

## Hypertension in Virginia

Hypertension, or high blood pressure, is a common acute and chronic condition that can be easily diagnosed through widespread screening and early diagnosis, and can be controlled with changes in behavior and relatively easy and low cost disease management. Reduction in the number and severity of the side effects and progression to other diseases can be achieved in most cases with routine medical care and population-based approaches.

### Key Hypertension Facts:

- **Incidence and Prevalence in the U.S. and Virginia**

Across the U.S., over 68 million adults, or one in every three individuals, have high blood pressure. Of this population, over half, or 36 million, do not have their blood pressure under control. In addition to those with diagnosed hypertension, about 30 percent of American adults suffer from prehypertension. The southeastern U.S., particularly the far southern states, has the highest prevalence rates; Virginia is at about the median level compared with the entire U.S. in prevalence. In 2010 it was estimated that 31.2 percent of Virginians, or over 1.9 million individuals, reported they had been diagnosed with hypertension.

- **Death numbers and rates:** In 2010, the age-adjusted death rate from hypertension was 14.4 per 100,000 population; this amounted to 1,142 deaths directly attributed to hypertension, which is the 13<sup>th</sup> leading cause of death in both Virginia and the U.S.

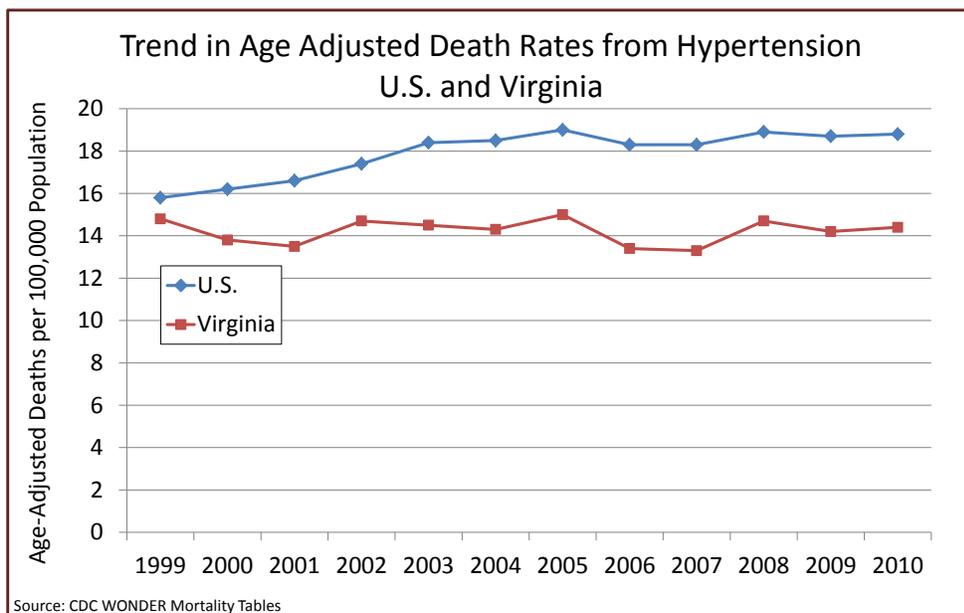
- **Trends in Virginia and the U.S.:**

The age adjusted death rate due to hypertension increased about 14% across the U.S. from 1999 to 2010; in contrast, the age adjusted death rate from hypertension in Virginia showed a slight decline, about 2.7%, during the same period. The raw number of deaths in Virginia increased from 904 to 1,142 due to the growth and aging of the population.

- **Years of Potential Life Lost:**

Based on patient reports of having been diagnosed with hypertension, it is estimated that 3,491 potential years of life (PYLL) were lost directly due to hypertension in Virginia in 2010.

- **Hospital trends:** There were a total of 6,868 inpatient cases in Virginia hospitals with a primary diagnosis of hypertension, with charges totaling \$216,655,480 and average charges per case of \$31,546. Of these cases, the greatest number was due to hypertensive chronic kidney disease, followed by over 2,000 cases with essential hypertension.



### 2011 Virginia Inpatient Discharges for Hypertension by Diagnosis Code Groups

ICD-9 Diagnosis Groups	Discharges	Total Charges	Average Charge/Discharge
Essential Hypertension	2,038	\$32,143,405	\$15,772
Hypertensive Heart Disease	1,003	\$26,915,091	\$26,835
Hypertensive Chronic Kidney Disease	2,279	\$89,019,534	\$39,061
Hypertensive Heart & Renal Disease	1,527	\$67,850,136	\$44,434
Secondary Hypertension	21	\$727,314	\$34,634
<b>Total w Hypertension Primary diagnosis</b>	<b>6,868</b>	<b>\$216,655,480</b>	<b>\$31,546</b>

Source: VHI via Intellimed; both inpatient hospital data sets include ICD-10 Diagnosis Codes 401-405.

- Hospitalizations for hypertension and its complications in Virginia hospitals in 2011 resulted in many secondary effects which resulted in the need for a variety of procedures and services, as indicated by their Medicare Severity Diagnosis Related Group (MS DRG) assignments. Kidney and related diseases were the most frequent complications resulting in hospitalization beyond hypertension itself:

### 2011 Virginia Inpatient Discharges for Hypertension by MS DRG Groups

MS DRG Categories	Discharges	Total Charges	Average Charge/Discharge
Acute myocardial infarction & heart failure	2,220	\$62,061,397	\$27,956
Amputation	3	\$363,702	\$121,234
Cardiovascular procedure	25	\$2,062,066	\$82,483
Cardiovascular surgery	93	\$17,131,771	\$184,213
Electrophysiology (pacemakers, etc.)	69	\$8,372,366	\$121,339
Hypertension	2,099	\$30,570,781	\$14,564
Kidney & urinary tract disease	2,318	\$90,944,789	\$39,234
Other procedures	41	\$5,148,608	\$125,576
<b>Total</b>	<b>6,868</b>	<b>\$216,655,480</b>	<b>\$31,546</b>

Source: VHI via Intellimed; both inpatient hospital data sets include ICD-9 Diagnosis Codes 401-405.

#### Definitions:

- **Hypertension:** the commonly used term for high blood pressure, where blood pressure is above 120/80.
- **Blood pressure:** this is a measurement of the force of the blood pumped throughout the body by the heart against the inside of the blood vessels; the force is measured as millimeters of mercury (Hg). Two numbers are used to measure blood pressure, and one or both numbers may indicate the status of an individual's blood pressure; 120 over 80 mm Hg (120/80 mmHg) is an example; normal blood pressure is defined when blood pressure is 120/80 or lower for both numerator and denominator.
- **Systolic Blood pressure:** the first of the two numbers used to measure blood pressure, the systolic blood pressure is a measurement of the maximum pressure exerted on the wall of the arteries and blood vessels, and is a result of the pressure of the beat or contraction of the heart, specifically the left ventricle.
- **Diastolic blood pressure:** the second of the two numbers used to measure blood pressure, the diastolic pressure is a measurement of the pressure exerted on the walls of the blood vessels between heart beats when the heart is relaxed.

- **Prehypertension:** elevated blood pressure that is not in the hypertension range but is elevated above normal levels puts the individual at risk for development of hypertension; in prehypertension, blood pressure is between 120 and 139 systolic and 80 to 89 diastolic; measures above 139/89 are considered hypertension.
- **Essential hypertension:** hypertension with no known cause.

**Symptoms, Warning Signs and Diagnosis of Hypertension**

In the majority of cases, there are no warning signs or symptoms of hypertension that individuals can identify, but instead must be diagnosed through a simple, non-invasive blood pressure test. Advanced or severe hypertension may result in severe headache, nausea, vomiting, confusion, and changes in vision or nosebleed. The danger of hypertension is that the lack of symptoms in many cases may result in heart disease or kidney problems before hypertension is diagnosed.

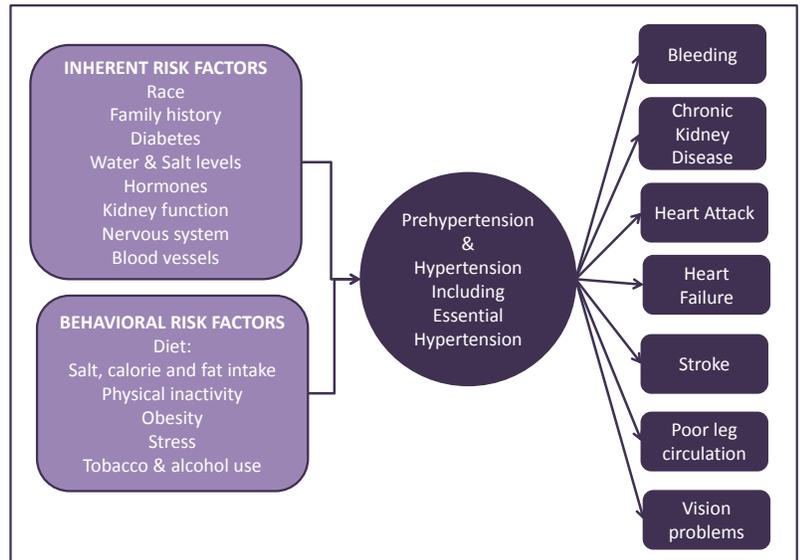
Because accurate measurements of high blood pressure may depend on anxiety, mood or time of day, multiple readings may be necessary to confirm a diagnosis. In addition, other testing may be needed to determine whether hypertension may have resulted in heart disease, damage to the eyes or to the kidneys, including:

- Cholesterol levels to identify cardiovascular disease
- Electrocardiogram or echocardiogram to determine the presence of heart disease
- Basic metabolic panel, urinalysis or kidney ultrasound to identify kidney disease

Once an individual is diagnosed with hypertension, they may choose to use a home-based blood pressure device to enhance the accuracy and frequency of blood pressure monitoring. Training to use such devices is important to assure accuracy of readings and consistency with office-based results.

**Risk Factors**

- **Inherent risk factors:** those factors over which the individual has no control; these include age, race (with African American having a predisposition to hypertension), stress or anxiety, family history of hypertension, diabetes, condition of the kidneys, hormonal levels, water and salt content of the body.
- **Behavioral risk factors:** factors which the individual can influence through behavior include obesity due to poor diet and physical inactivity, excessive alcohol consumption, smoking, and high salt diet.



**Impact of Hypertension on Health**

Hypertension is the underlying cause of many other conditions which also result in chronic illness and elevated mortality. These include excessive bleeding (aneurysms), chronic kidney disease, heart attack, heart failure,

stroke (may be from a bleed or an aneurysm in the brain), poor leg circulation leading to amputation, and vision problems.

### Treatment of Hypertension –Intention to Reduce Risk of Complications

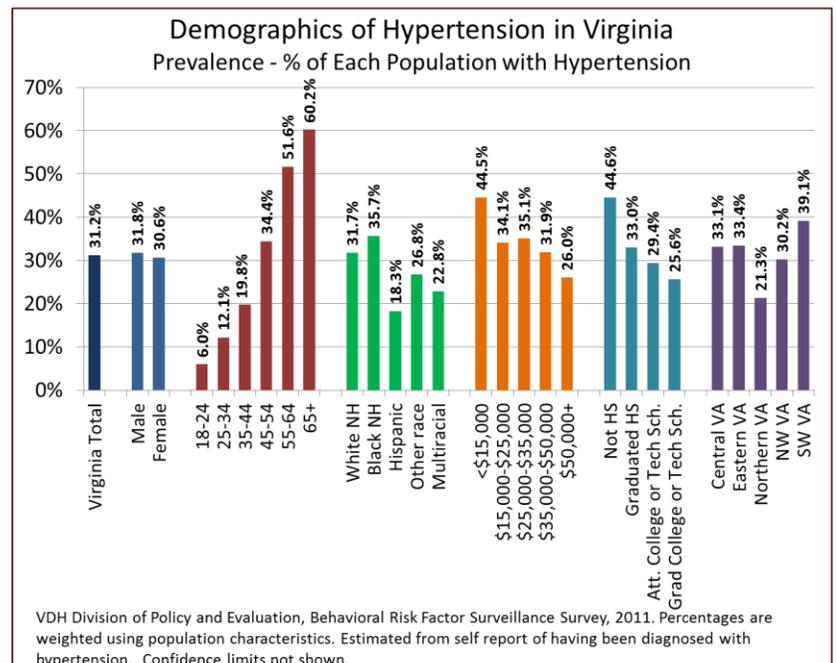
It has been estimated that reducing average sodium intake from 3,300 mg to 2,300 mg per day could reduce the number of cases of prehypertension and hypertension significantly by 11 million across the U.S.

- **Prehypertension:** lifestyle changes include heart healthy diet, regular exercise, discontinuation of smoking, reduction in use of alcohol, reduced sodium (salt) intake, stress reduction through yoga, meditation or lifestyle changes, and maintenance of a healthy body weight.
- **Hypertension:** lifestyle and dietary changes plus treatment with single or multiple medications which reduce salt and water retention or alter heart and blood vessel flexibility and action; each medication may be used alone or in combination with others.

### Socio-Demographics of Hypertension in Virginia

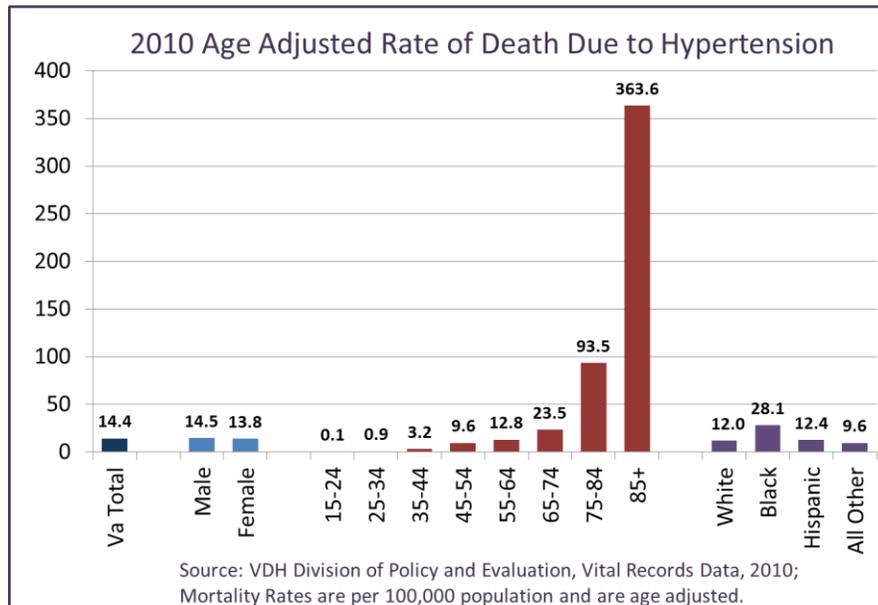
Almost one third of Virginians of all ages and demographic groups, amounting to 31.2% of the total population or over 1,9 million individuals, report having been diagnosed with hypertension. Distribution among different populations and regions vary considerably:

- **Gender:** men are slightly more likely to be diagnosed with hypertension compared with women.
- **Age:** the prevalence of hypertension increases directly with age, with very low rates among those under age 44; however prevalence increases dramatically, with those over age 55 to be much more likely to report having been diagnosed with hypertension.
- **Race:** those individuals of African American descent experience higher prevalence rates of hypertension, and those of Hispanic heritage having lower rates than average.
- **Income Level:** Individuals with annual incomes below \$15,000 are almost twice as likely to report having been diagnosed with hypertension compared with those earning over \$50,000 per year.
- **Education Level:** there is a direct relationship between education level and diagnosis of hypertension, with higher levels among those with less education; graduation from college or technical school is associated with lower prevalence of hypertension.
- **Region:** prevalence of hypertension is significantly higher in Southwestern Virginia, with almost 40% of residents having been diagnosed with high blood pressure; rates are lower than the state average of 31.2% in Northern Virginia.



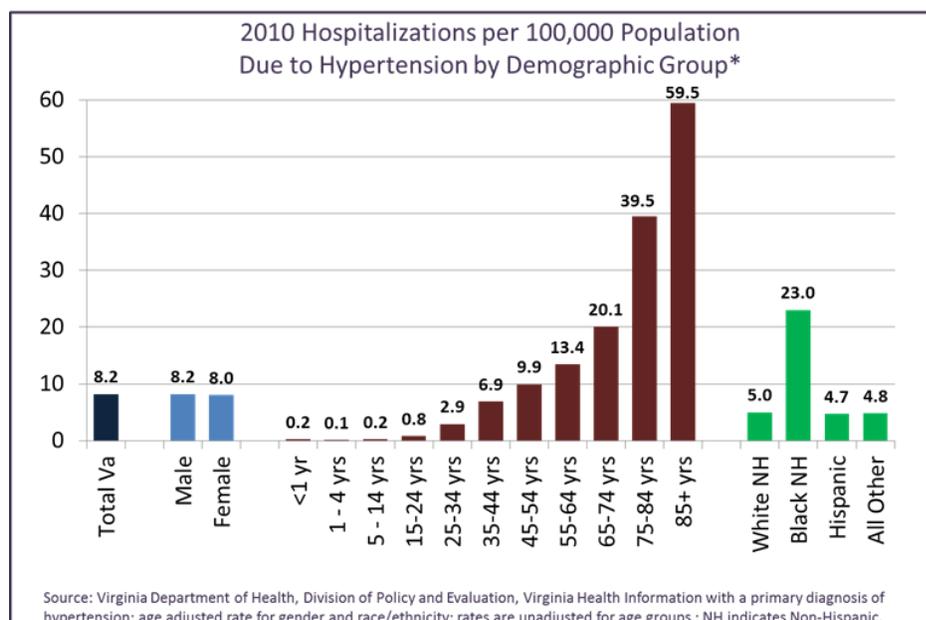
### Mortality from Hypertension

- **Gender:** The age-adjusted rate of death from hypertension is similar but slightly lower for women than men.
- **Age:** Mortality is low for most age groups; however, after age 65, the death rate increases and is elevated to 94 per 100,000 for those ages 75-84 and 364 per 100,000 in the over 85 population.
- **Race:** Mortality for Blacks is more than double the rate for other races.



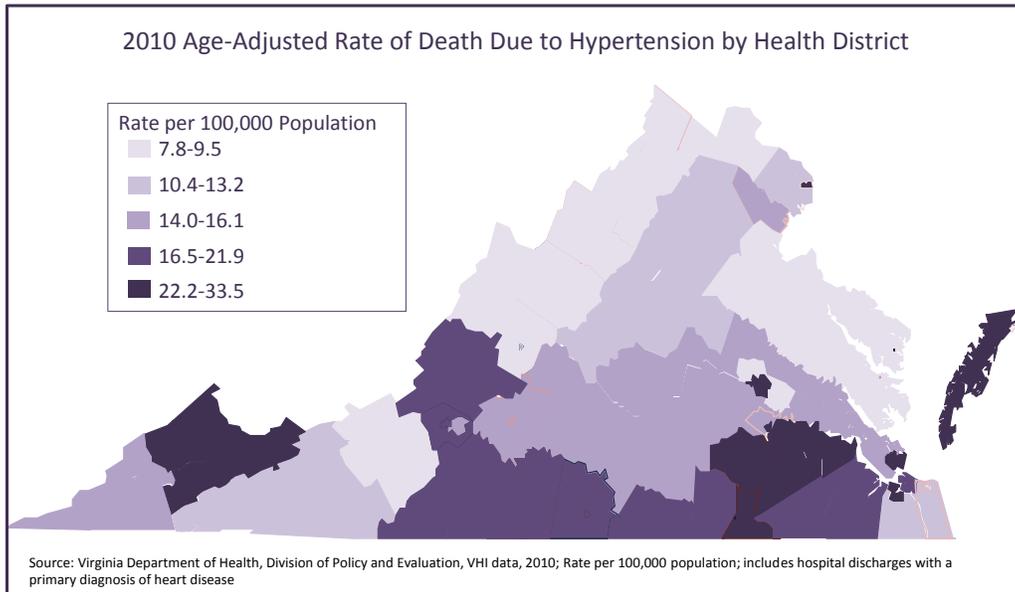
### Morbidity – Hospitalization Rates

- **Gender:** Inpatient hospitalization rates are similar between men and women.
- **Age:** Hospitalization rates increase directly with age, with those ages 75-84 and 85+ showing the highest rates.
- **Race:** Non-Hispanic Blacks have more than quadruple the hospitalization rates of any other racial group.



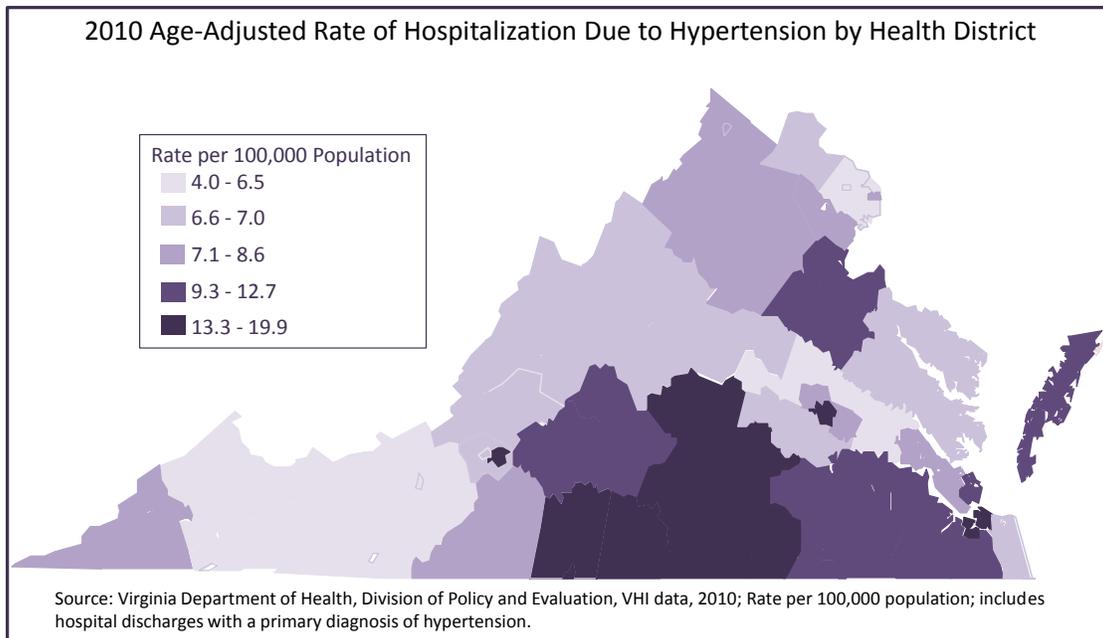
## Regionality of Hypertension

- **Death Rate:** Within Virginia, the areas with the highest death rates are the Eastern Shore and Southside Virginia, with elevated rates also in the far southwest as well as in the cities of Richmond, Hampton, Portsmouth and Norfolk. Death rates from hypertension vary widely, with a fourfold difference between high and low death rate regions.



- **Hospitalization Rate:**

The pattern of hospitalization rates also vary widely across Virginia, with the cities of Richmond, Roanoke, Portsmouth and Norfolk having the highest rates along with southside Virginia.



**References:**

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