

## Indicator 24: Diagnosed with coronary heart disease or angina

Internal variable name: outc24\_heart\_disease

Definition: (Ever told) you had angina or coronary heart disease?

### Predictive models

	Mixed, demos only	Logit, no area effects	Mixed with area covariates
	b/se	b/se	b/se
<b>Outcome 24: Diagnosed with coronary heart disease or angina</b>			
NH Black vs. NH White	-0.1128 (0.1946)	-0.1046 (0.2063)	-0.1046 (0.1892)
NH Asian vs. NH White	-0.9405 (0.5655)	-0.7699 (0.6889)	-0.7699 (0.5367)
NH Other vs. NH White	0.3098 (0.2626)	0.3082 (0.2827)	0.3082 (0.2697)
Hispanic vs. NH White	-0.6749 (0.5303)	-0.4779 (0.3819)	-0.4779 (0.5315)
Female	- 0.6556** *	- 0.6552** *	- 0.6552** *
	(0.1283)	(0.1320)	(0.1284)
Age 18-34 vs. 65+	- 3.0047** *	- 2.9723** *	- 2.9723** *
	(0.5078)	(0.5030)	(0.5103)
Age 35-44 vs. 65+	- 2.5041** *	- 2.4831** *	- 2.4831** *
	(0.4998)	(0.4937)	(0.5022)
Age 45-54 vs. 65+	- 1.2411** *	- 1.2294** *	- 1.2294** *
	(0.2232)	(0.2355)	(0.2207)
Age 55-64 vs. 65+	- 0.6169** *	- 0.6238** *	- 0.6238** *
	(0.1412)	(0.1437)	(0.1423)
% education Bachelor+, population 25+ y/o		0.0487**	0.0487** *
		(0.0163)	(0.0138)
Average aggregate household income per occupied housing unit in the ACS		-0.0140	-0.0140*
		(0.0076)	(0.0058)

Melanoma Female Rate		-0.0141*	-0.0141*
		(0.0066)	(0.0059)
VA BRFSS 2014 SAE outc13_arthritis		0.4167	0.4167
		(2.0845)	(1.6159)
% veterans		0.0735**	0.0735**
			*
		(0.0230)	(0.0202)
% below PL, White alone		0.1532**	0.1532**
			*
		(0.0505)	(0.0442)
Crude mortality rate of alzheimer-s disease per 10K		0.0656	0.0656
		(0.1148)	(0.1044)
c.ACS_pct_white_poor#c.rate_cod_alzheimersdisease		-0.0207	-0.0207
		(0.0127)	(0.0119)
% renter occupied HUs, ACS 2016 5yr		-	-
		0.0387**	0.0387**
		(0.0146)	(0.0129)
Crude mortality rate of nephritis, nephrotic syndrome & nephrosis per 10K		-0.0032	-0.0032
		(0.1440)	(0.0962)
c.PDB_pct_renter_occp_hu_ACS126#c.rate_cod_nephritisnephrotic syndr		0.0050	0.0050
		(0.0042)	(0.0029)
Intercept	-	-	-
	1.8071**	2.8721**	2.8721**
	*	*	*
	(0.0898)	(0.8675)	(0.7477)
Area effect variance			
	0.0000**		0.0000**
	*		*
	(0.0000)		(0.0000)

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

Results

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Augusta County	51015	3.4%	(2.3%, 9.6%)	5.4%	(4.3%, 6.8%)
Bath County	51017	8.1%	(1.9%, 45.5%)	11.5%	(6.6%, 19.2%)
Caroline County	51033	13.8%	(3.9%, 38.7%)	6.4%	(5.2%, 7.8%)
Clarke County	51043	0.0%	(0.0%, 25.3%)	4.8%	(3.6%, 6.3%)
Culpeper County	51047	1.1%	(0.6%, 11.8%)	3.4%	(2.5%, 4.5%)
Fauquier County	51061	2.7%	(1.8%, 13.2%)	5.0%	(3.9%, 6.4%)
Frederick County	51069	1.5%	(0.9%, 10.2%)	3.9%	(3.2%, 4.9%)
Highland County	51091	0.0%	(0.0%, 47.5%)	7.7%	(4.4%, 13.0%)
King George County	51099	2.7%	(1.5%, 39.2%)	6.1%	(4.5%, 8.3%)
Madison County	51113	8.7%	(1.3%, 39.8%)	3.4%	(2.3%, 5.2%)
Orange County	51137	6.0%	(3.2%, 20.9%)	4.9%	(4.0%, 6.0%)
Page County	51139	0.0%	(0.0%, 19.8%)	2.9%	(1.8%, 4.7%)
Rappahannock County	51157	4.3%	(1.6%, 33.7%)	5.2%	(4.0%, 6.9%)
Rockbridge County	51163	7.6%	(1.9%, 25.9%)	8.5%	(6.7%, 10.7%)
Rockingham County	51165	2.6%	(0.7%, 9.7%)	4.1%	(3.1%, 5.5%)
Shenandoah County	51171	1.9%	(0.8%, 14.7%)	4.4%	(3.3%, 5.8%)
Spotsylvania County	51177	3.3%	(1.9%, 10.2%)	5.1%	(4.1%, 6.3%)
Stafford County	51179	2.6%	(1.3%, 8.1%)	5.5%	(4.2%, 7.2%)
Warren County	51187	7.9%	(2.3%, 23.8%)	8.1%	(6.3%, 10.2%)
Buena Vista City	51530	0.0%	(0.0%, 45.0%)	6.2%	(2.5%, 14.5%)
Fredericksburg City	51630	0.0%	(0.0%, 20.9%)	2.6%	(1.4%, 4.7%)
Harrisonburg City	51660	0.0%	(0.0%, 44.6%)	2.8%	(1.5%, 5.4%)
Lexington City	51678	0.0%	(0.0%, 96.3%)	0.3%	(0.0%, 13.5%)
Staunton City	51790	0.0%	(0.0%, 43.5%)	3.6%	(1.9%, 6.8%)
Waynesboro City	51820	0.0%	(0.0%, 42.1%)	5.1%	(3.8%, 6.9%)
Winchester City	51840	0.0%	(0.0%, 60.4%)	3.0%	(1.8%, 5.0%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Albemarle County	51003	5.8%	(2.5%, 13.1%)	4.9%	(3.5%, 6.9%)
Alleghany County	51005	30.7%	(7.4%, 71.1%)	15.7%	(11.2%, 21.5%)
Amherst County	51009	0.0%	(0.0%, 16.7%)	7.3%	(5.9%, 9.0%)
Appomattox County	51011	6.9%	(2.5%, 27.3%)	11.7%	(8.6%, 15.7%)
Arlington City	51013	2.6%	(1.6%, 7.4%)	2.7%	(1.9%, 3.9%)
Bedford County	51019	6.3%	(2.6%, 14.4%)	7.8%	(6.5%, 9.3%)
Botetourt County	51023	6.0%	(2.9%, 23.4%)	6.2%	(4.7%, 8.1%)
Campbell County	51031	5.8%	(2.3%, 13.9%)	6.1%	(5.0%, 7.5%)
Craig County	51045	0.0%	(0.0%, 68.2%)	9.0%	(5.7%, 13.8%)
Fairfax County	51059	2.3%	(1.7%, 3.6%)	3.6%	(3.0%, 4.3%)
Fluvanna County	51065	3.4%	(0.6%, 18.2%)	5.7%	(4.3%, 7.4%)
Greene County	51079	0.0%	(0.0%, 34.9%)	2.2%	(1.2%, 4.0%)
Loudoun County	51107	3.7%	(1.8%, 7.4%)	4.4%	(3.4%, 5.8%)
Louisa County	51109	4.3%	(2.3%, 18.2%)	6.9%	(5.6%, 8.5%)
Nelson County	51125	0.0%	(0.0%, 28.6%)	9.7%	(6.5%, 14.2%)
Prince William County	51153	2.6%	(1.8%, 5.2%)	3.5%	(2.8%, 4.4%)
Roanoke County	51161	2.6%	(1.8%, 8.2%)	5.3%	(4.1%, 6.9%)
Alexandria City	51510	1.0%	(0.6%, 6.1%)	2.8%	(2.1%, 3.9%)
Charlottesville City	51540	2.0%	(1.2%, 20.8%)	3.3%	(2.2%, 5.0%)
Covington City	51580	0.0%	(0.0%, 87.4%)	38.9%	(16.9%, 66.6%)
Fairfax City	51600	1.9%	(0.9%, 9.7%)	3.3%	(2.4%, 4.6%)
Falls Church City	51610	1.5%	(1.0%, 26.8%)	6.4%	(4.0%, 10.1%)
Lynchburg City	51680	1.9%	(1.0%, 9.8%)	4.1%	(2.8%, 6.0%)
Manassas City	51683	1.4%	(0.8%, 34.2%)	1.6%	(1.0%, 2.4%)
Manassas Park City	51685	0.0%	(0.0%, 76.5%)	2.9%	(1.9%, 4.5%)
Salem City	51775	1.6%	(0.8%, 43.3%)	2.4%	(1.3%, 4.5%)

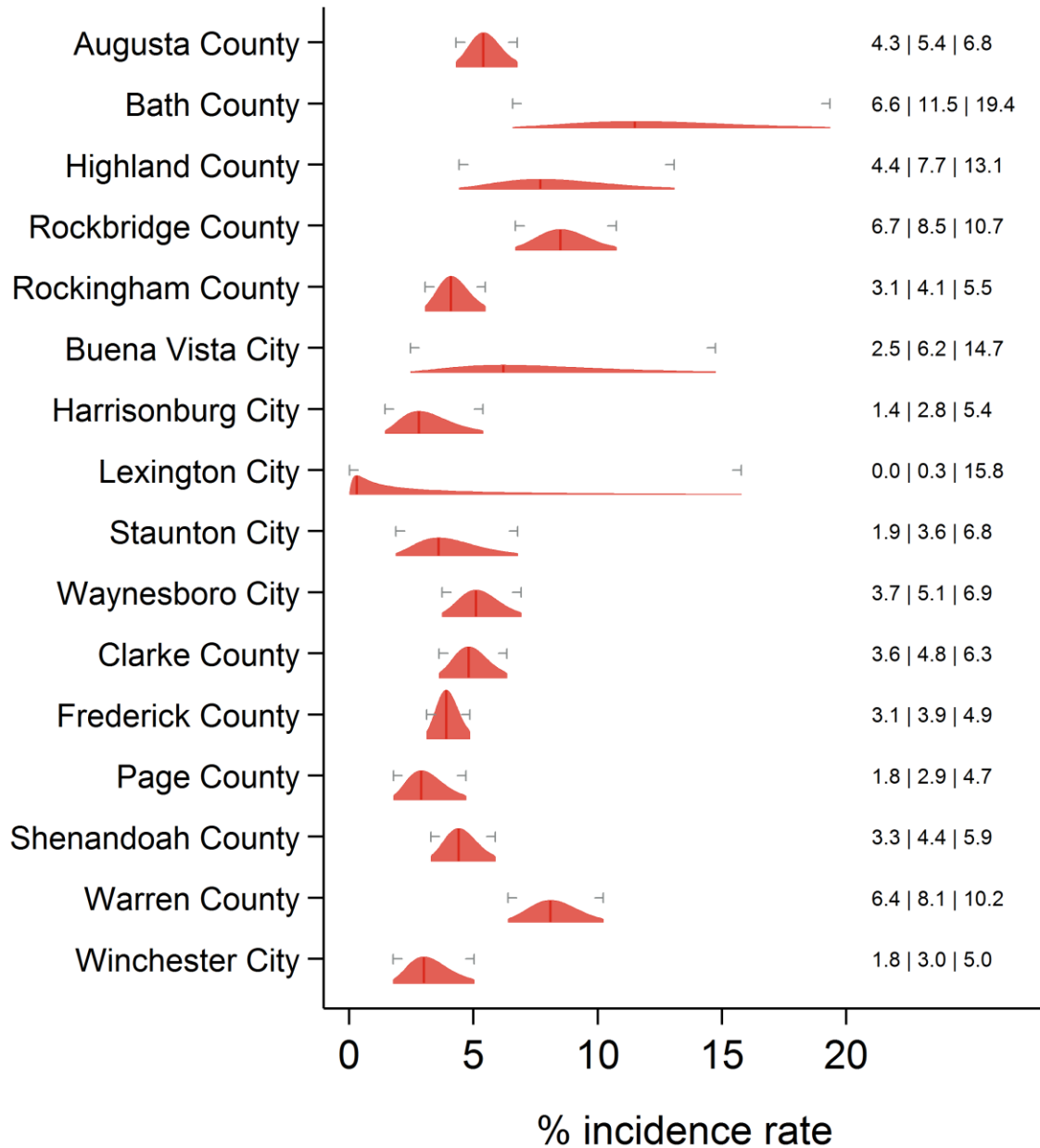
County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Bland County	51021	5.3%	(1.8%, 42.7%)	7.9%	(5.7%, 10.9%)
Buchanan County	51027	11.8%	(4.2%, 28.8%)	15.1%	(9.3%, 23.4%)
Carroll County	51035	8.4%	(1.9%, 29.6%)	15.5%	(10.5%, 22.3%)
Dickenson County	51051	0.0%	(0.0%, 19.8%)	11.9%	(6.3%, 21.3%)
Floyd County	51063	0.9%	(0.7%, 18.1%)	3.2%	(2.2%, 4.5%)
Franklin County	51067	0.8%	(0.5%, 14.9%)	5.9%	(4.8%, 7.2%)
Giles County	51071	5.1%	(0.8%, 25.2%)	5.7%	(3.7%, 8.8%)
Grayson County	51077	0.0%	(0.0%, 22.0%)	2.9%	(0.8%, 10.5%)
Henry County	51089	5.3%	(2.4%, 16.8%)	7.0%	(5.1%, 9.7%)
Lee County	51105	6.5%	(3.2%, 33.9%)	20.3%	(12.9%, 30.7%)
Montgomery County	51121	4.0%	(2.6%, 11.7%)	6.8%	(4.7%, 9.6%)
Patrick County	51141	13.2%	(3.2%, 41.3%)	13.6%	(9.6%, 18.8%)
Pittsylvania County	51143	5.1%	(2.3%, 11.0%)	7.7%	(6.2%, 9.5%)
Pulaski County	51155	13.9%	(4.2%, 37.2%)	7.5%	(5.4%, 10.5%)
Russell County	51167	7.0%	(2.0%, 21.4%)	8.4%	(6.3%, 11.0%)
Scott County	51169	5.5%	(1.6%, 17.7%)	11.1%	(8.1%, 15.1%)
Smyth County	51173	4.2%	(2.4%, 32.0%)	11.2%	(8.8%, 14.1%)
Tazewell County	51185	3.2%	(2.1%, 15.4%)	5.0%	(3.2%, 7.6%)
Washington County	51191	6.8%	(4.0%, 15.8%)	8.3%	(6.9%, 9.9%)
Wise County	51195	13.9%	(6.9%, 25.9%)	11.8%	(8.0%, 17.1%)
Wythe County	51197	16.2%	(7.0%, 33.2%)	10.8%	(8.1%, 14.4%)
Bristol City	51520	22.0%	(2.3%, 76.7%)	4.6%	(1.7%, 12.0%)
Danville City	51590	0.7%	(0.5%, 19.5%)	6.2%	(4.6%, 8.3%)
Galax City	51640	0.0%	(0.0%, 88.6%)	1.3%	(0.3%, 6.3%)
Martinsville City	51690	0.0%	(0.0%, 51.3%)	1.9%	(0.7%, 4.7%)
Norton City	51720	0.0%	(0.0%, 60.5%)	12.9%	(4.4%, 32.2%)
Radford City	51750	3.8%	(1.5%, 44.8%)	10.3%	(4.8%, 20.7%)
Roanoke City	51770	4.2%	(1.5%, 11.2%)	5.7%	(4.0%, 8.0%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Amelia County	51007	5.6%	(3.1%, 35.5%)	4.4%	(3.0%, 6.3%)
Brunswick County	51025	18.7%	(6.5%, 43.3%)	5.9%	(3.9%, 8.7%)
Buckingham County	51029	5.1%	(1.2%, 18.5%)	8.1%	(5.6%, 11.4%)
Charles City County	51036	0.0%	(0.0%, 51.5%)	6.6%	(4.4%, 9.6%)
Charlotte County	51037	4.9%	(2.0%, 20.7%)	7.3%	(5.0%, 10.5%)
Chesterfield County	51041	4.6%	(2.5%, 8.2%)	5.4%	(4.5%, 6.4%)
Cumberland County	51049	5.5%	(2.5%, 27.1%)	11.6%	(8.7%, 15.3%)
Dinwiddie County	51053	17.9%	(2.7%, 63.2%)	6.8%	(4.7%, 9.6%)
Goochland County	51075	0.0%	(0.0%, 23.5%)	3.5%	(2.3%, 5.5%)
Greensville County	51081	0.0%	(0.0%, 37.1%)	8.7%	(5.1%, 14.6%)
Halifax County	51083	1.4%	(1.0%, 11.7%)	8.7%	(6.5%, 11.6%)
Hanover County	51085	4.8%	(1.7%, 12.9%)	5.5%	(4.4%, 6.8%)
Henrico County	51087	4.1%	(1.9%, 8.6%)	4.3%	(3.5%, 5.4%)
Lunenburg County	51111	5.7%	(2.8%, 33.0%)	5.2%	(4.1%, 6.7%)
Mecklenburg County	51117	9.1%	(4.3%, 18.1%)	7.0%	(5.9%, 8.3%)
New Kent County	51127	4.1%	(1.4%, 27.9%)	4.8%	(3.6%, 6.5%)
Nottoway County	51135	4.2%	(2.4%, 34.9%)	6.5%	(3.3%, 12.4%)
Powhatan County	51145	10.3%	(1.6%, 44.9%)	4.9%	(3.5%, 7.0%)
Prince Edward County	51147	0.0%	(-0.0%, 12.4%)	4.5%	(2.8%, 7.3%)
Prince George County	51149	3.7%	(1.2%, 11.2%)	4.5%	(3.0%, 6.9%)
Surry County	51181	0.0%	(-0.0%, 33.3%)	4.3%	(3.0%, 6.0%)
Sussex County	51183	3.2%	(2.0%, 18.3%)	3.6%	(2.3%, 5.6%)
Colonial Heights City	51570	7.1%	(3.6%, 27.1%)	5.2%	(3.8%, 7.0%)
Emporia City	51595	37.1%	(1.4%, 96.5%)	47.6%	(21.8%, 74.7%)
Hopewell City	51670	3.0%	(1.9%, 23.5%)	6.5%	(4.8%, 8.7%)
Petersburg City	51730	5.3%	(1.3%, 19.9%)	11.1%	(7.5%, 16.0%)
Richmond City	51760	1.7%	(0.5%, 5.0%)	3.1%	(2.2%, 4.5%)

County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Accomack County	51001	3.4%	(2.0%, 13.1%)	9.1%	(6.6%, 12.5%)
Essex County	51057	0.0%	(-0.0%, 25.9%)	3.9%	(2.4%, 6.3%)
Gloucester County	51073	2.7%	(1.6%, 11.9%)	5.4%	(4.0%, 7.3%)
Isle of Wight County	51093	4.1%	(1.9%, 20.5%)	6.0%	(4.7%, 7.7%)
James City County	51095	6.1%	(2.6%, 13.5%)	10.7%	(7.2%, 15.7%)
King and Queen County	51097	0.0%	(-0.0%, 31.6%)	5.7%	(3.2%, 9.8%)
King William County	51101	4.2%	(1.5%, 32.2%)	2.8%	(1.7%, 4.5%)
Lancaster County	51103	6.7%	(3.3%, 44.1%)	14.9%	(8.3%, 25.5%)
Mathews County	51115	0.0%	(0.0%, 24.1%)	4.0%	(1.9%, 8.0%)
Middlesex County	51119	9.9%	(2.5%, 32.0%)	6.4%	(4.2%, 9.8%)
Northampton County	51131	9.0%	(2.3%, 29.1%)	4.2%	(2.5%, 6.8%)
Northumberland County	51133	18.2%	(4.4%, 51.7%)	13.6%	(7.2%, 24.4%)
Richmond County	51159	14.5%	(2.2%, 56.5%)	11.8%	(7.8%, 17.5%)
Southampton County	51175	0.0%	(0.0%, 31.1%)	2.8%	(1.7%, 4.4%)
Westmoreland County	51193	2.5%	(1.5%, 33.2%)	9.1%	(7.3%, 11.1%)
York County	51199	12.9%	(5.8%, 26.5%)	9.8%	(6.8%, 13.9%)
Chesapeake City	51550	1.7%	(1.2%, 5.5%)	5.4%	(4.4%, 6.7%)
Franklin City	51620	0.5%	(0.4%, 23.1%)	3.8%	(2.2%, 6.6%)
Hampton City	51650	6.9%	(3.6%, 12.6%)	6.0%	(4.5%, 7.9%)
Newport News City	51700	3.9%	(2.4%, 9.5%)	3.2%	(2.3%, 4.5%)
Norfolk City	51710	3.9%	(2.1%, 6.9%)	4.8%	(3.6%, 6.4%)
Poquoson City	51735	5.9%	(1.5%, 66.6%)	4.6%	(2.5%, 8.3%)
Portsmouth City	51740	4.2%	(1.8%, 9.4%)	6.4%	(4.8%, 8.5%)
Suffolk City	51800	6.0%	(3.3%, 14.7%)	5.7%	(4.6%, 7.1%)
Virginia Beach City	51810	3.4%	(2.6%, 5.9%)	4.6%	(3.5%, 5.9%)
Williamsburg City	51830	0.0%	(0.0%, 64.5%)	1.7%	(0.7%, 3.8%)

Graphical representation

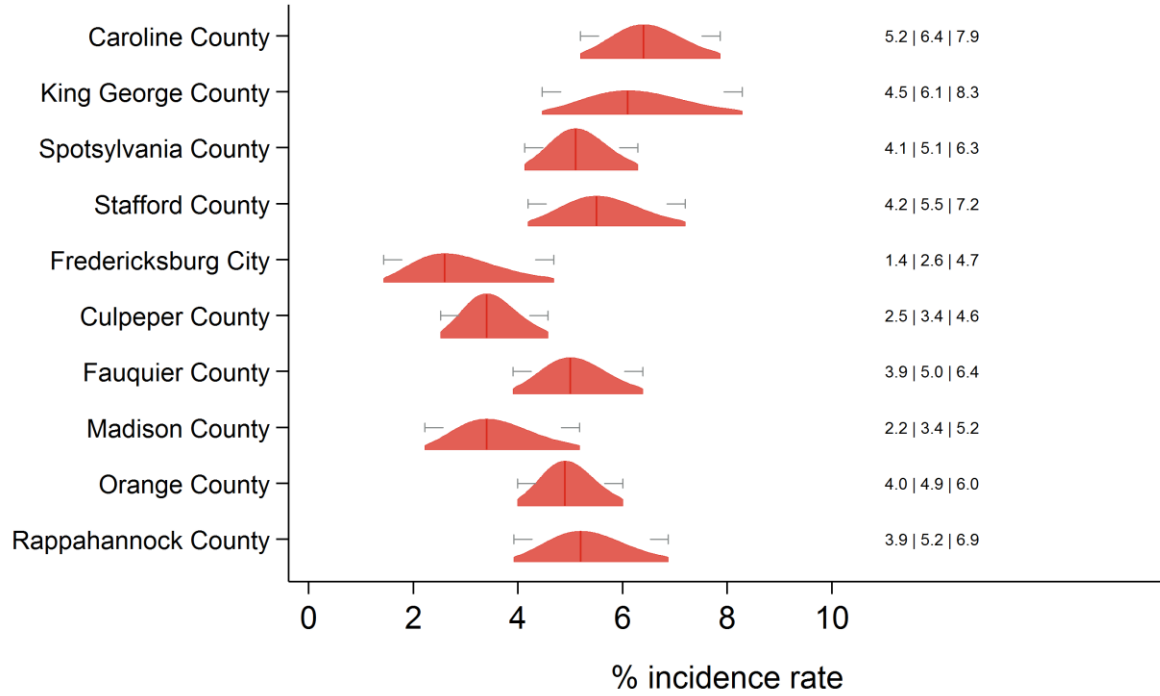
## Diagnosed with coronary heart disease or angina Central Shenandoah and Lord Fairfax HDs



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

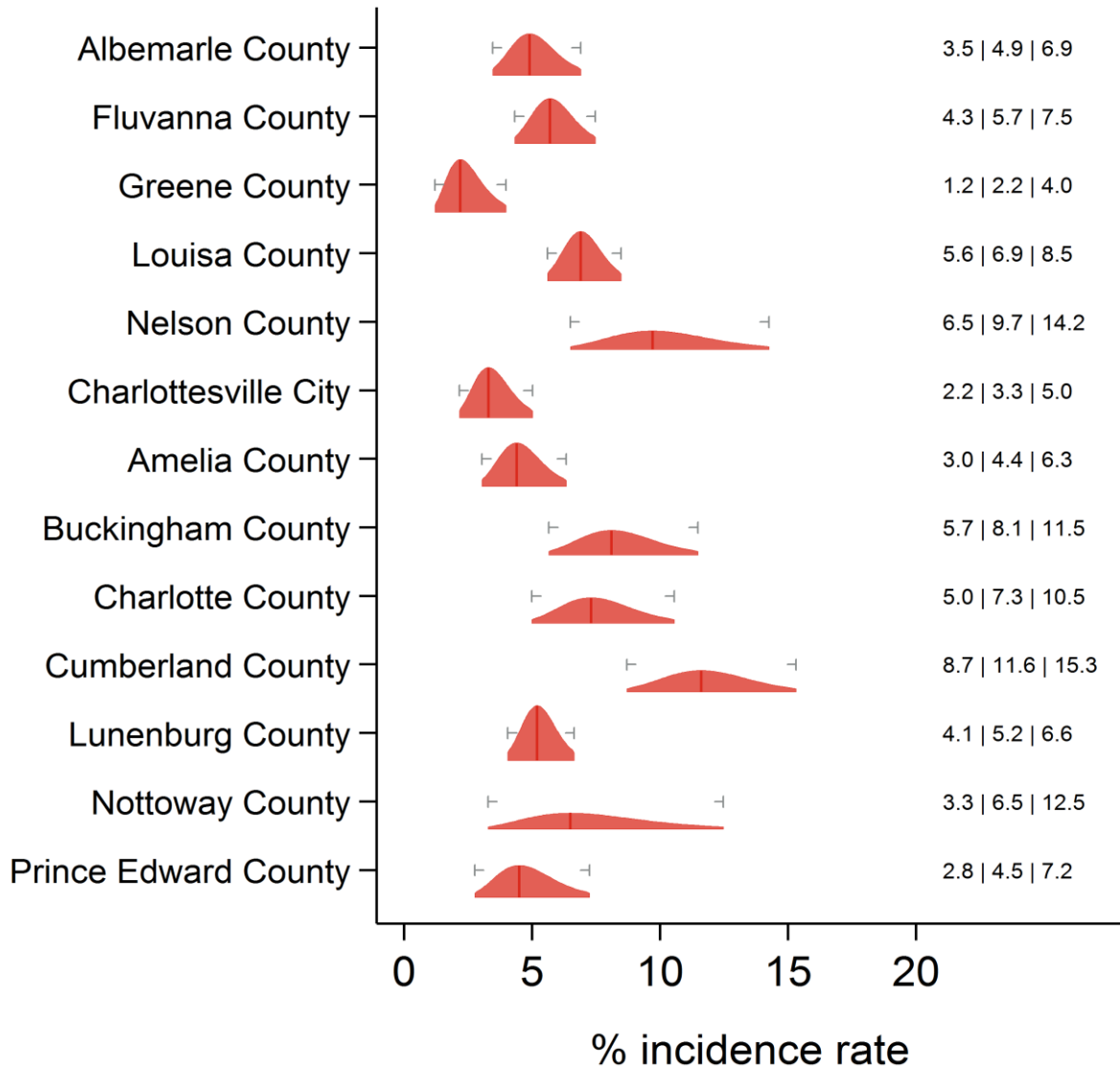


## Diagnosed with coronary heart disease or angina Rappahannock/Rapidan and Rappahannock HDs



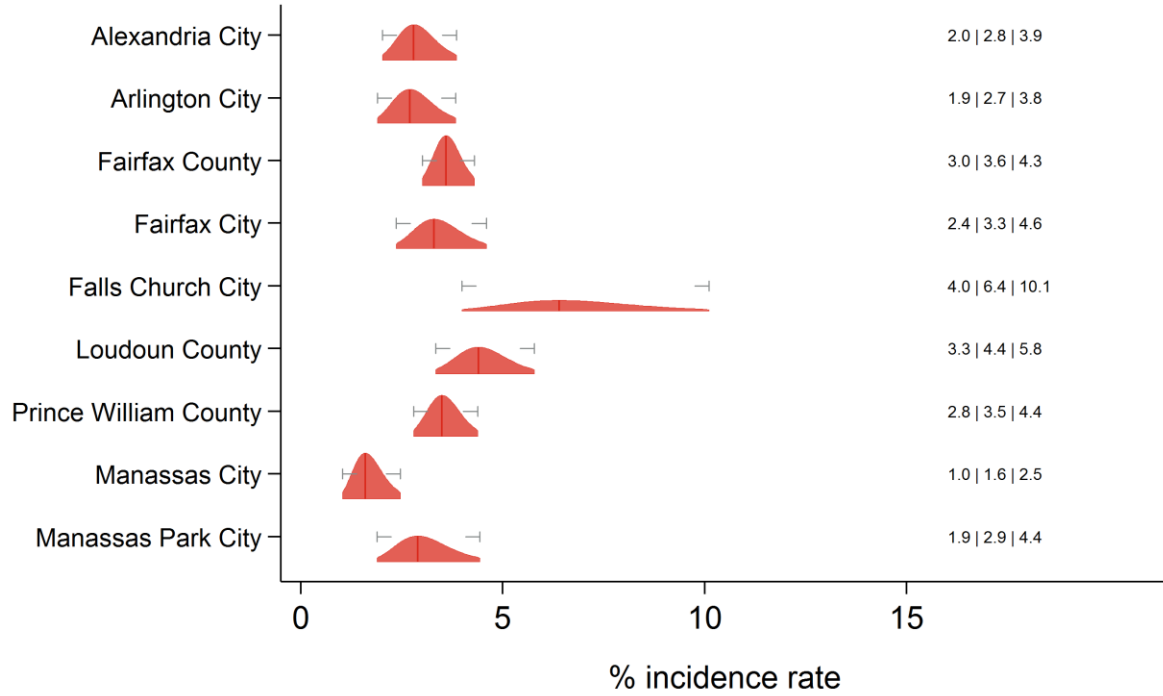
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Thomas Jefferson and Piedmont HDs



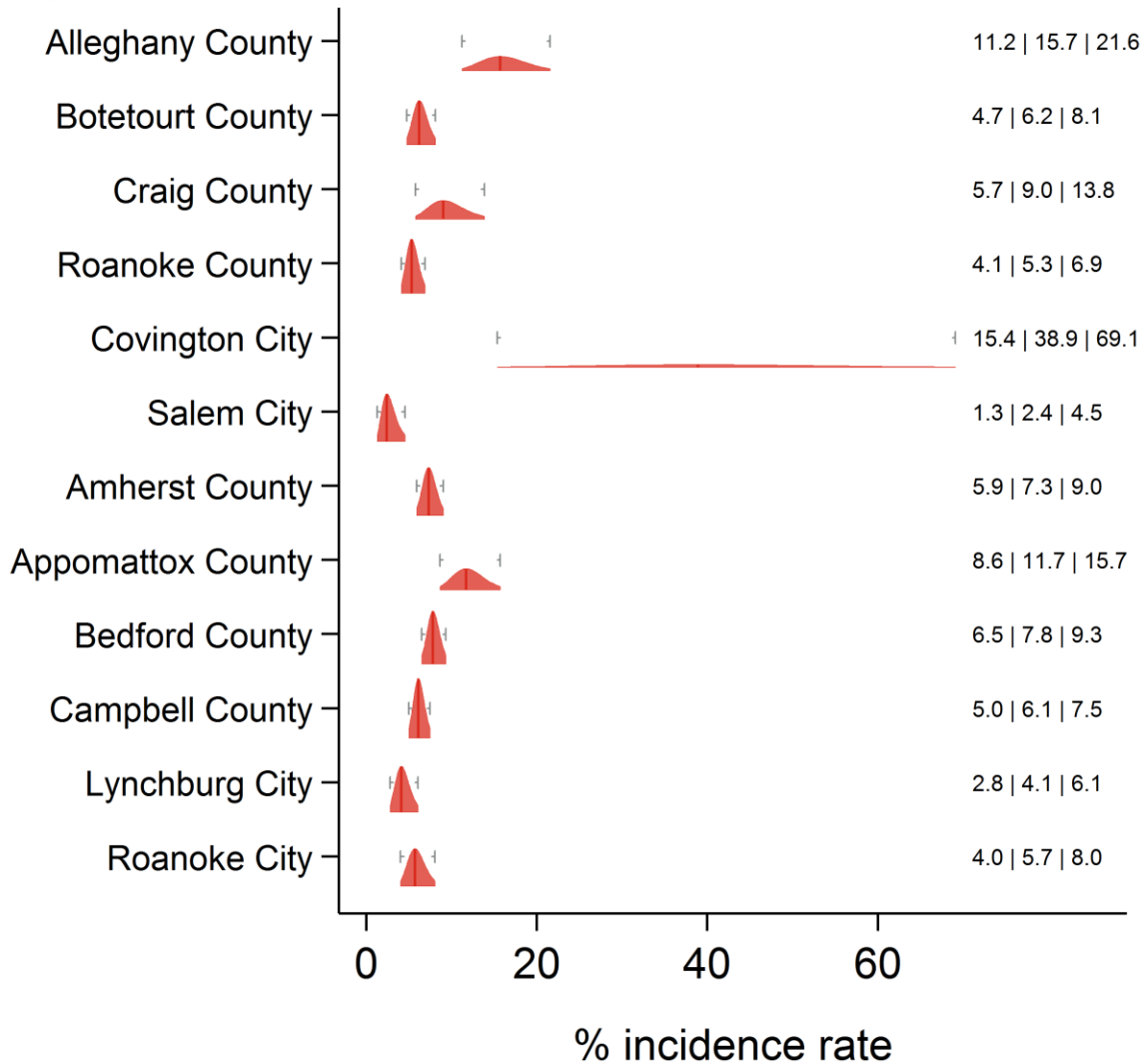
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Alexandria, Fairfax, Arlington, Loudon, Prince William HDs



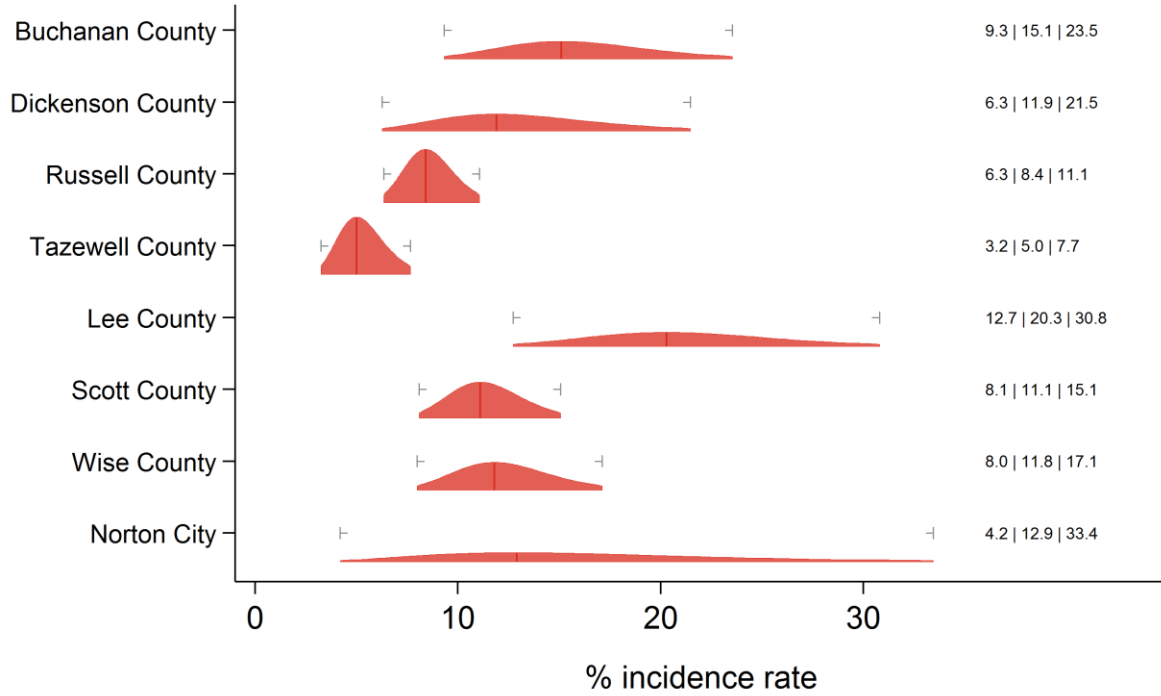
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Alleghany, Roanoke and Central Virginia HDs



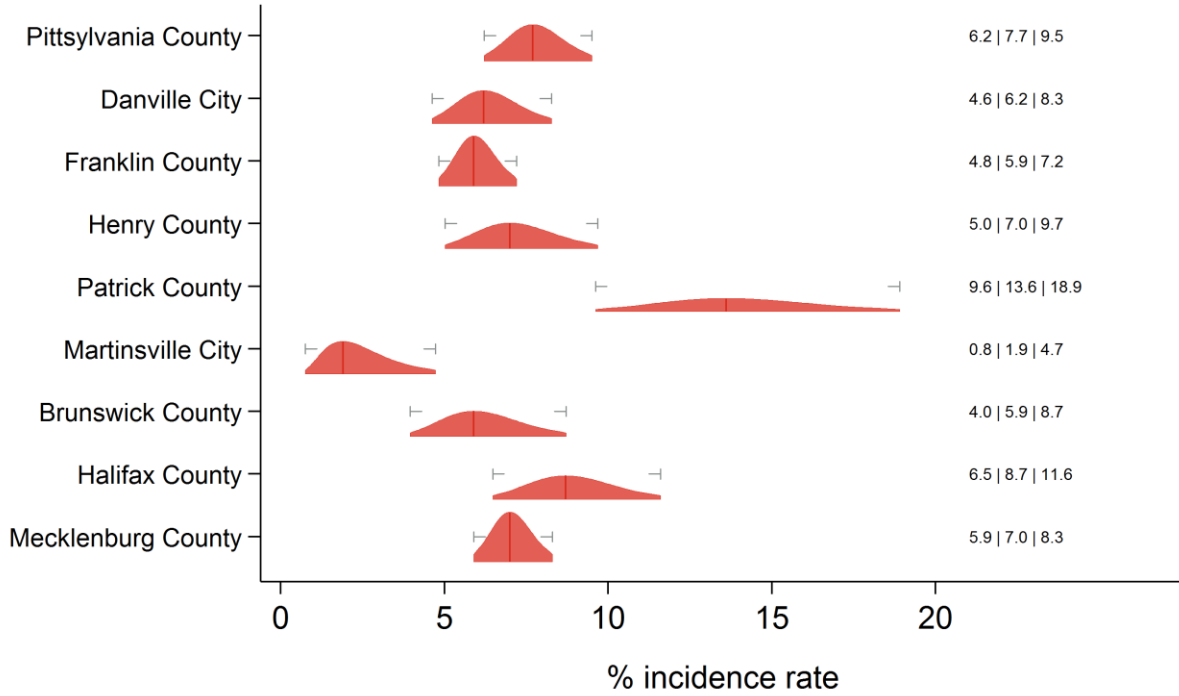
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Cumberland Plateau and Lenowisco HDs



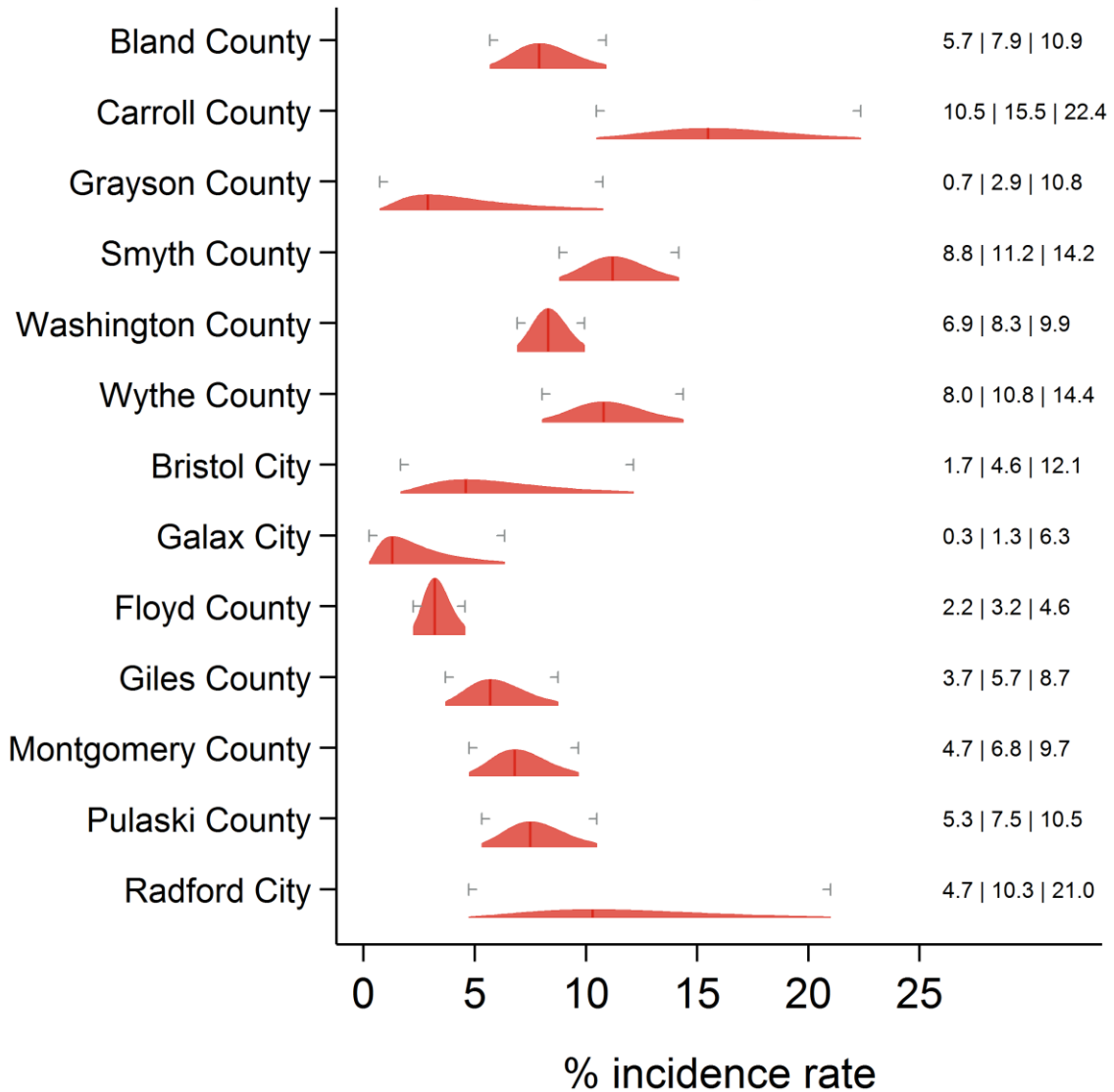
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Pittsylvania/Danville, Southside and West Piedmont HDs



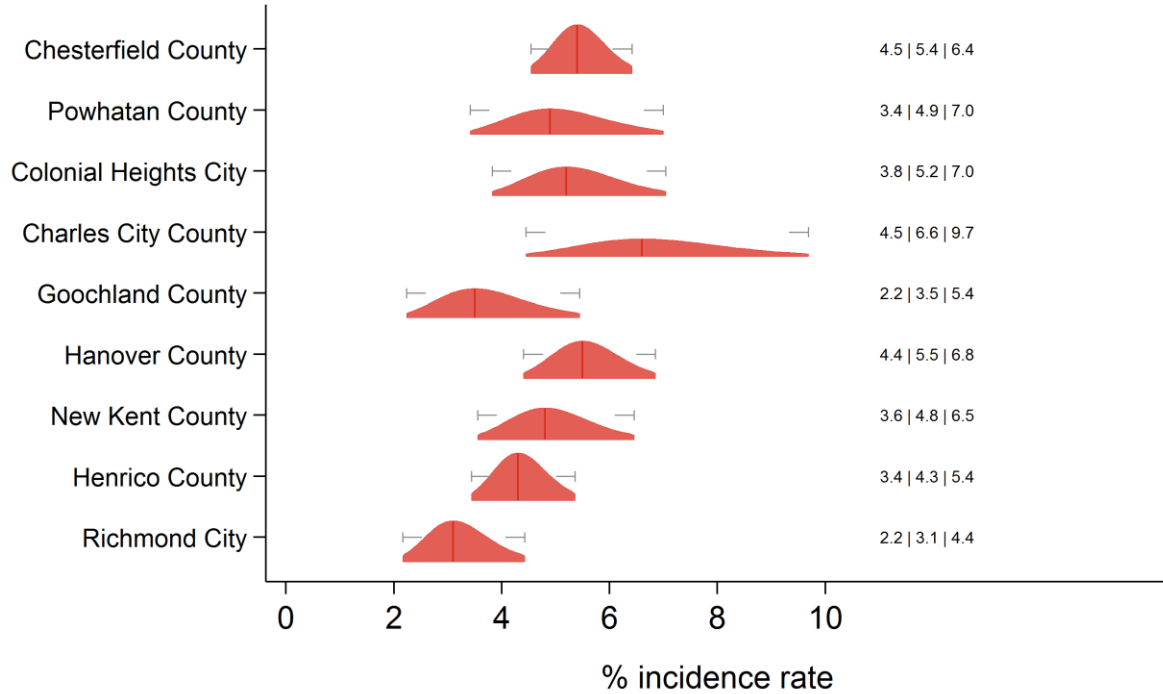
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina New River and Mount Rogers HDs



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

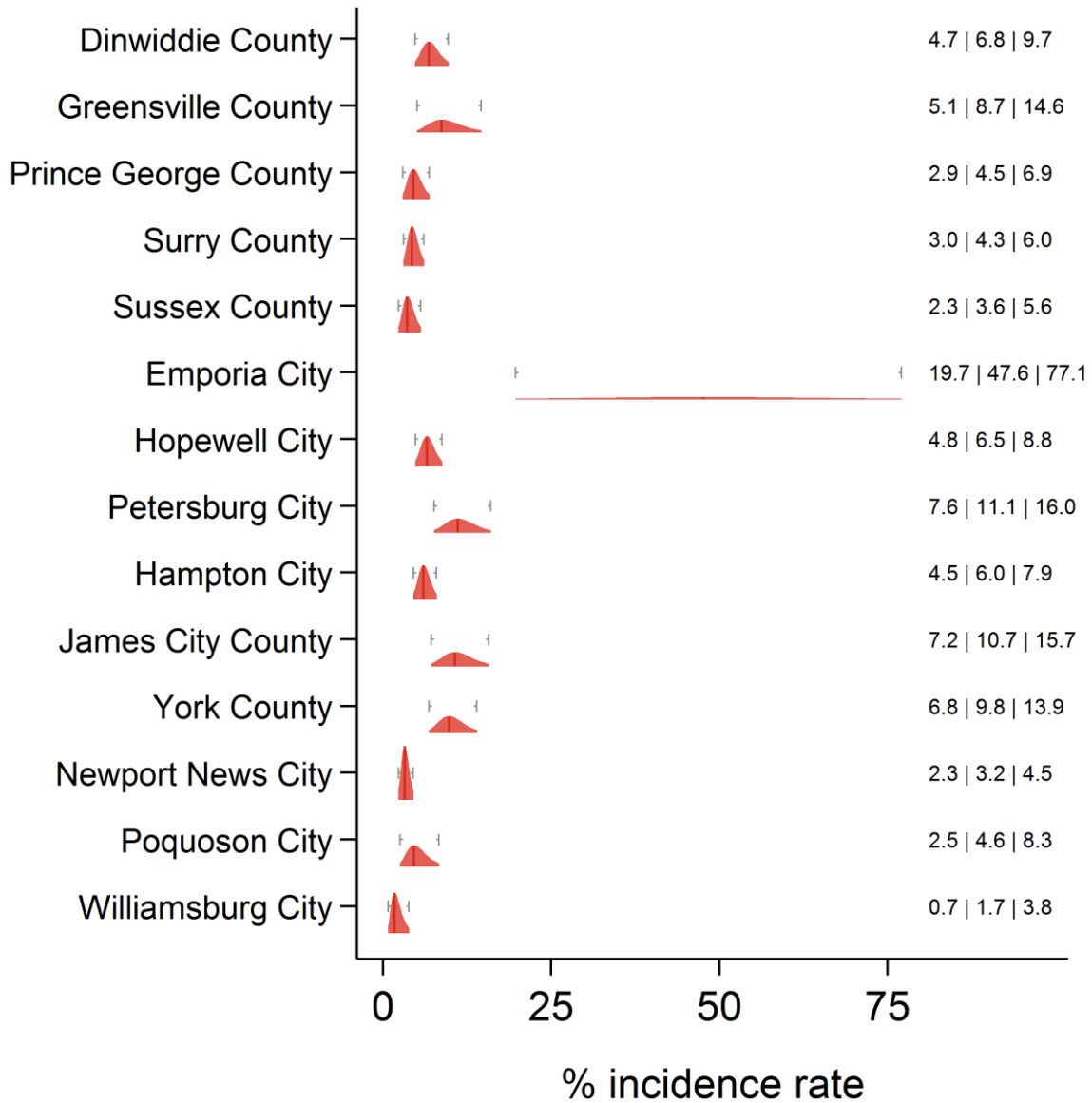
## Diagnosed with coronary heart disease or angina Chesterfield, Chickahominy, Henrico and Richmond HDs



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

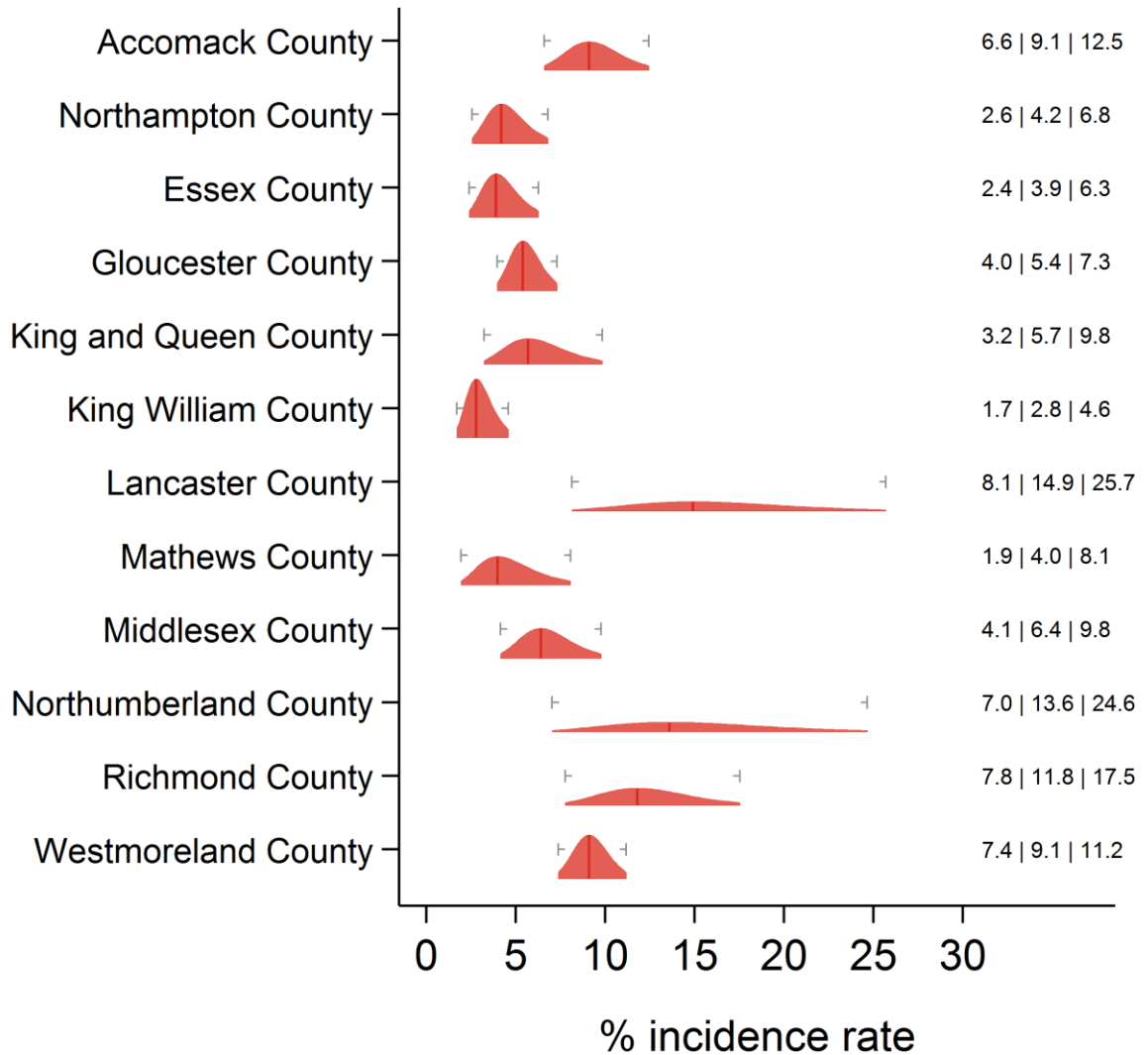


## Diagnosed with coronary heart disease or angina Crater, Peninsula and Hampton HDs



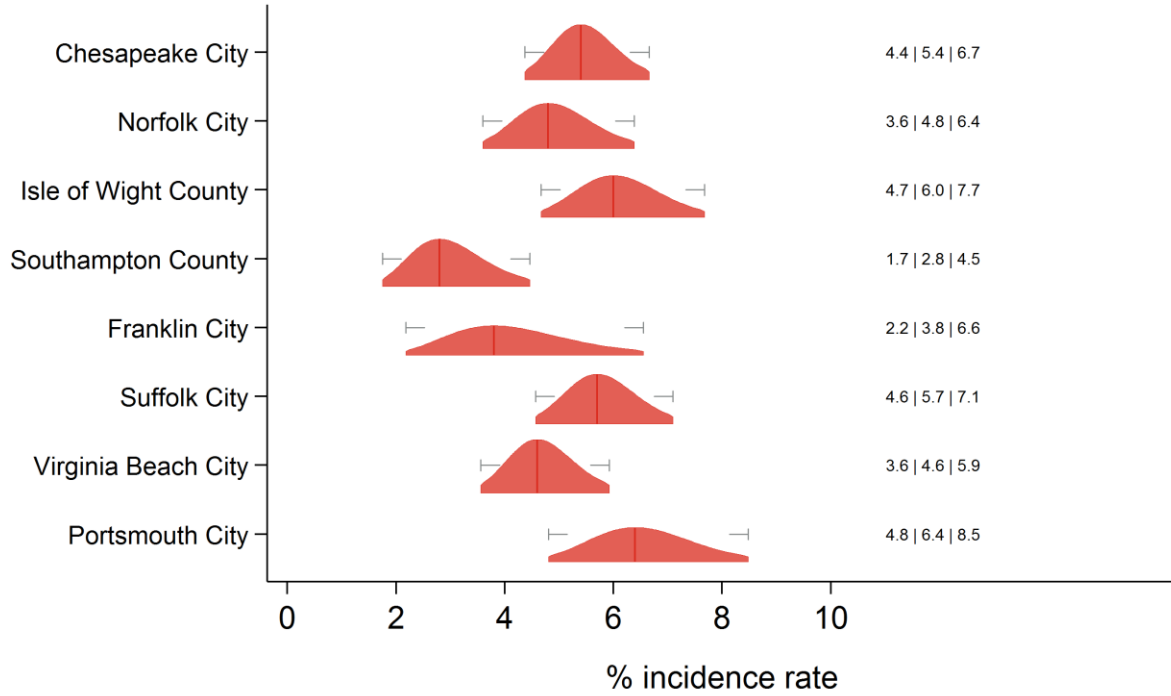
Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB  
 Gray markers: 95% confidence interval

## Diagnosed with coronary heart disease or angina Eastern Shore and Three Rivers HDs



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

## Diagnosed with coronary heart disease or angina 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

## Additional diagnostics

Direct estimate is inside the 95% SAE Wilson CI: 38 areas.

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

SAE estimate is inside the 95% direct Wilson CI: 131 areas.

SAE estimate is outside the 95% direct Wilson CI: 2 areas.

SAE Wilson 95% CI is fully inside the 95% direct Wilson CI: 124 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 9 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: 95 areas.

SAE standard error is greater than the (nonzero) direct standard error: 7 areas.

Direct standard error is zero: 31 areas.

Proportion of SAE variance due to ACS sampling error: min = 0.00%; med = 0.85%; max = 4.25%.

Proportion of SAE variance due to sampling error in regression coefficient estimates: min = 18.85%; med = 96.51%; max = 99.29%.

Proportion of SAE variance due to model selection: min = 0.10%; med = 2.08%; max = 81.15%.

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