rheumatoid arthritis, gout, lupus, o

Internal variable name: outc9_arthritis

Definition: (Ever told) you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?

Predictive models

	Mixed, demos only	Logit, no area effects	Mixed with area covariates
	b/se	b/se	b/se
Outcome 9: Ever had some form of arthritis, rheumatoid arthritis, gout, lupus, o			
NH White	0.0000 (.)	0.0000 (.)	0.0000 (.)
NH Black vs. NH White	-0.1262 (0.0752)	-0.1043 (0.0904)	-0.1043 (0.0786)
NH Asian vs. NH White	-0.4651* (0.2183)	-0.3592 (0.2633)	-0.3592 (0.2018)
NH Other vs. NH White	0.3359* (0.1414)	0.3608* (0.1695)	0.3608* (0.1414)
Hispanic vs. NH White	-0.6037** (0.2297)	-0.5264** (0.1823)	-0.5264* (0.2177)
SEX OF RESPONDENT=1	0.0000 (.)	0.0000 (.)	0.0000 (.)
Female	0.3095*** (0.0662)	0.3093*** (0.0690)	0.3093*** (0.0657)
Age 18-34 vs. 65+	-2.8774*** (0.1563)	-2.8395*** (0.1582)	-2.8395*** (0.1579)
Age 35-44 vs. 65+	-1.8544*** (0.1336)	-1.8334*** (0.1190)	-1.8334*** (0.1330)
Age 45-54 vs. 65+	-1.1152*** (0.0999)	-1.0940*** (0.0960)	-1.0940*** (0.0998)
Age 55-64 vs. 65+	-0.5274*** (0.0709)	-0.5205*** (0.0819)	-0.5205*** (0.0702)
65+	0.0000 (.)	0.0000 (.)	0.0000 (.)
% age 65-74		-1.0985 (2.1335)	-1.0987 (1.9063)
The percentage of the ACS population who have one or more disabilities		3.6944**	3.6944**

		(1.3147)	(1.1870)
Percentage calculated by dividing HHD_Moved_in_ACS_15_19 by Tot_Occp_Units_ACS_1		-0.6842	-0.6843
		(0.6284)	(0.6275)
VA BRFSS 2014 SAE outc21_phys_activity		-1.0866	-1.0865
		(1.0849)	(1.0577)
VA BRFSS 2017 SAE outc9_arthritis		1.1290	1.1290
		(0.6751)	(0.5972)
_cons	-0.0261	0.3170	0.3171
	(0.0715)	(0.9994)	(0.9478)
Area effect variance			
var(_cons[FIPS_county])	0.0929**		0.0000
	(0.0354)		(0.0000)

Number of alternative models used to estimate model error = 6.

Results by health districts

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Augusta County	51015	31.9%	(22.7%, 42.7%)	38.4%	(36.1%, 40.7%)
Bath County	51017	62.9%	(29.2%, 87.4%)	35.1%	(29.7%, 40.8%)
Caroline County	51033	22.9%	(10.1%, 44.0%)	33.9%	(31.8%, 36.1%)
Clarke County	51043	26.9%	(10.3%, 54.1%)	31.2%	(29.0%, 33.5%)
Culpeper County	51047	31.2%	(16.7%, 50.7%)	36.0%	(33.9%, 38.1%)
Fauquier County	51061	24.4%	(14.8%, 37.6%)	33.9%	(31.9%, 36.1%)
Frederick County	51069	25.8%	(16.6%, 37.8%)	33.5%	(31.7%, 35.4%)
Highland County	51091	50.4%	(15.3%, 85.1%)	37.1%	(29.0%, 46.1%)
King George County	51099	32.8%	(14.8%, 57.9%)	30.3%	(28.1%, 32.5%)
Madison County	51113	10.7%	(5.2%, 33.8%)	36.0%	(32.8%, 39.2%)
Orange County	51137	26.5%	(13.2%, 45.9%)	39.6%	(36.8%, 42.6%)
Page County	51139	40.6%	(21.0%, 63.8%)	45.9%	(42.1%, 49.8%)
Rappahannock County	51157	34.4%	(11.2%, 68.6%)	40.6%	(36.4%, 44.9%)
Rockbridge County	51163	25.5%	(13.5%, 43.1%)	37.2%	(34.3%, 40.2%)
Rockingham County	51165	21.7%	(14.4%, 31.4%)	28.1%	(25.2%, 31.2%)
Shenandoah County	51171	31.2%	(19.7%, 45.6%)	39.9%	(37.3%, 42.5%)
Spotsylvania County	51177	20.7%	(14.2%, 29.1%)	31.7%	(29.9%, 33.6%)
Stafford County	51179	14.4%	(10.3%, 21.5%)	24.8%	(23.1%, 26.6%)
Warren County	51187	25.3%	(13.4%, 42.4%)	37.6%	(35.1%, 40.1%)
Buena Vista City	51530	26.7%	(2.9%, 81.5%)	44.3%	(38.0%, 50.8%)
Fredericksburg City	51630	16.4%	(7.4%, 32.5%)	24.8%	(21.3%, 28.7%)
Harrisonburg City	51660	12.4%	(6.0%, 39.8%)	23.1%	(20.2%, 26.3%)
Lexington City	51678	0.0%	(0.0%, 99.4%)	32.0%	(29.6%, 34.5%)
Staunton City	51790	26.4%	(7.6%, 61.1%)	34.0%	(29.8%, 38.6%)
Waynesboro	51820	4.9%	(1.2%, 70.7%)	38.7%	(35.3%, 42.1%)

City					
Winchester City	51840	17.5%	(5.4%, 54.2%)	32.5%	(29.1%, 36.1%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Albemarle County	51003	18.0%	(12.4%, 25.5%)	26.7%	(24.7%, 28.9%)
Alleghany County	51005	28.3%	(15.9%, 45.1%)	43.8%	(40.9%, 46.8%)
Amherst County	51009	24.2%	(13.4%, 39.7%)	42.3%	(39.1%, 45.6%)
Appomattox County	51011	28.0%	(16.8%, 42.9%)	44.4%	(40.0%, 48.9%)
Arlington City	51013	8.7%	(6.3%, 14.2%)	19.0%	(16.1%, 22.2%)
Bedford County	51019	32.8%	(23.9%, 43.1%)	38.6%	(36.5%, 40.8%)
Botetourt County	51023	14.9%	(8.7%, 31.8%)	36.7%	(34.2%, 39.3%)
Campbell County	51031	31.4%	(21.6%, 43.3%)	32.6%	(30.0%, 35.2%)
Craig County	51045	34.5%	(9.8%, 71.9%)	39.3%	(36.3%, 42.4%)
Fairfax County	51059	18.6%	(15.4%, 22.3%)	24.4%	(22.6%, 26.2%)
Fluvanna County	51065	28.0%	(10.6%, 56.1%)	38.5%	(35.9%, 41.1%)
Greene County	51079	44.9%	(15.8%, 78.0%)	32.0%	(27.3%, 37.2%)
Loudoun County	51107	17.4%	(12.8%, 23.1%)	22.4%	(20.5%, 24.5%)
Louisa County	51109	48.0%	(28.5%, 68.0%)	41.1%	(38.0%, 44.2%)
Nelson County	51125	21.9%	(6.2%, 54.3%)	37.3%	(32.7%, 42.1%)
Prince William County	51153	16.9%	(13.0%, 21.7%)	23.2%	(21.2%, 25.4%)
Roanoke County	51161	34.0%	(25.9%, 43.3%)	35.3%	(32.9%, 37.9%)
Alexandria City	51510	12.2%	(7.3%, 19.6%)	20.9%	(17.8%, 24.4%)
Charlottesville City	51540	11.2%	(6.0%, 27.3%)	25.0%	(22.2%, 28.0%)
Covington City	51580	82.8%	(14.0%, 98.3%)	40.7%	(36.7%, 44.9%)
Fairfax City	51600	15.6%	(7.0%, 31.3%)	24.3%	(22.1%, 26.6%)
Falls Church City	51610	21.3%	(4.5%, 61.0%)	26.9%	(22.9%, 31.4%)
Lynchburg City	51680	19.4%	(12.3%, 29.3%)	28.8%	(26.3%, 31.5%)
Manassas City	51683	12.9%	(4.0%, 34.3%)	19.9%	(17.7%, 22.2%)
Manassas Park City	51685	28.1%	(3.5%, 80.8%)	20.2%	(16.8%, 24.1%)
Salem City	51775	7.6%	(3.0%, 53.5%)	32.6%	(30.1%, 35.2%)

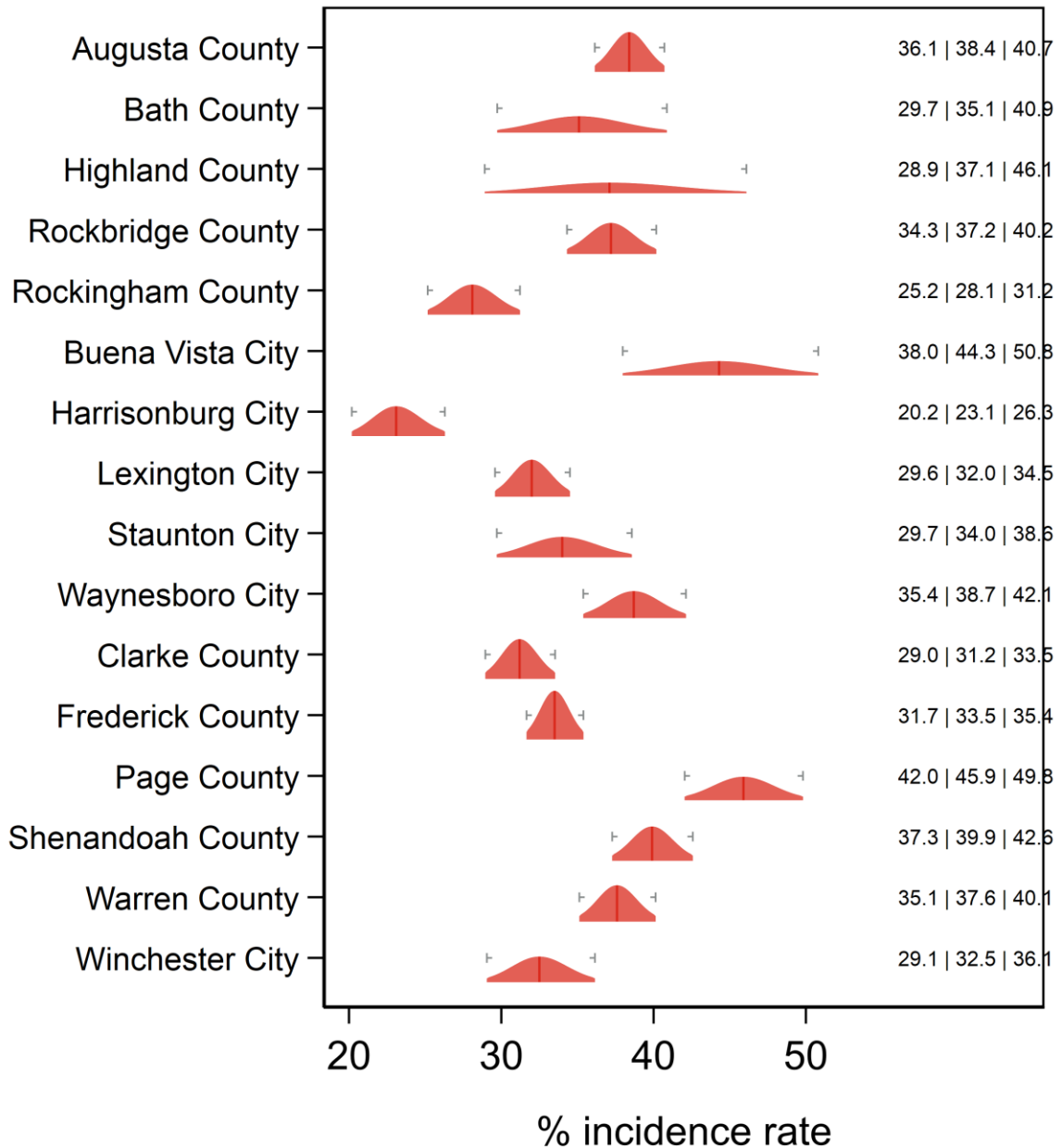
County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Bland County	51021	56.2%	(16.4%, 89.4%)	43.6%	(39.6%, 47.7%)
Buchanan County	51027	17.3%	(8.9%, 37.8%)	57.0%	(51.1%, 62.7%)
Carroll County	51035	19.2%	(5.2%, 50.8%)	45.8%	(42.6%, 49.1%)
Dickenson County	51051	65.3%	(40.8%, 83.8%)	62.4%	(53.2%, 70.8%)
Floyd County	51063	25.1%	(10.2%, 49.7%)	29.6%	(25.8%, 33.7%)
Franklin County	51067	33.1%	(21.1%, 47.9%)	41.3%	(38.6%, 44.1%)
Giles County	51071	19.5%	(6.7%, 45.0%)	29.5%	(26.0%, 33.1%)
Grayson County	51077	55.4%	(30.9%, 77.5%)	51.6%	(45.1%, 58.0%)
Henry County	51089	53.0%	(39.2%, 66.4%)	48.3%	(44.7%, 51.9%)
Lee County	51105	61.7%	(38.9%, 80.3%)	54.9%	(49.4%, 60.3%)
Montgomery County	51121	25.7%	(16.6%, 37.6%)	24.8%	(22.6%, 27.1%)
Patrick County	51141	43.2%	(25.1%, 63.3%)	47.3%	(43.8%, 50.8%)
Pittsylvania County	51143	29.3%	(20.3%, 40.3%)	46.8%	(42.8%, 50.9%)
Pulaski County	51155	34.0%	(18.5%, 53.8%)	34.1%	(30.8%, 37.5%)
Russell County	51167	49.2%	(29.0%, 69.6%)	51.0%	(44.5%, 57.4%)
Scott County	51169	49.7%	(35.8%, 63.7%)	54.7%	(48.7%, 60.6%)
Smyth County	51173	38.0%	(23.3%, 55.2%)	52.1%	(47.2%, 56.9%)
Tazewell County	51185	40.9%	(28.1%, 55.2%)	50.0%	(46.0%, 53.9%)
Washington County	51191	31.2%	(20.5%, 44.5%)	45.8%	(42.3%, 49.4%)
Wise County	51195	45.6%	(33.0%, 58.9%)	56.5%	(50.5%, 62.4%)
Wythe County	51197	47.0%	(30.1%, 64.6%)	47.8%	(43.9%, 51.8%)
Bristol City	51520	29.2%	(3.5%, 82.3%)	49.4%	(44.8%, 54.0%)
Danville City	51590	25.6%	(10.8%, 49.3%)	42.4%	(39.0%, 45.9%)
Galax City	51640	64.7%	(3.6%, 98.7%)	49.6%	(43.5%, 55.7%)
Martinsville City	51690	62.6%	(24.2%, 89.8%)	47.6%	(40.8%, 54.5%)
Norton City	51720	14.9%	(0.7%, 95.1%)	46.2%	(41.3%, 51.2%)
Radford City	51750	21.9%	(9.1%, 43.8%)	27.1%	(24.4%, 30.0%)
Roanoke City	51770	29.2%	(19.5%, 41.3%)	32.9%	(29.9%, 36.1%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Amelia County	51007	67.5%	(40.8%, 86.2%)	39.9%	(36.1%, 43.7%)
Brunswick County	51025	46.4%	(23.3%, 71.1%)	45.3%	(41.6%, 49.0%)
Buckingham County	51029	32.0%	(15.3%, 55.1%)	44.3%	(38.7%, 50.1%)
Charles City County	51036	64.3%	(14.4%, 95.1%)	44.6%	(39.9%, 49.4%)
Charlotte County	51037	14.1%	(7.6%, 36.6%)	47.4%	(40.5%, 54.3%)
Chesterfield County	51041	25.0%	(19.2%, 31.8%)	31.0%	(29.5%, 32.4%)
Cumberland County	51049	30.9%	(10.2%, 63.7%)	43.4%	(38.9%, 48.1%)
Dinwiddie County	51053	37.7%	(21.9%, 56.7%)	38.4%	(35.1%, 41.7%)
Goochland County	51075	35.5%	(11.4%, 70.2%)	35.3%	(32.7%, 38.0%)
Greensville County	51081	42.0%	(18.4%, 70.0%)	40.4%	(35.5%, 45.5%)
Halifax County	51083	42.0%	(28.6%, 56.6%)	46.3%	(41.4%, 51.2%)
Hanover County	51085	32.5%	(21.5%, 45.7%)	34.6%	(32.7%, 36.5%)
Henrico County	51087	21.3%	(15.9%, 28.0%)	30.1%	(28.6%, 31.7%)
Lunenburg County	51111	46.8%	(22.1%, 73.3%)	45.6%	(40.5%, 50.7%)
Mecklenburg County	51117	35.0%	(22.7%, 49.6%)	44.1%	(40.9%, 47.3%)
New Kent County	51127	39.5%	(20.3%, 62.6%)	36.6%	(33.5%, 39.8%)
Nottoway County	51135	27.1%	(13.0%, 48.1%)	44.9%	(40.4%, 49.4%)
Powhatan County	51145	29.3%	(11.2%, 57.7%)	37.2%	(33.8%, 40.8%)
Prince Edward County	51147	36.8%	(19.4%, 58.6%)	42.5%	(37.9%, 47.2%)
Prince George County	51149	45.6%	(26.7%, 65.8%)	37.6%	(34.0%, 41.3%)
Surry County	51181	35.0%	(9.9%, 72.5%)	40.7%	(37.2%, 44.3%)
Sussex County	51183	23.6%	(10.4%, 45.0%)	42.0%	(38.0%, 46.2%)
Colonial Heights City	51570	23.8%	(9.3%, 48.7%)	37.1%	(33.8%, 40.5%)
Emporia City	51595	27.2%	(2.5%, 84.5%)	38.1%	(32.9%, 43.7%)
Hopewell City	51670	26.4%	(10.9%, 51.2%)	35.8%	(32.3%, 39.4%)
Petersburg	51730	19.6%	(10.0%, 34.6%)	38.5%	(33.7%, 43.5%)

City					
Richmond City	51760	17.8%	(12.2%, 25.1%)	25.7%	(22.8%, 28.9%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Accomack County	51001	33.2%	(21.9%, 46.8%)	40.4%	(37.7%, 43.1%)
Essex County	51057	41.6%	(20.5%, 66.3%)	39.6%	(36.7%, 42.6%)
Gloucester County	51073	47.7%	(31.8%, 64.1%)	44.1%	(41.1%, 47.2%)
Isle of Wight County	51093	38.6%	(22.0%, 58.3%)	38.8%	(34.6%, 43.1%)
James City County	51095	29.5%	(20.1%, 41.1%)	31.9%	(28.5%, 35.4%)
King and Queen County	51097	59.5%	(23.2%, 87.8%)	42.0%	(38.1%, 46.0%)
King William County	51101	7.2%	(3.6%, 41.6%)	41.3%	(36.5%, 46.3%)
Lancaster County	51103	22.1%	(11.2%, 38.9%)	41.2%	(35.8%, 46.8%)
Mathews County	51115	52.8%	(32.0%, 72.7%)	46.3%	(41.6%, 51.2%)
Middlesex County	51119	39.2%	(18.3%, 65.1%)	42.7%	(38.5%, 47.0%)
Northampton County	51131	46.9%	(26.4%, 68.5%)	44.2%	(38.2%, 50.4%)
Northumberland County	51133	46.1%	(25.3%, 68.3%)	44.7%	(37.8%, 51.7%)
Richmond County	51159	14.6%	(8.1%, 24.9%)	42.0%	(38.6%, 45.5%)
Southampton County	51175	40.3%	(20.5%, 63.9%)	39.9%	(36.5%, 43.4%)
Westmoreland County	51193	48.9%	(29.7%, 68.3%)	40.1%	(36.6%, 43.8%)
York County	51199	27.3%	(16.2%, 42.1%)	33.8%	(31.9%, 35.7%)
Chesapeake City	51550	27.6%	(21.1%, 35.4%)	31.1%	(29.2%, 33.0%)
Franklin City	51620	36.6%	(10.8%, 73.4%)	33.7%	(31.0%, 36.6%)
Hampton City	51650	30.9%	(23.2%, 40.0%)	33.4%	(31.0%, 35.8%)
Newport News City	51700	20.5%	(14.3%, 28.4%)	29.3%	(26.9%, 31.9%)
Norfolk City	51710	21.3%	(16.0%, 27.7%)	25.1%	(22.6%, 27.8%)
Poquoson City	51735	18.4%	(2.5%, 66.5%)	33.8%	(31.1%, 36.5%)
Portsmouth City	51740	30.8%	(21.8%, 41.5%)	33.2%	(30.6%, 36.0%)
Suffolk City	51800	31.0%	(20.4%, 43.9%)	35.2%	(32.6%, 37.9%)
Virginia Beach City	51810	23.9%	(19.4%, 29.2%)	28.0%	(26.6%, 29.4%)
Williamsburg City	51830	29.7%	(8.0%, 67.3%)	31.9%	(27.5%, 36.7%)

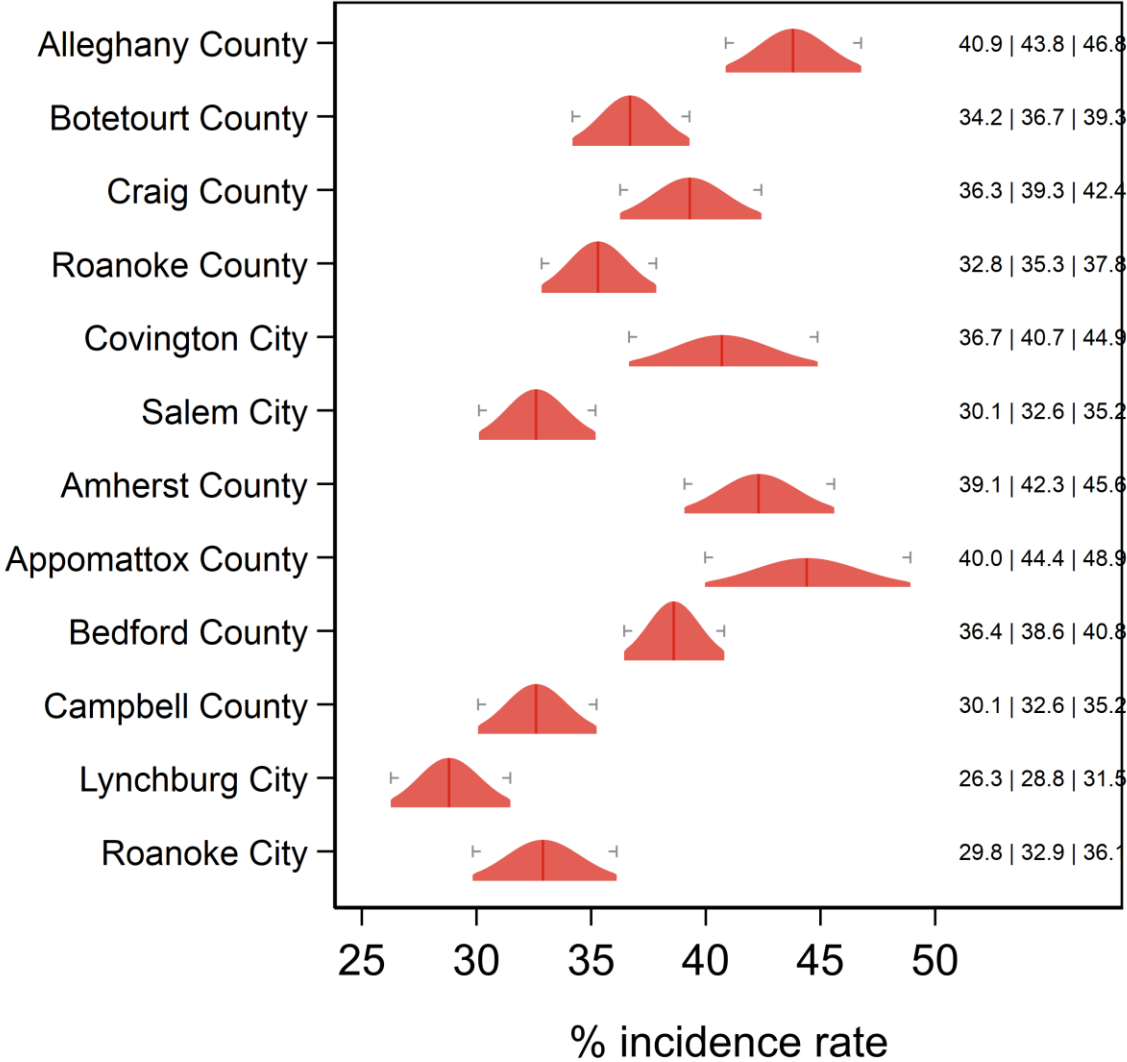
Ever had arthritis Central Shenandoah and Lord Fairfax HDs



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

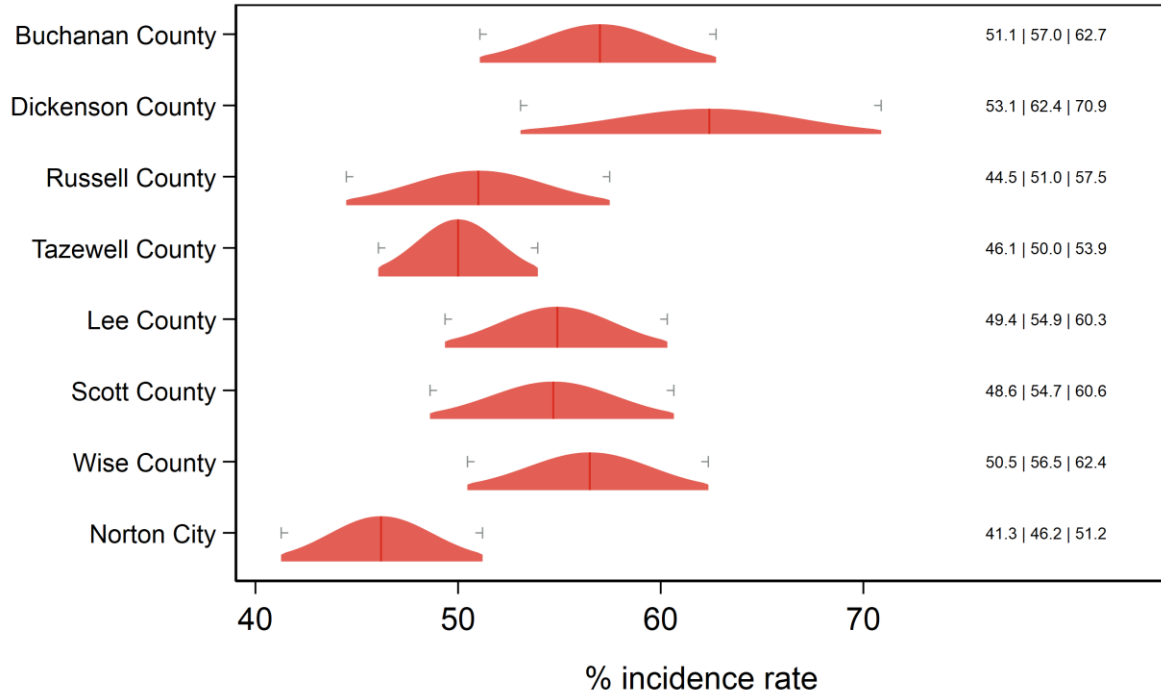
Ever had arthritis

Alleghany, Roanoke and Central Virginia HDs



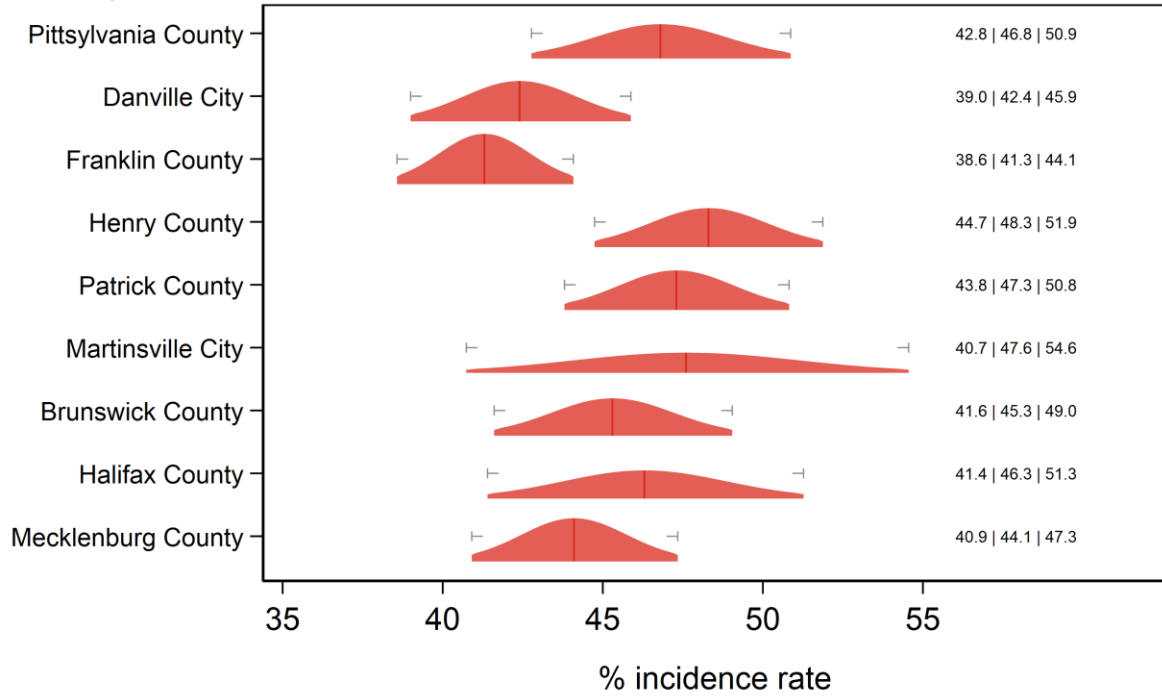
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB
 Gray markers: 95% confidence interval

Ever had arthritis Cumberland Plateau and Lenowisco HDs



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

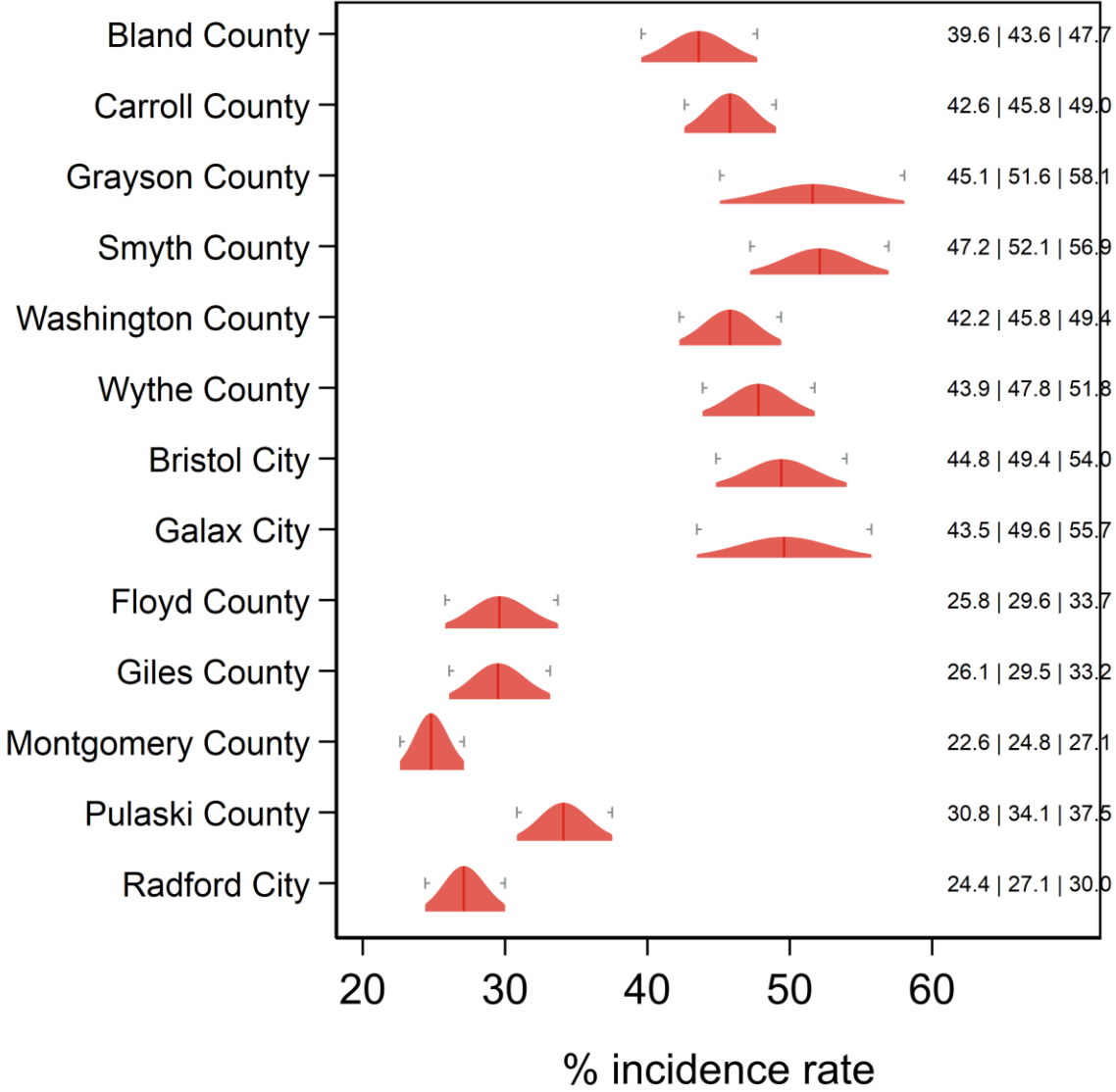
Ever had arthritis Pittsylvania/Danville, Southside and West Piedmont HDs



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

Ever had arthritis

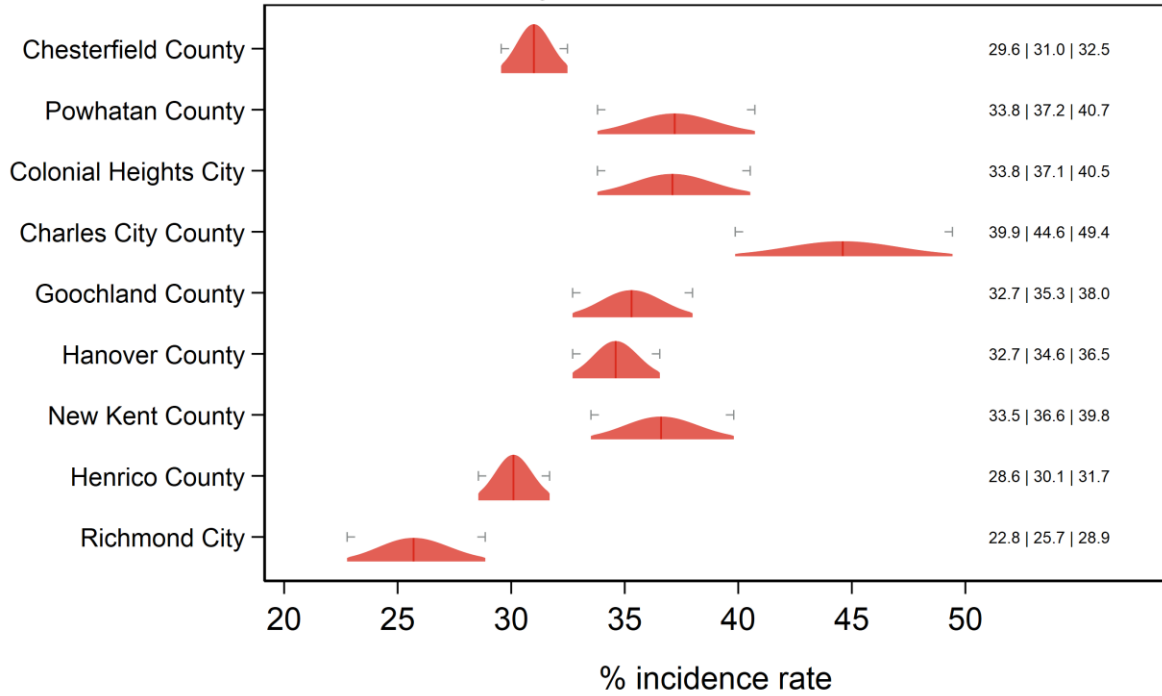
New River and Mount Rogers HDs



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

Ever had arthritis

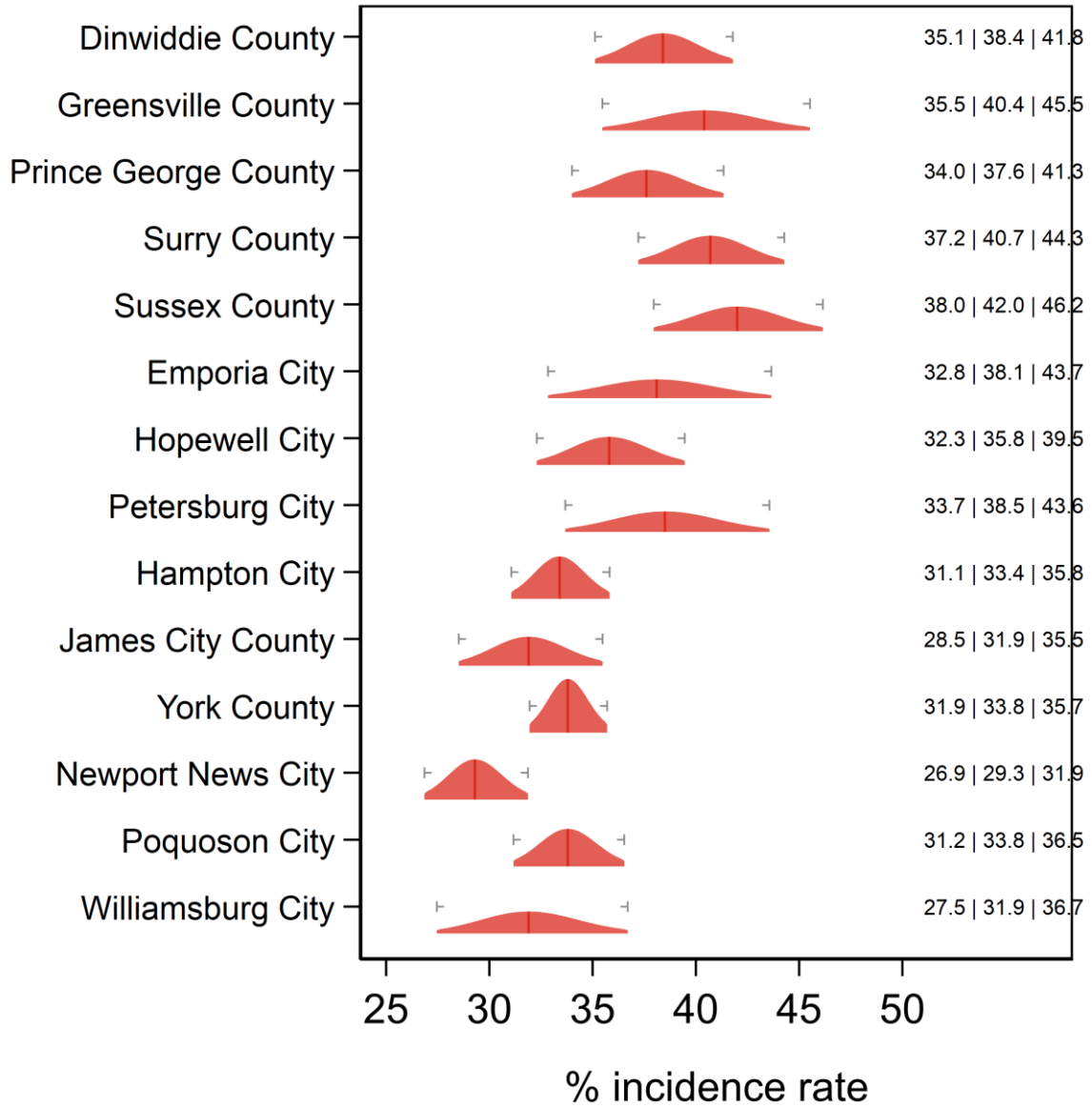
Chesterfield, Chickahominy, Henrico and Richmond HDs



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

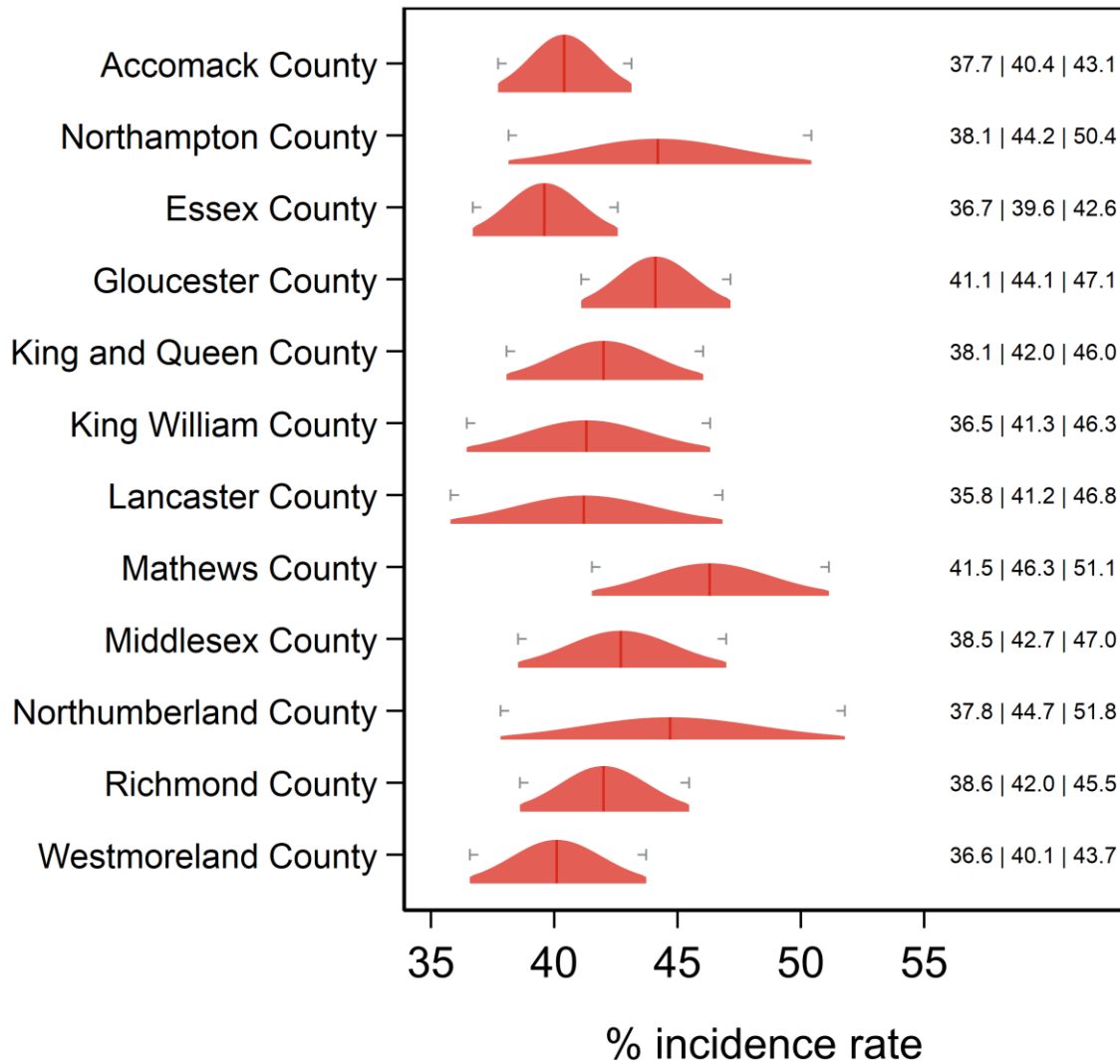
Ever had arthritis

Crater, Peninsula and Hampton HDs



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

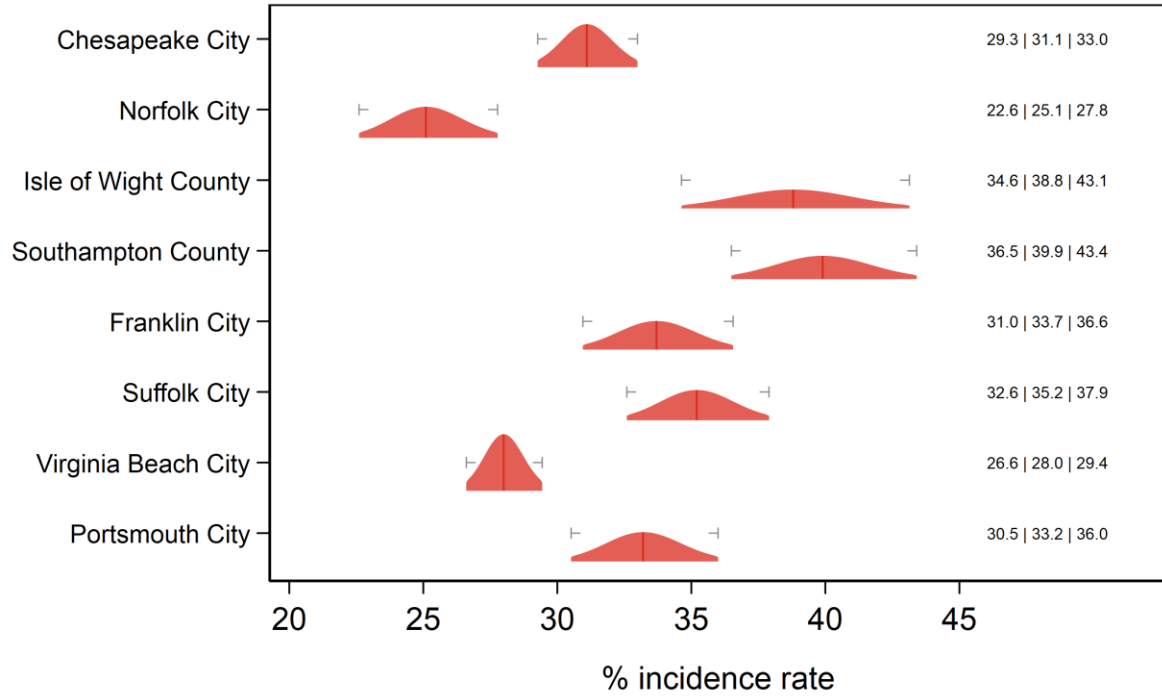
Ever had arthritis Eastern Shore and Three Rivers HDs



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

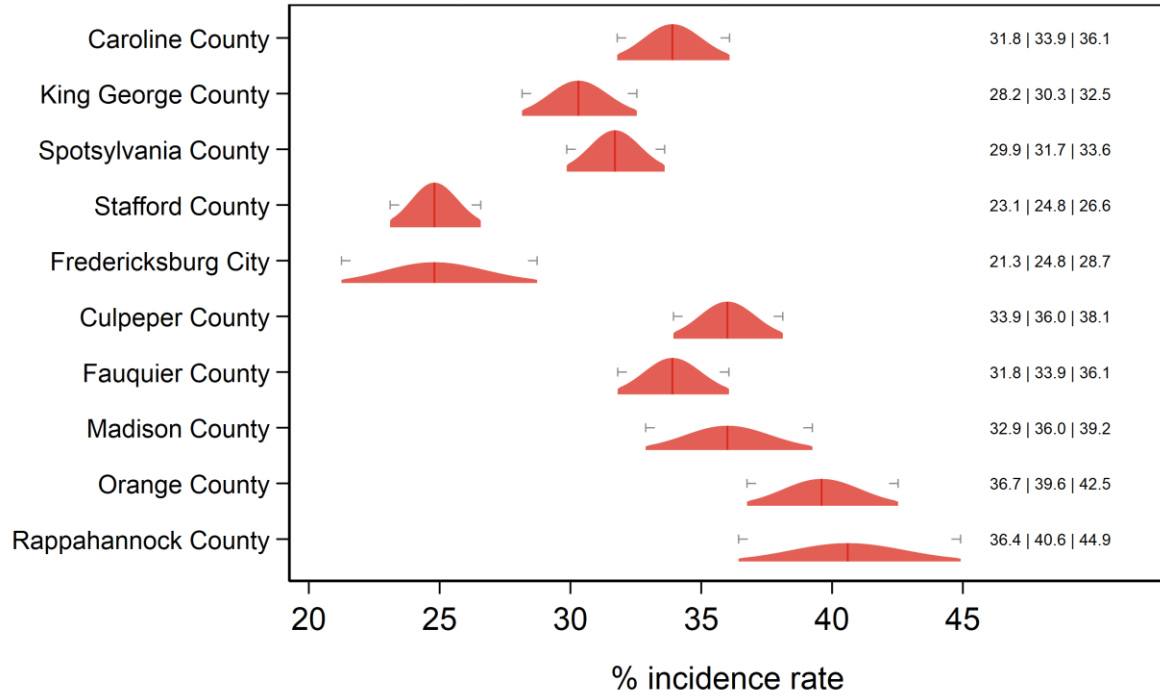
Ever had arthritis

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

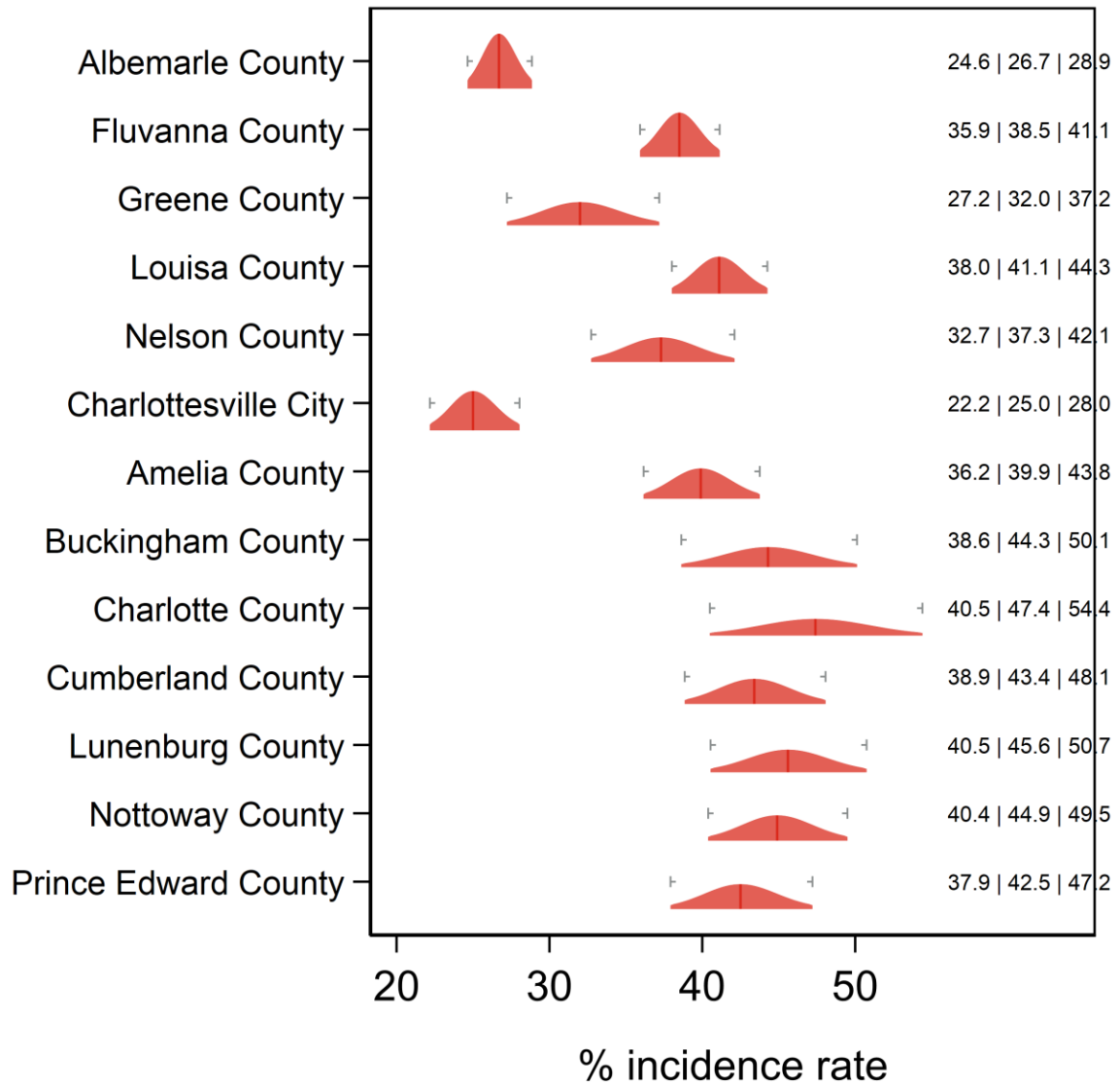
Ever had arthritis Rappahannock/Rapidan and Rappahannock HDs



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

Ever had arthritis

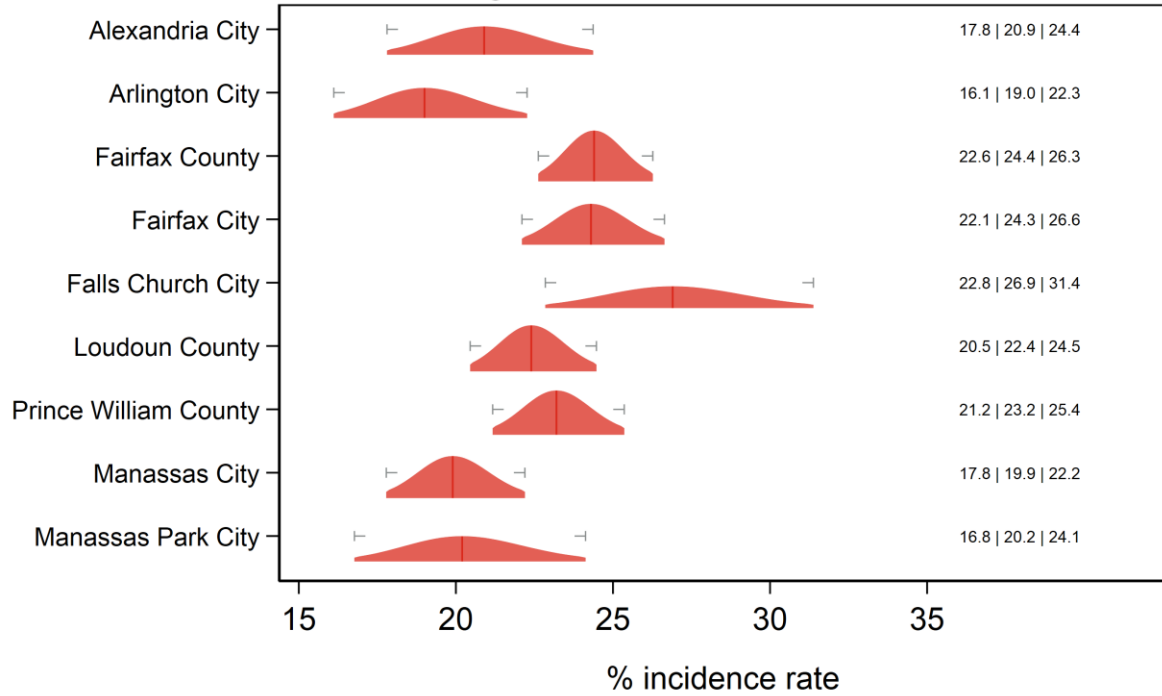
Thomas Jefferson and Piedmont HDs



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

Ever had arthritis

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: 26 areas.

Direct estimate is outside the 95% SAE Wilson CI: 107 areas.

SAE estimate is inside the 95% direct Wilson CI: 111 areas.

SAE estimate is outside the 95% direct Wilson CI: 22 areas.

SAE Wilson 95% CI is fully inside the 95% direct Wilson CI: 99 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 34 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: 132 areas.

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

Direct standard error is zero: 1 areas.

Proportion of SAE variance due to ACS sampling error: min = 1.93%; med = 10.53%; max = 40.96%.

Proportion of SAE variance due to sampling error in regression coefficient estimates: min = 51.68%; med = 86.79%; max = 97.42%.

Proportion of SAE variance due to model selection: min = 0.04%; med = 1.52%; max = 44.21%.

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