



### Indicator 33: Fruit and Vegetable Consumption – FV 5+ times a day

Internal variable name: outc33\_fvday

Definition: Combined recode of FRUIT2, FRUITJU2, FVGREEN1, VEGETAB2; potatoes are excluded

#### Predictive models

	Mixed,	Logit, no	Mixed with
	demos only	area effects	area
			covariates
	b/se	b/se	b/se
Outcome 33: Fruit and Vegetable Consumption FV 5+			
times a day			
NH Black vs. NH White	0.1988	0.1906	0.1906
	(0.1150)	(0.1310)	(0.1178)
NH Asian vs. NH White	0.1734	0.0973	0.0973
	(0.1683)	(0.2423)	(0.1544)
NH Other vs. NH White	0.1520	0.1435	0.1435
	(0.2056)	(0.1919)	(0.2090)
Hispanic vs. NH White	0.1085	0.1325	0.1325
	(0.2069)	(0.2053)	(0.2179)
Female	0.3898***	0.4001***	0.4001***
	(0.1045)	(0.0929)	(0.1048)
Age 18-34 vs. 65+	0.2258	0.2204	0.2204
	(0.1197)	(0.1218)	(0.1214)
Age 35-44 vs. 65+	0.3577**	0.3480**	0.3480**
	(0.1323)	(0.1322)	(0.1304)
Age 45-54 vs. 65+	0.0204	0.0280	0.0280
	(0.1171)	(0.1225)	(0.1191)
Age 55-64 vs. 65+	0.2741**	0.2704*	0.2704**
	(0.0928)	(0.1127)	(0.0930)
VA BRFSS 2014 SAE outc11_skin_cancer		11.0416***	11.0416***
		(3.2094)	(2.5164)
VA BRFSS 2014 SAE outc9_stroke		-2.7e+02***	-2.7e+02***
		(81.1496)	(64.7042)
VA BRFSS 2014 SAE outc26_shingles_vacc		2.3368*	2.3368**
		(0.9375)	(0.7321)
% NH minority among adults 18 to 64		0.0137**	0.0137***
		(0.0045)	(0.0041)
o.VA BRFSS 2014 SAE outc9_stroke		0.0000	
		(.)	
Historic SAE: current smoking rate		-0.1095***	-0.1095***
		(0.0310)	(0.0240)
c.VA14SAE_outc9_stroke#c.papsmear		3.0174**	3.0174***
		(0.9393)	(0.7372)





VA BRFSS 2014 SAE outc8_heart_disease		-18.9872**	-18.9872***
		(5.8091)	(3.9443)
c.VA14SAE_outc8_heart_disease#c.VA14SAE_outc9_stroke		388.0006*	388.0007**
		(176.5076)	(139.6002)
Intercept	-2.2142***	6.1783*	6.1783**
	(0.0920)	(2.6020)	(2.0267)
Area effect variance			
	0.0175		0.0000
	(0.0140)		(0.0000)

Number of alternative models used to estimate model error = 12.





#### Results

County name	County	Direct	Direct 95% CI	SAE composite	SAE CI
	FIPS	estimate			
Augusta County	51015	9.6%	(4.4%, 19.9%)	12.3%	(10.1%, 15.0%)
Bath County	51017	11.6%	(2.0%, 54.4%)	6.1%	(3.5%, 10.5%)
Caroline County	51033	26.2%	(9.5%, 54.6%)	19.2%	(16.3%, 22.4%)
Clarke County	51043	11.8%	(5.1%, 40.5%)	16.4%	(13.1%, 20.4%)
Culpeper County	51047	17.6%	(6.7%, 39.0%)	15.0%	(13.5%, 16.6%)
Fauquier County	51061	5.6%	(3.1%, 18.4%)	14.7%	(11.6%, 18.3%)
Frederick County	51069	29.2%	(16.6%, 46.0%)	13.8%	(11.8%, 16.1%)
Highland County	51091	21.5%	(2.6%, 73.5%)	35.5%	(24.4%, 48.3%)
King George County	51099	3.0%	(1.4%, 29.3%)	16.8%	(14.6%, 19.3%)
Madison County	51113	21.4%	(6.0%, 53.7%)	17.9%	(14.8%, 21.5%)
Orange County	51137	13.9%	(5.5%, 31.0%)	14.2%	(12.0%, 16.7%)
Page County	51139	13.2%	(4.0%, 35.5%)	11.3%	(9.2%, 13.7%)
Rappahannock County	51157	28.8%	(8.9%, 62.8%)	13.3%	(10.7%, 16.4%)
Rockbridge County	51163	24.5%	(11.8%, 43.9%)	12.0%	(10.2%, 14.0%)
Rockingham County	51165	8.1%	(5.1%, 16.7%)	11.0%	(8.9%, 13.5%)
Shenandoah County	51171	15.8%	(5.5%, 37.6%)	13.8%	(11.4%, 16.6%)
Spotsylvania County	51177	12.0%	(6.7%, 20.7%)	11.1%	(9.2%, 13.2%)
Stafford County	51179	12.7%	(7.3%, 21.2%)	13.6%	(11.8%, 15.7%)
Warren County	51187	13.1%	(4.3%, 33.7%)	14.4%	(12.5%, 16.5%)
Buena Vista City	51530	0.0%	(0.0%, 45.0%)	14.9%	(12.6%, 17.5%)
Fredericksburg City	51630	21.1%	(6.6%, 50.4%)	18.6%	(15.5%, 22.2%)
Harrisonburg City	51660	12.9%	(1.7%, 55.6%)	10.7%	(8.5%, 13.4%)
Lexington City	51678	0.0%	(0.0%, 96.3%)	3.8%	(1.8%, 7.7%)
Staunton City	51790	16.3%	(2.1%, 63.4%)	12.8%	(10.5%, 15.5%)
Waynesboro City	51820	32.5%	(8.8%, 70.6%)	12.4%	(10.9%, 14.0%)
Winchester City	51840	48.2%	(8.5%, 90.3%)	13.0%	(10.8%, 15.5%)





County name	County	Direct	Direct 95% CI	SAE composite	SAE CI
	FIPS	estimate			
Albemarle County	51003	20.1%	(12.7%, 30.4%)	19.9%	(17.9%, 22.1%)
Alleghany County	51005	9.8%	(3.2%, 26.5%)	6.8%	(5.1%, 9.1%)
Amherst County	51009	19.4%	(4.4%, 55.5%)	15.1%	(12.6%, 17.9%)
Appomattox County	51011	25.3%	(9.6%, 51.9%)	21.0%	(15.3%, 28.0%)
Arlington City	51013	22.7%	(15.1%, 32.6%)	21.5%	(18.6%, 24.8%)
Bedford County	51019	6.2%	(3.9%, 13.0%)	12.0%	(10.2%, 14.1%)
Botetourt County	51023	25.3%	(12.0%, 45.7%)	16.2%	(12.8%, 20.3%)
Campbell County	51031	13.0%	(6.8%, 23.5%)	11.0%	(9.3%, 13.0%)
Craig County	51045	13.8%	(2.9%, 74.1%)	26.3%	(19.8%, 34.1%)
Fairfax County	51059	18.7%	(15.6%, 22.4%)	16.9%	(15.2%, 18.8%)
Fluvanna County	51065	14.9%	(5.1%, 36.7%)	16.0%	(13.3%, 19.1%)
Greene County	51079	0.0%	(0.0%, 37.1%)	14.3%	(12.3%, 16.5%)
Loudoun County	51107	16.8%	(11.3%, 24.3%)	17.5%	(15.2%, 20.1%)
Louisa County	51109	17.2%	(6.6%, 38.1%)	16.6%	(14.5%, 18.9%)
Nelson County	51125	13.1%	(5.7%, 44.2%)	20.4%	(16.5%, 24.9%)
Prince William County	51153	14.9%	(10.2%, 21.2%)	13.4%	(11.6%, 15.3%)
Roanoke County	51161	12.8%	(7.6%, 20.6%)	14.4%	(11.5%, 17.9%)
Alexandria City	51510	19.1%	(12.4%, 28.3%)	18.5%	(16.2%, 21.1%)
Charlottesville City	51540	8.5%	(4.7%, 28.5%)	15.6%	(12.4%, 19.5%)
Covington City	51580	0.0%	(0.0%, 96.4%)	9.5%	(6.7%, 13.5%)
Fairfax City	51600	14.1%	(6.5%, 28.0%)	12.1%	(10.0%, 14.5%)
Falls Church City	51610	24.4%	(9.6%, 49.6%)	29.2%	(24.4%, 34.5%)
Lynchburg City	51680	17.9%	(9.7%, 30.7%)	19.9%	(17.7%, 22.3%)
Manassas City	51683	1.9%	(1.1%, 36.6%)	8.7%	(6.6%, 11.4%)
Manassas Park City	51685	0.0%	(0.0%, 76.5%)	0.3%	(0.0%, 7.1%)
Salem City	51775	2.6%	(1.1%, 46.6%)	10.1%	(8.3%, 12.1%)





County name	County	Direct	Direct 95% CI	SAE composite	SAE CI
	FIPS	estimate			
Bland County	51021	7.4%	(1.5%, 38.5%)	9.8%	(7.5%, 12.8%)
Buchanan County	51027	2.2%	(1.1%, 22.0%)	4.9%	(2.4%, 10.1%)
Carroll County	51035	22.5%	(8.2%, 48.7%)	13.0%	(9.7%, 17.2%)
Dickenson County	51051	9.7%	(2.1%, 35.1%)	8.6%	(5.0%, 14.6%)
Floyd County	51063	15.8%	(5.9%, 35.8%)	17.3%	(13.2%, 22.2%)
Franklin County	51067	3.4%	(2.0%, 19.4%)	11.4%	(9.8%, 13.2%)
Giles County	51071	19.2%	(8.4%, 37.9%)	14.2%	(11.3%, 17.7%)
Grayson County	51077	8.8%	(1.9%, 32.2%)	18.5%	(13.1%, 25.4%)
Henry County	51089	7.5%	(2.8%, 18.3%)	6.5%	(4.5%, 9.2%)
Lee County	51105	0.0%	(-0.0%, 28.6%)	6.5%	(4.9%, 8.8%)
Montgomery County	51121	13.7%	(6.7%, 26.1%)	15.5%	(13.8%, 17.5%)
Patrick County	51141	6.7%	(3.1%, 38.5%)	11.0%	(8.2%, 14.7%)
Pittsylvania County	51143	12.0%	(6.2%, 21.9%)	12.1%	(10.9%, 13.5%)
Pulaski County	51155	4.5%	(2.1%, 21.8%)	5.9%	(4.2%, 8.3%)
Russell County	51167	14.1%	(4.0%, 39.5%)	8.8%	(6.7%, 11.4%)
Scott County	51169	6.1%	(2.9%, 25.4%)	7.4%	(5.4%, 10.0%)
Smyth County	51173	2.5%	(1.4%, 31.6%)	10.7%	(8.5%, 13.4%)
Tazewell County	51185	20.4%	(8.1%, 42.5%)	7.9%	(5.7%, 10.9%)
Washington County	51191	13.1%	(5.2%, 29.0%)	12.6%	(10.4%, 15.0%)
Wise County	51195	13.0%	(5.6%, 27.5%)	11.2%	(8.5%, 14.6%)
Wythe County	51197	7.5%	(3.4%, 26.0%)	8.2%	(5.5%, 12.1%)
Bristol City	51520	76.3%	(14.0%, 97.2%)	20.4%	(14.6%, 27.8%)
Danville City	51590	22.4%	(7.8%, 49.6%)	10.3%	(6.1%, 16.9%)
Galax City	51640	43.9%	(2.5%, 96.0%)	9.4%	(5.5%, 15.6%)
Martinsville City	51690	3.7%	(1.4%, 53.6%)	2.8%	(0.9%, 8.6%)
Norton City	51720	28.6%	(3.1%, 83.5%)	5.6%	(2.1%, 13.9%)
Radford City	51750	37.4%	(8.4%, 79.6%)	17.3%	(13.1%, 22.5%)
Roanoke City	51770	6.1%	(2.4%, 14.7%)	10.4%	(8.6%, 12.5%)





County name	County FIPS	Direct estimate	Direct 95% CI	SAE composite	SAE CI
Amelia County	51007	8.1%	(1.5%, 34.2%)	8.5%	(6.8%, 10.5%)
Brunswick County	51025	3.6%	(1.4%, 27.6%)	5.0%	(2.3%, 10.6%)
Buckingham County	51029	11.6%	(3.7%, 30.6%)	15.9%	(13.6%, 18.5%)
Charles City County	51036	0.0%	(0.0%, 58.8%)	17.5%	(13.8%, 21.9%)
Charlotte County	51037	11.4%	(3.3%, 32.3%)	12.2%	(9.9%, 15.1%)
Chesterfield County	51041	13.8%	(8.6%, 21.3%)	14.0%	(12.4%, 15.8%)
Cumberland County	51049	18.2%	(3.2%, 59.7%)	12.2%	(10.8%, 13.6%)
Dinwiddie County	51053	8.1%	(1.6%, 32.0%)	10.1%	(8.4%, 12.2%)
Goochland County	51075	11.4%	(3.5%, 31.4%)	13.7%	(11.0%, 17.0%)
Greensville County	51081	26.8%	(5.3%, 70.4%)	12.2%	(9.6%, 15.4%)
Halifax County	51083	1.7%	(1.1%, 13.3%)	9.8%	(7.5%, 12.6%)
Hanover County	51085	12.8%	(6.9%, 22.8%)	14.8%	(12.8%, 17.0%)
Henrico County	51087	14.8%	(9.2%, 23.0%)	17.2%	(15.0%, 19.6%)
Lunenburg County	51111	7.0%	(3.0%, 41.0%)	11.8%	(9.6%, 14.4%)
Mecklenburg County	51117	16.8%	(7.6%, 33.2%)	13.9%	(11.7%, 16.4%)
New Kent County	51127	14.7%	(3.5%, 45.4%)	7.6%	(5.8%, 10.0%)
Nottoway County	51135	3.6%	(1.9%, 38.7%)	17.2%	(13.9%, 21.0%)
Powhatan County	51145	30.7%	(10.6%, 62.5%)	12.5%	(9.8%, 15.9%)
Prince Edward County	51147	27.4%	(12.7%, 49.5%)	21.2%	(18.3%, 24.3%)
Prince George County	51149	11.2%	(4.4%, 25.6%)	11.1%	(9.7%, 12.6%)
Surry County	51181	0.0%	(0.0%, 35.6%)	6.1%	(3.1%, 11.6%)
Sussex County	51183	16.3%	(4.4%, 45.3%)	11.0%	(8.5%, 14.0%)
Colonial Heights City	51570	4.6%	(2.2%, 24.8%)	9.7%	(7.2%, 13.0%)
Emporia City	51595	62.9%	(3.5%, 98.6%)	23.0%	(16.5%, 31.2%)
Hopewell City	51670	17.6%	(6.2%, 40.6%)	14.2%	(9.2%, 21.2%)
Petersburg City	51730	23.7%	(10.9%, 44.1%)	17.8%	(13.3%, 23.5%)
Richmond City	51760	14.3%	(8.4%, 23.3%)	17.0%	(14.3%, 20.2%)





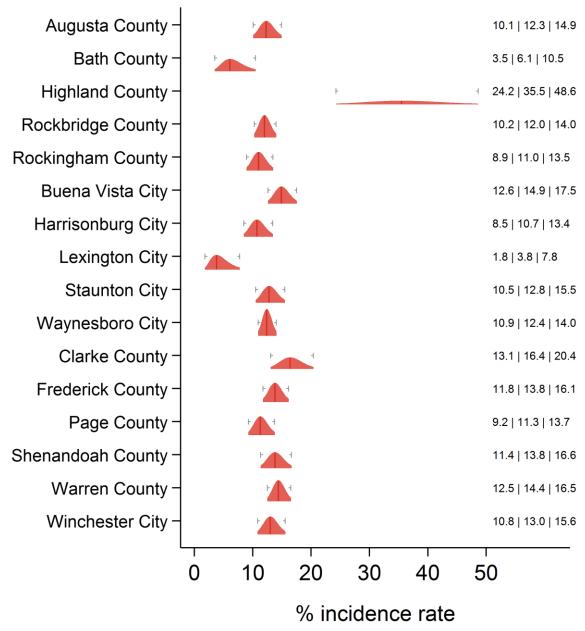
County name	County	Direct	Direct 95% CI	SAE composite	SAE CI
	FIPS	estimate		-	
Accomack County	51001	25.3%	(11.8%, 46.1%)	15.1%	(11.4%, 19.8%)
Essex County	51057	15.4%	(5.1%, 38.4%)	18.8%	(14.8%, 23.6%)
Gloucester County	51073	17.4%	(8.5%, 32.2%)	13.0%	(11.3%, 14.9%)
Isle of Wight County	51093	12.4%	(3.5%, 35.9%)	11.9%	(10.1%, 14.0%)
James City County	51095	19.9%	(11.7%, 31.9%)	17.3%	(14.4%, 20.6%)
King and Queen County	51097	8.7%	(1.9%, 45.5%)	8.6%	(6.8%, 10.8%)
King William County	51101	7.1%	(1.1%, 34.5%)	9.5%	(7.8%, 11.5%)
Lancaster County	51103	6.7%	(3.2%, 46.5%)	5.1%	(2.0%, 12.8%)
Mathews County	51115	17.2%	(5.7%, 41.9%)	10.8%	(8.7%, 13.3%)
Middlesex County	51119	25.6%	(9.6%, 52.6%)	15.6%	(13.3%, 18.3%)
Northampton County	51131	12.9%	(5.0%, 29.3%)	11.9%	(9.2%, 15.4%)
Northumberland County	51133	5.8%	(3.0%, 27.3%)	15.0%	(9.6%, 22.7%)
Richmond County	51159	9.6%	(3.2%, 25.3%)	10.9%	(9.3%, 12.8%)
Southampton County	51175	10.0%	(3.7%, 43.9%)	11.8%	(10.1%, 13.8%)
Westmoreland County	51193	4.2%	(2.0%, 48.2%)	13.2%	(10.9%, 15.9%)
York County	51199	16.2%	(7.1%, 32.9%)	15.3%	(12.5%, 18.6%)
Chesapeake City	51550	12.9%	(7.6%, 20.9%)	15.7%	(14.3%, 17.3%)
Franklin City	51620	4.1%	(2.1%, 29.3%)	12.4%	(9.6%, 15.9%)
Hampton City	51650	13.5%	(8.5%, 21.0%)	14.8%	(12.5%, 17.3%)
Newport News City	51700	21.8%	(12.5%, 35.4%)	15.1%	(12.8%, 17.8%)
Norfolk City	51710	10.7%	(6.9%, 16.1%)	15.6%	(13.5%, 18.0%)
Poquoson City	51735	22.6%	(3.5%, 79.0%)	14.5%	(11.6%, 18.0%)
Portsmouth City	51740	18.5%	(10.0%, 31.8%)	13.8%	(11.2%, 16.9%)
Suffolk City	51800	14.0%	(7.4%, 25.0%)	15.5%	(13.6%, 17.7%)
Virginia Beach City	51810	16.9%	(11.7%, 23.8%)	16.3%	(14.9%, 17.9%)
Williamsburg City	51830	9.1%	(1.3%, 42.7%)	8.4%	(4.8%, 14.1%)





#### Graphical representation

# 5+ times fruit/veg a day Central Shenandoah and Lord Fairfax HDs

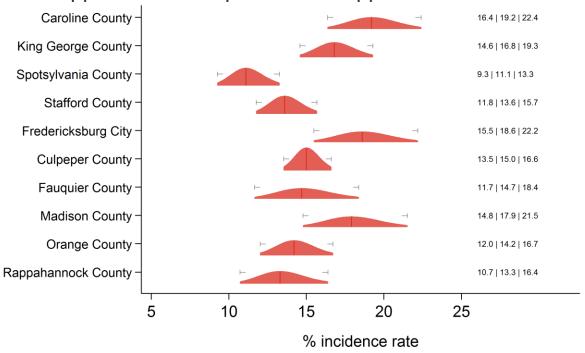


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





5+ times fruit/veg a day Rappahannock/Rapidan and Rappahannock HDs

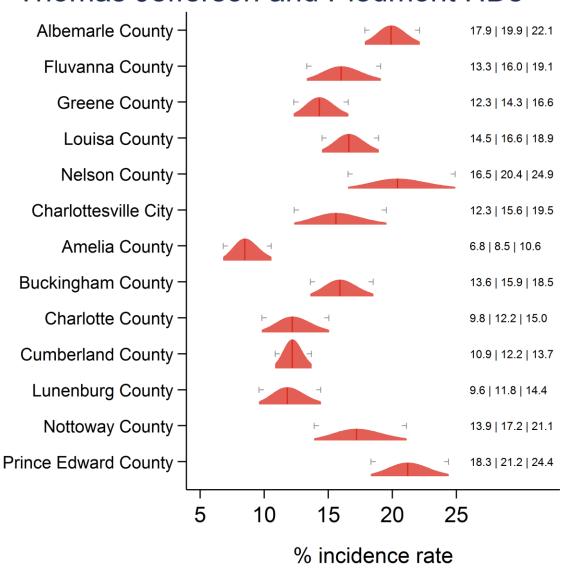


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day Thomas Jefferson and Piedmont HDs

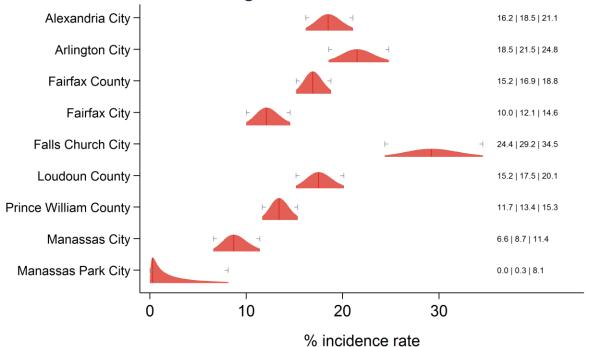


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day Alexandria, Fairfax, Arlington, Loudon, Prince William HDs

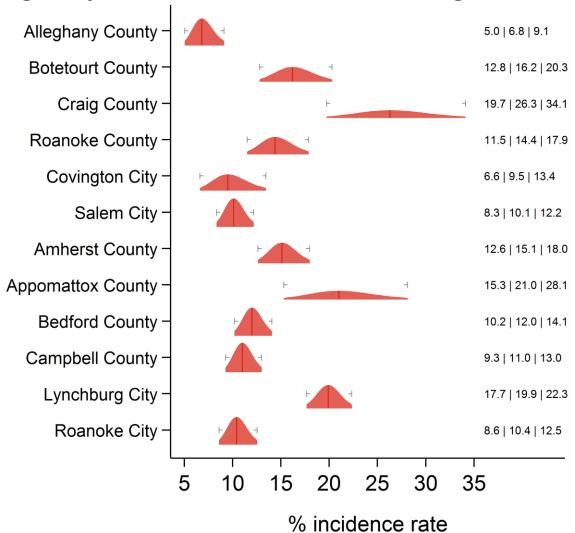


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day Alleghany, Roanoke and Central Virginia HDs

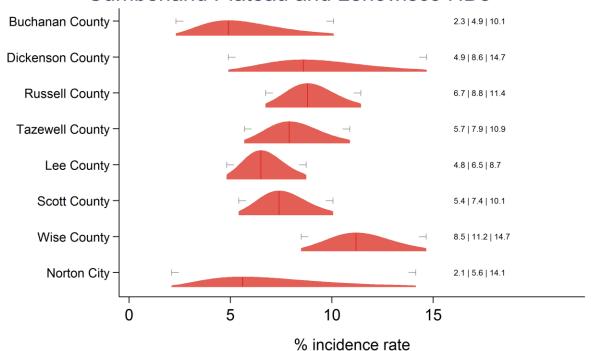


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





### 5+ times fruit/veg a day Cumberland Plateau and Lenowisco HDs

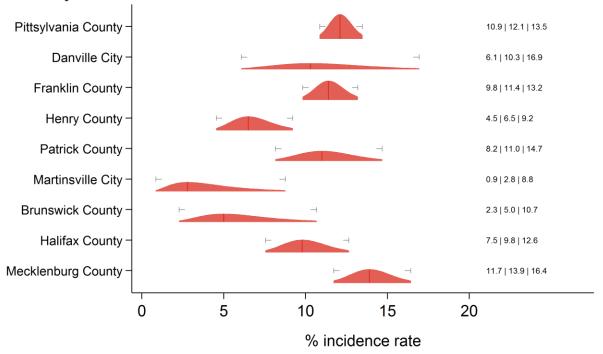


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day Pittsylvania/Danville, Southside and West Piedmont HDs

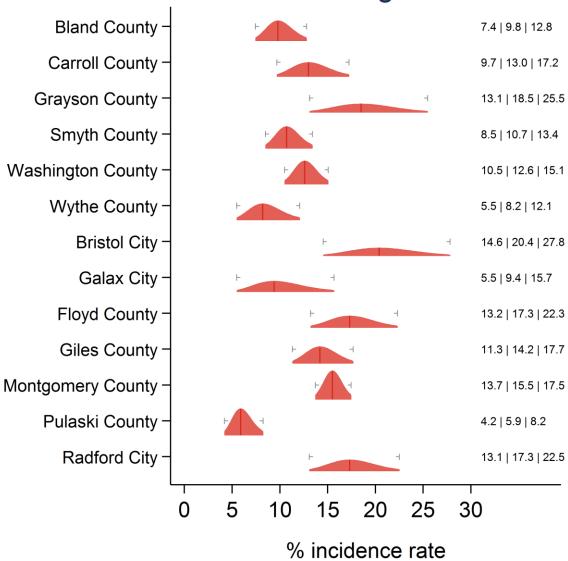


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





## 5+ times fruit/veg a day New River and Mount Rogers HDs

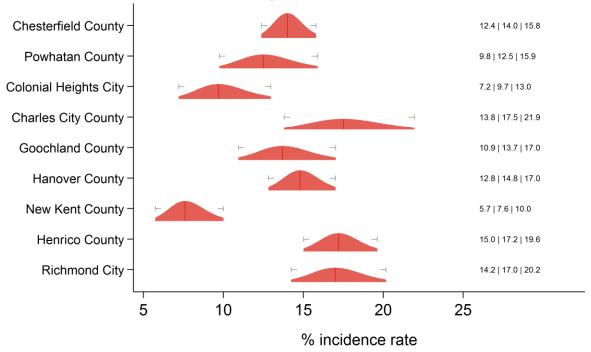


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





### 5+ times fruit/veg a day Chesterfield, Chickahominy, Henrico and Richmond HDs

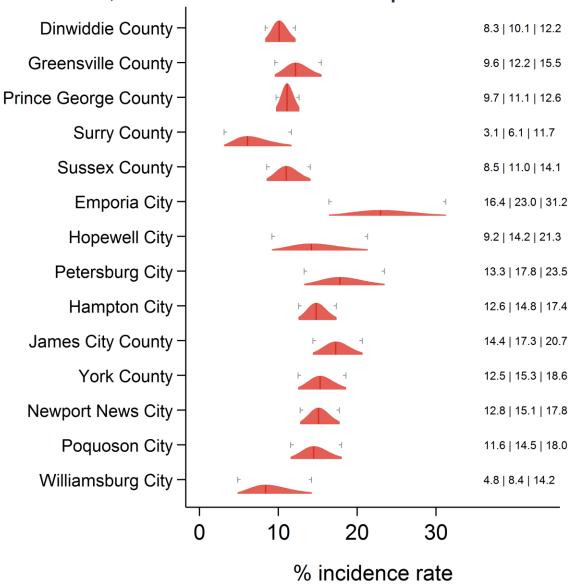


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day Crater, Peninsula and Hampton HDs

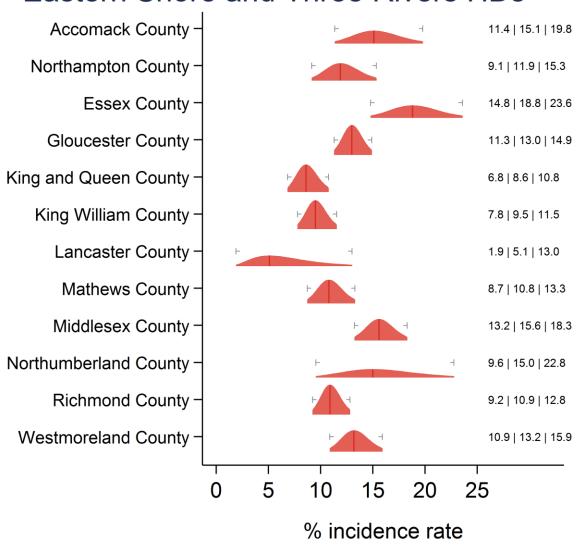


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





## 5+ times fruit/veg a day Eastern Shore and Three Rivers HDs

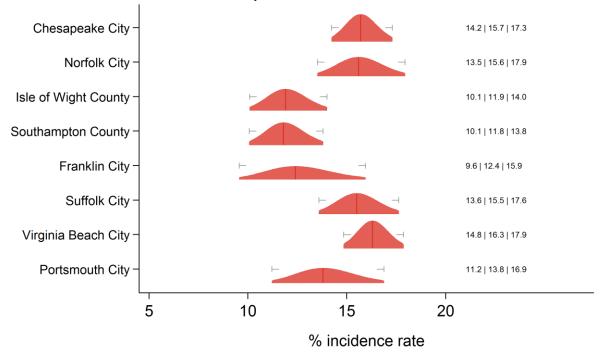


Text at right: 2-sided 95% LCB | Point Estimate | 2-sided 95% UCB Gray markers: 95% confidence interval





# 5+ times fruit/veg a day 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: 53 areas.

Direct estimate is outside the 95% SAE Wilson CI: 80 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: 121 areas.

SAE Wilson 95% CI partially overlaps with the 95% direct Wilson CI: 12 areas.

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

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

SAE standard error is greater that the (nonzero) direct standard error: 1 areas.

Direct standard error is zero: 8 areas.

Proportion of SAE variance due to ACS sampling error: min = 0.01%; med = 2.64%; max = 11.08%.

Proportion of SAE variance due to sampling error in regression coefficient estimates: min = 7.73%; med = 90.46%; max = 98.48%.

Proportion of SAE variance due to model selection: min = 0.55%; med = 5.52%; max = 92.25%.

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