

Population with Highest Burden of High Blood Pressure in Missouri

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<http://www.health.mo.gov>

Background High blood pressure (Hypertension) can be classified as either essential or secondary. Essential hypertension means that no medical cause can be found to explain the elevated blood pressure and represents about 90-95 percent of high blood pressure cases.¹ Secondary hypertension indicates that the high blood pressure is a result of another condition, such as kidney disease or tumors (pheochromocytoma or adrenal adenoma). High blood pressure is one of the leading causes of heart disease, stroke and chronic renal failure. Even moderate elevation of arterial blood pressure leads to shortened life expectancy.² Although control of high blood pressure clearly reduces the risks of cardiovascular and renal diseases, large segments of the US population with high blood pressure are either untreated or inadequately treated.³ The objective of this report is to identify the population with the highest burden of high blood pressure in Missouri to assist public health programs with targeting prevention efforts.

Prevalence of High Blood Pressure Among adults in Missouri, the prevalence of high blood pressure significantly increased from 26.5 percent in 2001 to 30.6 percent in 2009. In 2011, it was estimated that over 1.5 million adult Missourians had high blood pressure. The prevalence increased as age increased and when household income or education attainment decreased. Overall, the prevalence was highest among those 65 or older, those with a household income lower than \$15,000, and those with less than a high school education. In addition, African-Americans had significantly higher prevalence than whites (Table 1). Geographically, the prevalence was higher in the Southeastern Region than in other parts of the State. While Pemiscot County in the Southeastern Region had the highest prevalence (54.8 percent) among all 114 counties and the City of St. Louis, St. Louis County had the highest number of people (344,549) with high blood pressure, which is reflective of higher population density (Table 2).

Emergency Room Visit Rates From 2002 to 2011, the emergency room visit rate for high blood pressure increased significantly from 1.6 per 1,000 to 2.5 per 1,000 in Missouri. In 2011, 15,817 Missourians visited emergency rooms with high blood pressure as the principal diagnosis. The emergency room visit

rate increased with age and was highest among those aged 65 or older. The rate was significantly higher among women than among men. African-Americans had a significantly higher rate than whites (Table 3). The Southeastern Region had the highest rate among all regions based on the 10-year average annual rate from 2002 to 2011. While Pemiscot County in the Southeastern Region had the highest rate (5.4 per 1,000), Jackson County had the highest average annual number (1,838) of visits from 2002 to 2011 (Table 2).

Hospitalization Rates From 2002 to 2011, the inpatient hospitalization rate for high blood pressure decreased slightly from 10.5 per 10,000 to 10.2 per 10,000 in Missouri. In 2011, 6,724 Missourians were hospitalized for treatment of high blood pressure. The hospitalization rate was significantly higher among older Missourians and African-Americans (Table 4). The 10-year average annual hospitalization rate was highest in the Southeastern Region, but St. Louis City had the highest rates (25.4 per 10,000) among all 114 counties and the City of St. Louis. St. Louis County, however, had the highest average annual number of hospitalizations (1,336), followed by Jackson County (863, Table 2).

Death Rates from Essential Hypertension From 2002 to 2011, 4,423 people died in Missouri with essential hypertension as the underlying cause of death, with an annual average death rate of 6.8 per 100,000 population. The death rate was significantly higher among older Missourians and African-Americans (Table 5). While the average annual age-adjusted death rate was highest in Moniteau County (31.6 per 100,000), St. Louis County had the highest average annual number (59) of deaths in the ten years (Table 2). Of note, high blood pressure doubles the risk of cardiovascular diseases including heart diseases and stroke.³ Deaths attributed to high blood pressure would be substantially underestimated unless the deaths from stroke and heart disease are also considered.

In fact, from 2002 to 2011, annual average death rate for heart disease was extremely high (229.6 per 100,000 population) in Missouri, with the highest rate



(422.0 per 100,000) in Washington County. Heart disease as the underlying cause of death averaged 13,406 Missourians a year during this time frame, with the highest death number (2442) in St. Louis County (Table 2). From 2002 to 2011, annual average death rate for stroke also reached 50.7 per 100,000 population, with the highest rate (83.1 per 100,000) in Dunklin County. Stroke as the underlying cause led to death of 3,296 Missourians each year, with the highest death number (586) in St. Louis County (Table 2).

Although the prevalence, emergency-room-visit, hospitalization and death data help define the burdens of high blood pressure in Missouri, there is no surveillance system to monitor how many Missourians have pre-hypertension. In addition, there is no data system to monitor how many Missourians with hypertension are undiagnosed, diagnosed but not under treatment, and under treatment but not controlled. These hypertension-related burdens should also be monitored in future.

Summary In Missouri, high blood pressure disproportionately affected distinct population groups: the elderly, African-Americans, people with low income and people with low educational level. The Southeastern Region, especially counties in the Bootheel area, had the highest burden in terms of the proportion of the population affected by high blood pressure, whereas St. Louis County had the highest burden in terms the actual number of people affected.

Data Sources

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10. Death MICA, 1997-2007

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Table 1. Prevalence of Hypertension in Adult Missourians, 2011^{4,5}

	Number	Percent		Number	Percent
Missouri	1,577,308	34.3	Income (\$/year)		
Age (years)			≥ 50,000	–	29.9
18-24	57,428	9.7	49,999-35,000	–	30.5
25-34	104,766	13.3	34,999-25,000	–	36.8
35-44	164,016	22.3	24,999-15,000	–	40.8
45-54	313,235	35.8	≤ 14,999	–	39.6
55-64	392,676	52.1	Education ^{4,6}		
≥ 65	554,669	64.9	College graduate	290,342	26.4
Gender			Some college	485,279	32.9
Female	791,356	33.3	HS ^a graduate	546,904	38.2
Male	786,632	35.4	Less than HS	242,226	41.3
Race					
White	1,363,336	34.4			
AA ^b	178,122	40.0			

^aHS, high school. ^bAfrican-American. ^bAA, African-American

Table 2. Burdens of cardiovascular disease in Missouri Counties

Hypertension	Year	Click a link to a map
Prevalence ⁷	2011	prevalence
Emergency Room Visits	2002-2011	emergency
Hospitalizations	2002-2011	hospitalization
Death	2002-2011	mortality
Heart diseases	2002-2011	mortality
Stroke	2002-2011	mortality

Table 3. Emergency Room Visits for Hypertension, 2011⁸

	Number	Rate ^a		Number	Rate ^a
Missouri	15,817	2.5	Gender		
Age (years)			Male	6,424	2.1
< 15	34	0	Female	9,393	2.8
15-24	338	0.4	Race		
25-44	3,766	2.5	White	10,600	1.9
45-64	6,274	3.9	African American	4,686	7.1
≥ 65	5,405	6.3			

^a Per 1,000. Age adjustment used the 2000 Standard Population.

Table 4. Hospitalizations for high blood pressure, 2011⁹

	Number	Rate ^a		Number	Rate ^a
Missouri	6,724	10.2	Gender		
Age (years)			Male	3,076	10.1
< 15	25	0.2	Female	3,648	10.0
15-24	137	1.6	Race		
25-44	913	6.0	White	3,892	6.4
45-64	2,571	15.8	African American	2,609	40.8
≥ 65	3,078	36.0			

^a Per 10,000. Age adjustment used the 2000 Standard Population.

Table 5. Deaths with essential hypertension as the underlying cause, Missouri, 2002-2011¹⁰

	Number	Rate ^a		Number	Rate ^a
Missouri	4,423	6.8	Gender		
Age (years)			Male	1,648	6.5
< 15	0	0.0	Female	2,775	6.7
15 to 24	3	0.0	Race		
25 to 44	73	0.5	White	3,618	6.0
45 to 64	545	3.6	African American	778	16.0
≥ 65	3,802	47.7			

^a Per 100,000. Age adjustment used the 2000 standard population.