

## **Estimations of Deaths in Virginia Caused by Pandemic Flu by Virginia State Police Divisions**

**NOTE:** THE NUMBERS CONTAINED IN THE FOLLOWING TABLE ARE ESTIMATIONS OF WHAT COULD HAPPEN AND ARE INTENDED SOLEY AS A GUIDE TO HELP LOCALITIES PLAN AND PREPARE.

The attached table is an estimation of the number of deaths that could possibly occur if pandemic flu were to arrive in the Commonwealth of Virginia. These numbers are based on 2004 population data obtained from the Virginia Department of Health Statistics' website (<http://vdhweb/HealthStats/2004Pop.xls>). Population counts and total deaths for 2004 (Columns 2 & 3, respectively) are broken down by Virginia State Police (VSP) Divisions by city or county (Column 1).

The remaining six columns represent the estimated number of deaths that could occur due to pandemic flu during a 24-week period with two waves. The first 3 columns represent three mortality rates: 1) the first rate of 0.6 deaths/1000 people is an average mortality rate based on the estimated, total number of deaths in a "medium level" pandemic as provided by the Virginia Department of Health (Column 4); 2) the second rate of 1.52 deaths/1000 people is based on a worst-case scenario using a 35% attack rate modeled after the 1958 and 1968 pandemics (Column 5)<sup>1</sup>; and 3) the last rate of 7.35 deaths/1000 people is based on the a 35% attack rate modeled after the 1918 pandemic, which was a highly virulent influenza strain where the death rate for 15 to 34-year-olds was 20 times higher in 1918 than in previous years (Column 6)<sup>1,2</sup>. The second set of projected deaths is modeled after the 1958 pandemic where 44% of deaths occurred in a 4-week span of time. Columns 7-9 represent the estimated number of deaths at their previously established specific mortality rates during one week of the peak period. In the event of a future pandemic, there could be more or less waves than 2, and it also could last longer or shorter than 24 weeks.

### **EXAMPLE**

County A's population was 282,913 people with 1,286 deaths due to all causes in 2004. The estimated total numbers of death for a medium-level, 1958-like, or 1918-like pandemic are 170, 430, or 2,079 deaths, respectively. These estimated totals include the normal number of flu deaths this county has in a normal season. The next set of data demonstrates the number of deaths that County A would see in 1 week during the peak period of the different pandemics. The one-week estimates for the medium-level, 1958-like, or 1918-like pandemics are 19, 47, or 229 deaths, respectively.

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<sup>1</sup> Calculated using FluAid 2.0 (<http://www.hhs.gov/nvpo/pandemics/>)

<sup>2</sup> Taubenberger, Jeffery et al. 1997. Initial Genetic Characterization of the 1918 "Spanish" Influenza Virus. Science. 275:1793-96.

**TOTAL DEATHS BY ALL CAUSES AND TOTAL AND WEEKLY PANDEMIC FLU DEATHS BY VIRGINIA STATE POLICE DIVISIONS FOR VIRGINIA  
(BASED ON 2004 POPULATION DATA)<sup>a</sup>**

CITY/COUNTY BY VSP DIVISIONS	NUMBER OF DEATHS BY PLACE OF OCCURRENCE							
	TOTAL POPULATION	TOTAL DEATHS in 2004 <sup>b</sup>	Total Projected Flu Deaths For 6 Months <sup>c</sup>			Total Deaths for 1 Week During Peak Period <sup>d</sup>		
			0.6/1000 <sup>e</sup>	1.52/1000 <sup>f</sup>	7.35/1000 <sup>g</sup>	0.6/1000	1.52/1000	7.35/1000
<b>COMMONWEALTH OF VIRGINIA</b>	<b>7,460,066</b>	<b>56,100</b>	<b>4,476</b>	<b>11,339</b>	<b>54,831</b>	<b>492</b>	<b>1,247</b>	<b>6,031</b>
<b>VSP DIVISION #1</b>	<b>1,229,523</b>	<b>10,709</b>	<b>738</b>	<b>1,869</b>	<b>9,037</b>	<b>81</b>	<b>206</b>	<b>994</b>
AMELIA COUNTY	11,936	68	7	18	88	1	2	10
CAROLINE COUNTY	24,013	122	14	36	176	2	4	19
CHARLES CITY COUNTY	7,105	26	4	11	52	0	1	6
CHESTERFIELD COUNTY	282,913	1,286	170	430	2,079	19	47	229
COLONIAL HEIGHTS CITY	17,516	114	11	27	129	1	3	14
DINWIDDIE COUNTY	25,182	102	15	38	185	2	4	20
ESSEX COUNTY	10,332	180	6	16	76	1	2	8
GOOCHLAND COUNTY	18,758	49	11	29	138	1	3	15
HANOVER COUNTY	96,069	820	58	146	706	6	16	78
HENRICO COUNTY	276,489	2,735	166	420	2,032	18	46	224
HOPEWELL CITY	22,363	367	13	34	164	1	4	18
KING AND QUEEN COUNTY	6,768	27	4	10	50	0	1	5
KING GEORGE COUNTY	19,356	79	12	29	142	1	3	16
KING WILLIAM COUNTY	14,348	69	9	22	105	1	2	12
LANCASTER COUNTY	12,037	248	7	18	88	1	2	10
LOUISA COUNTY	28,790	135	17	44	212	2	5	23
NEW KENT COUNTY	15,574	39	9	24	114	1	3	13
NORTHUMBERLAND COUNTY	12,896	54	8	20	95	1	2	10
NOTTOWAY COUNTY	15,624	105	9	24	115	1	3	13
PETERSBURG CITY	32,759	662	20	50	241	2	5	26
POWHATAN COUNTY	25,865	83	16	39	190	2	4	21
PRINCE GEORGE COUNTY	34,346	64	21	52	252	2	6	28
RICHMOND CITY	192,453	3,076	115	293	1,415	13	32	156
RICHMOND COUNTY	8,988	94	5	14	66	1	2	7
WESTMORELAND COUNTY	17,043	105	10	26	125	1	3	14
<b>VSP DIVISION #2</b>	<b>712,519</b>	<b>5,253</b>	<b>428</b>	<b>1,083</b>	<b>5,237</b>	<b>47</b>	<b>119</b>	<b>576</b>
CLARKE COUNTY	13,854	97	8	21	102	1	2	11
CULPEPER COUNTY	40,205	319	24	61	296	3	7	33
FAUQUIER COUNTY	63,256	466	38	96	465	4	11	51
FREDERICK COUNTY	66,638	265	40	101	490	4	11	54
FREDERICKSBURG CITY	20,456	753	12	31	150	1	3	17
HARRISONBURG CITY	41,082	589	25	62	302	3	7	33
MADISON COUNTY	13,132	71	8	20	97	1	2	11
ORANGE COUNTY	28,972	164	17	44	213	2	5	23
PAGE COUNTY	23,725	186	14	36	174	2	4	19
RAPPAHANNOCK COUNTY	7,170	29	4	11	53	0	1	6
ROCKINGHAM COUNTY	70,220	300	42	107	516	5	12	57
SHENANDOAH COUNTY	38,028	347	23	58	280	3	6	31
SPOTSYLVANIA COUNTY	111,846	333	67	170	822	7	19	90
STAFFORD COUNTY	114,773	258	69	174	844	8	19	93
WARREN COUNTY	34,372	287	21	52	253	2	6	28
WINCHESTER CITY	24,790	789	15	38	182	2	4	20
<b>VSP DIVISION #3</b>	<b>596,590</b>	<b>6,309</b>	<b>358</b>	<b>907</b>	<b>4,385</b>	<b>39</b>	<b>100</b>	<b>482</b>
ALBEMARLE COUNTY	88,731	475	53	135	652	6	15	72
AMHERST COUNTY	32,000	129	19	49	235	2	5	26
APPOMATTOX COUNTY	13,910	55	8	21	102	1	2	11
AUGUSTA COUNTY	68,758	649	41	105	505	5	11	56
BUCKINGHAM COUNTY	15,919	111	10	24	117	1	3	13
CAMPBELL COUNTY	51,695	189	31	79	380	3	9	42
CHARLOTTE COUNTY	12,415	68	7	19	91	1	2	10
CHARLOTTESVILLE CITY	36,609	1,344	22	56	269	2	6	30
CUMBERLAND COUNTY	9,179	32	6	14	67	1	2	7
FLUVANNA COUNTY	23,650	70	14	36	174	2	4	19
GREENE COUNTY	17,025	88	10	26	125	1	3	14
HALIFAX COUNTY	36,360	496	22	55	267	2	6	29

CITY/COUNTY BY VSP DIVISIONS ~CONTINUED	NUMBER OF DEATHS BY PLACE OF OCCURRENCE							
	TOTAL POPULATION	TOTAL DEATHS in 2004 <sup>b</sup>	Total Projected Flu Deaths For 6 Months <sup>c</sup>			Total Deaths for 1 Week During Peak Period <sup>d</sup>		
			0.6/1000 <sup>e</sup>	1.52/1000 <sup>e</sup>	7.35/1000 <sup>g</sup>	0.6/1000	1.52/1000	7.35/1000
<b>COMMONWEALTH OF VIRGINIA</b>	<b>7,460,066</b>	<b>56,100</b>	<b>4,476</b>	<b>11,339</b>	<b>54,831</b>	<b>492</b>	<b>1,247</b>	<b>6,031</b>
VSP DIVISION #3 (CONT.)	596,590	6,309	358	907	4,385	39	100	482
LUNENBURG COUNTY	13,090	35	8	20	96	1	2	11
LYNCHBURG CITY	64,923	1,433	39	99	477	4	11	52
MECKLENBURG COUNTY	32,500	411	20	49	239	2	5	26
NELSON COUNTY	14,902	89	9	23	110	1	2	12
PRINCE EDWARD COUNTY	20,323	312	12	31	149	1	3	16
STAUNTON CITY	23,847	172	14	36	175	2	4	19
WAYNESBORO CITY	20,754	151	12	32	153	1	3	17

VSP DIVISION #4	463,788	4,392	278	705	3,409	31	78	375
BLAND COUNTY	7,034	27	4	11	52	0	1	6
BRISTOL CITY	17,306	93	10	26	127	1	3	14
BUCHANAN COUNTY	25,206	244	15	38	185	2	4	20
CARROLL COUNTY	29,484	152	18	45	217	2	5	24
DICKENSON COUNTY	16,172	119	10	25	119	1	3	13
GALAX CITY	6,658	293	4	10	49	0	1	5
GILES COUNTY	16,985	182	10	26	125	1	3	14
GRAYSON COUNTY	16,490	110	10	25	121	1	3	13
LEE COUNTY	23,844	228	14	36	175	2	4	19
NORTON CITY	3,754	195	2	6	28	0	1	3
PULASKI COUNTY	35,145	316	21	53	258	2	6	28
RADFORD CITY	14,762	69	9	22	109	1	2	12
RUSSELL COUNTY	28,892	306	17	44	212	2	5	23
SCOTT COUNTY	22,982	158	14	35	169	2	4	19
SMYTH COUNTY	32,538	334	20	49	239	2	5	26
TAZEWELL COUNTY	44,755	474	27	68	329	3	7	36
WASHINGTON COUNTY	52,037	527	31	79	382	3	9	42
WISE COUNTY	41,745	297	25	63	307	3	7	34
WYTHE COUNTY	27,999	268	17	43	206	2	5	23

VSP DIVISION #5	1,758,821	13,482	1,055	2,673	12,927	116	294	1,422
ACCOMACK COUNTY	39,374	221	24	60	289	3	7	32
BRUNSWICK COUNTY	18,195	75	11	28	134	1	3	15
CHESAPEAKE CITY	214,715	1,217	129	326	1,578	14	36	174
EMPORIA CITY	5,674	174	3	9	42	0	1	5
FRANKLIN CITY	8,473	182	5	13	62	1	1	7
GLOUCESTER COUNTY	37,253	330	22	57	274	2	6	30
GREENSVILLE COUNTY	11,490	36	7	17	84	1	2	9
HAMPTON CITY	145,964	1,200	88	222	1,073	10	24	118
ISLE OF WIGHT COUNTY	32,784	168	20	50	241	2	5	27
JAMES CITY COUNTY	55,506	297	33	84	408	4	9	45
MATHEWS COUNTY	9,219	44	6	14	68	1	2	7
MIDDLESEX COUNTY	10,491	62	6	16	77	1	2	8
NEWPORT NEWS CITY	181,891	1,621	109	276	1,337	12	30	147
NORFOLK CITY	237,954	2,789	143	362	1,749	16	40	192
NORTHAMPTON COUNTY	13,297	317	8	20	98	1	2	11
POQUOSON CITY	11,705	38	7	18	86	1	2	9
PORTSMOUTH CITY	99,298	1,173	60	151	730	7	17	80
SOUTHAMPTON COUNTY	17,586	71	11	27	129	1	3	14
SUFFOLK CITY	76,599	780	46	116	563	5	13	62
SURRY COUNTY	6,969	16	4	11	51	0	1	6
SUSSEX COUNTY	11,914	62	7	18	88	1	2	10
VIRGINIA BEACH CITY	440,139	2,121	264	669	3,235	29	74	356
WILLIAMSBURG CITY	11,456	318	7	17	84	1	2	9
YORK COUNTY	60,875	170	37	93	447	4	10	49

CITY/COUNTY BY VSP DIVISIONS ~CONTINUED	NUMBER OF DEATHS BY PLACE OF OCCURRENCE							
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			0.6/1000 <sup>e</sup>	1.52/1000 <sup>f</sup>	7.35/1000 <sup>g</sup>	0.6/1000	1.52/1000	7.35/1000
<b>COMMONWEALTH OF VIRGINIA</b>	<b>7,460,066</b>	<b>56,100</b>	<b>4,476</b>	<b>11,339</b>	<b>54,831</b>	<b>492</b>	<b>1,247</b>	<b>6,031</b>
<b>VSP DIVISION #6</b>	<b>3,751,197</b>	<b>19,254</b>	<b>2,251</b>	<b>5,702</b>	<b>27,571</b>	<b>248</b>	<b>627</b>	<b>3,033</b>
ALLEGHANY COUNTY	16,742	304	10	25	123	1	3	14
BATH COUNTY	4,986	40	3	8	37	0	1	4
BEDFORD CITY	6,231	166	4	9	46	0	1	5
BEDFORD COUNTY	63,787	198	38	97	469	4	11	52
BOTETOURT COUNTY	31,781	107	19	48	234	2	5	26
BUENA VISTA CITY	6,227	72	4	9	46	0	1	5
COVINGTON CITY	6,258	22	4	10	46	0	1	5
CRAIG COUNTY	5,135	20	3	8	38	0	1	4
DANVILLE CITY	46,377	979	28	70	341	3	8	37
FLOYD COUNTY	14,465	89	9	22	106	1	2	12
FRANKLIN COUNTY	49,852	375	30	76	366	3	8	40
HENRY COUNTY	56,938	229	34	87	418	4	10	46
HIGHLAND COUNTY	2,482	13	1	4	18	0	0	2
LEXINGTON CITY	6,917	117	4	11	51	0	1	6
MARTINSVILLE CITY	15,039	521	9	23	111	1	3	12
MONTGOMERY COUNTY	83,983	610	50	128	617	6	14	68
PATRICK COUNTY	19,241	207	12	29	141	1	3	16
PITTSYLVANIA COUNTY	61,759	205	37	94	454	4	10	50
ROANOKE CITY	92,329	1,718	55	140	679	6	15	75
ROANOKE COUNTY	87,682	488	53	133	644	6	15	71
ROCKBRIDGE COUNTY	21,084	102	13	32	155	1	4	17
SALEM CITY	24,336	850	15	37	179	2	4	20
<b>VSP DIVISION #7</b>	<b>1,975,194</b>	<b>8,523</b>	<b>1,185</b>	<b>3,002</b>	<b>14,518</b>	<b>130</b>	<b>330</b>	<b>1,597</b>
ALEXANDRIA CITY	128,206	972	77	195	942	8	21	104
ARLINGTON COUNTY	186,144	1,538	112	283	1,368	12	31	150
FAIRFAX CITY	22,072	201	13	34	162	1	4	18
FAIRFAX COUNTY	1,003,140	3,951	602	1,525	7,373	66	168	811
FALLS CHURCH CITY	10,777	36	6	16	79	1	2	9
LOUDOUN COUNTY	239,181	605	144	364	1,758	16	40	193
MANASSAS CITY	37,626	461	23	57	277	2	6	30
MANASSAS PARK CITY	11,521	12	7	18	85	1	2	9
PRINCE WILLIAM COUNTY	336,527	747	202	512	2,473	22	56	272

<sup>a</sup> All projected pandemic flu deaths are estimates only. Data is based on population counts from 2004.

<sup>b</sup> Total Deaths: The number of deaths by all causes (AIDS, heart disease, gunshot wounds, narcotic abuse, etc.) seen in 2004.

<sup>c</sup> Projected flu deaths include those deaths that would normally occur due to flu regardless of pandemic status.

<sup>d</sup> Peak Period Deaths: Estimated number of deaths that would occur for 1 week of a 4-week peak period of a 24-week pandemic event.

<sup>e</sup> Estimated, average mortality rate (0.6 deaths/1000 people) by VA Department of Health for a "medium level" pandemic.

<sup>f</sup> Estimated mortality rate (1.52 deaths/1000 people) based on a worst-case scenario using a 35% attack rate modeled after the 1958 & 1968 pandemics.

<sup>g</sup> Estimated mortality rate based on a 35% attack rate modeled after the 1918 pandemic.

