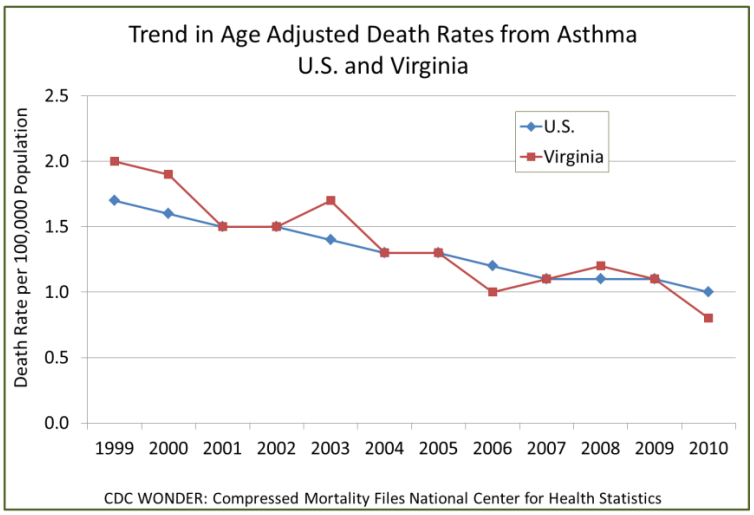
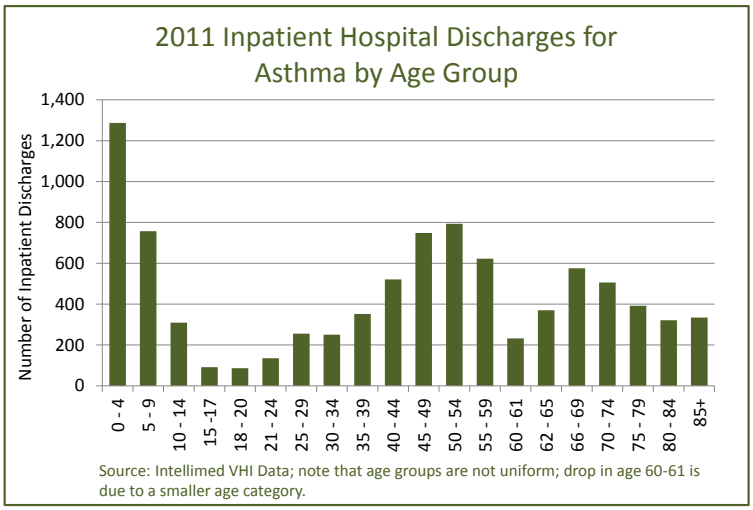
Asthma in Virginia

Asthma is a long term chronic lung disease affecting people of all ages, but which often starts in childhood. Asthma is not curable but it is a manageable condition and often decreases in severity over time. While potentially life-threatening, normal activities are usually possible with good medical care. However, the cost of medication is an obstacle to optimal asthma care, particularly for disadvantaged populations.

Key Asthma Facts:

- **Prevalence in the U.S. and Virginia**: in 2010, 788,458 adults in Virginia reported having been told by a physician that they had been diagnosed with asthma; this represents 12.8 percent of the total population; in addition to adults, a significant number of children also live with asthma; across the U.S., more than 25 million individuals are known to have asthma, including 7 million children.
- **Asthma as a Public Health Issue:** the cost of asthma for the U.S. was $56 billion in 2010; the cost per year per child with asthma in 2010 was over $1,000; in 2008, there were 10.5 million missed days of school and 14.2 missed days of work across the U.S. due to asthma.
- **Asthma Growth Rate;** in the last 10 years, the prevalence of asthma grew 15%, resulting in increased emergency department visits, physician visits and hospital admissions.
- **Mortality Trends and Rates**: the 2010 Virginia asthma mortality rate was 0.8 per 100,000 population compared with the U.S. rate of 1.0 per 100,000; asthma mortality rates have declined in both the U.S. (-41%) and in Virginia (-61%) between 1999 and 2010; the number of deaths also declined in Virginia, from 131 in 1999 to 69 in 2010.
- **Years of Potential Life Lost**: there was a total of 491 Years of Potential Life Lost due to asthma in Virginia in 2010.
- **Hospital Utilization Patterns:**
  In 2011, there were 8,936 admissions of Virginia residents to Virginia hospitals where the primary diagnosis was asthma; the total charges for these cases was $147,008,133 or an average of $16,451 per case; there is a marked difference among age groups for inpatient hospitalization, with a bimodal distribution; children aged under 4 had the greatest number of discharges, with a second rise in case volume around the 45-49 and 50-54 age groups, diminishing slightly among the oldest populations (80 and older).





Hospitalization patterns differed among the basic categories of asthma and age groups, with chronic obstructive asthma affecting the older populations and unspecified asthma types affecting children under age 17.

2011 Inpatient Hospital Discharges for Asthma by Diagnosis Code Group and Age Group

ICD-9 Category	0-17	18-44	45-64	65+	Total
Allergic (Extrinsic) Asthma (493.00-493.02)	220	82	71	33	406
Non-allergic (Intrinsic) Asthma (493.11-493.12)	10	5	5	3	23
Chronic Obstructive Asthma (493.20-493.22)	8	305	1,605	1,469	2,287
Exercise Obstructive Asthma (493.81-493.82)	1	3	3	1	8
Asthma unspecified (493.90-493.92)	2,205	1,204	1,081	622	5,211
Total Asthma discharges	**2,444**	**1,599**	**2,765**	**2,128**	**8,936**

Source: VHI via Intellimed; both inpatient hospital data sets include ICD-9 Diagnosis Codes 493.00-493.92

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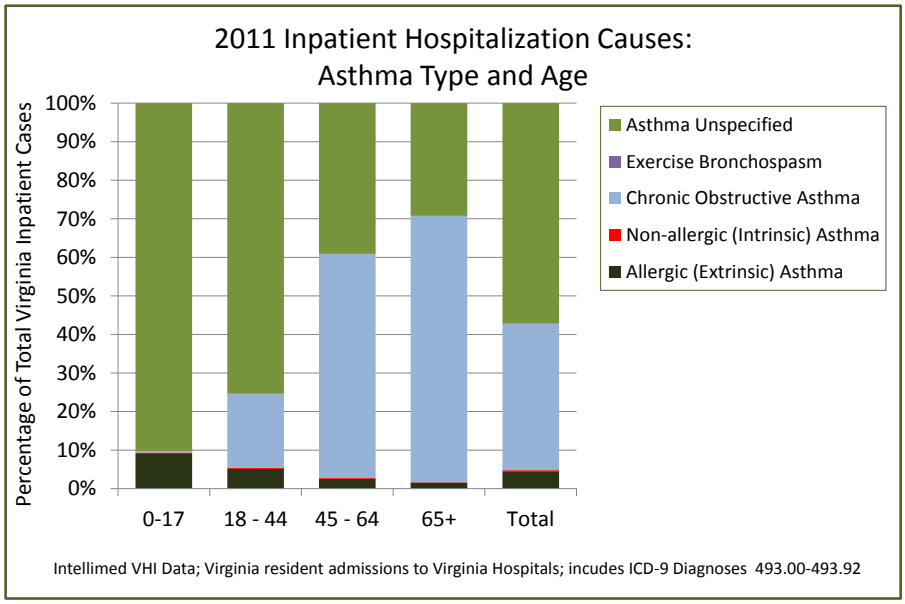


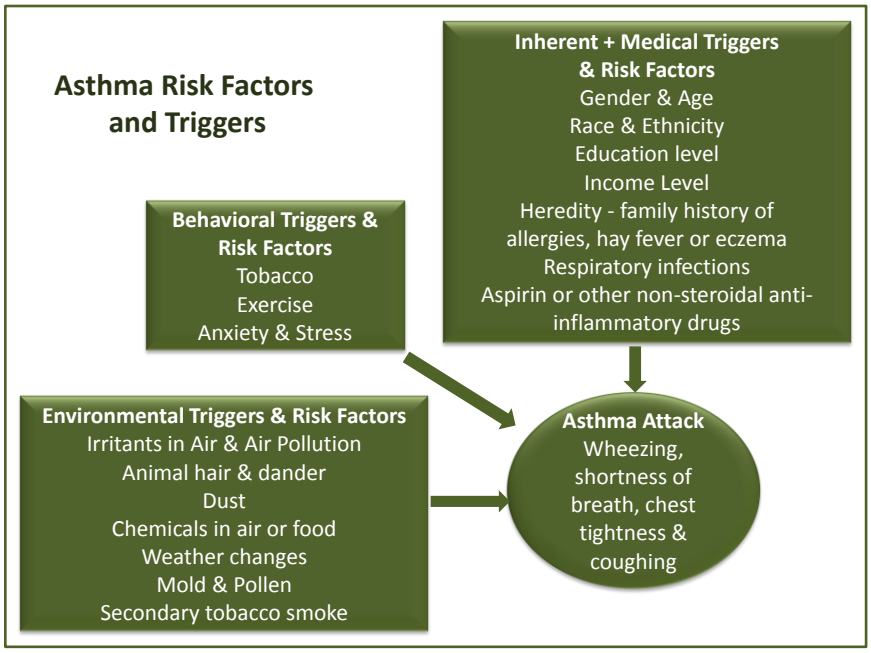
Definitions

- **Asthma:** a chronic, long term lung disease that inflames and narrows the airways, resulting in wheezing, chest tightness, shortness of breath and coughing; attacks or episodes are most frequent at night or early in the morning; both adults and children can develop asthma.
- **Asthma attack (flare-up or exacerbation):** sudden onset of asthma symptoms; when the airways react, the muscles around them tighten, narrowing the airway, and mucus often is produced, which further narrows the airways.
- **Intrinsic (non-allergic) asthma:** a chronic, inflammatory disorder of the airways characterized by wheezing, breathing difficulties, coughing, chest tightness caused by inhalation of an irritant but not caused by an allergic reaction; non-allergic asthma is triggered by other factors such as anxiety, stress, exercise, cold air, dry air, hyperventilation, smoke, viruses or other irritants. In non-allergic asthma, the immune system is not involved in the reaction.

- **Extrinsic (allergic) asthma:** a chronic, inflammatory disorder of the airways characterized by wheezing, breathing difficulties, coughing, chest tightness, caused by an allergic reaction to an inhaled allergen from the environment; this is the most common type of asthma, caused by external materials which cause a response from the immune system in the form of an allergic reaction.
- **Spirometry:** a test for diagnosing asthma which evaluates lung function by measuring the maximum volume that can be exhaled after breathing in the maximum amount of air; measures the strength of the lungs related to the narrowing of airways caused by asthma.

Risk Factors and Triggers

- **Environmental risk factors & triggers:** both intrinsic (non-allergic) and extrinsic (allergic) asthma may be triggered by materials in the environment which may either cause irritation or an allergic reaction, resulting in an asthma attack; these include particulates such as dust, mold, pollen, smoke or animal hair and dander; alternatively, chemicals in the air may trigger attacks and may include air pollution, perfume and other chemicals; finally, changes in temperature can trigger asthma attacks.



- **Behavioral risk factors and triggers:** smoking, exercise and heightened anxiety and stress may trigger asthma attacks.
- **Inherent risk factors and triggers:** family history of allergies, hay fever or eczema may predispose an individual towards asthma; in addition certain genders, age groups, racial groups and ethnicities have higher asthma incidence; education and income levels are risk factors, as well as medical conditions such as respiratory infections and use of certain medications.

Description, Symptoms, Warning Signs and Diagnosis of Asthma

- **Symptom Types:** Asthma is a chronic inflammatory disease of the airways which is characterized by two sets of symptoms:
  1. The bronchi (the airway branches leading to the lungs) become overly reactive and sensitive to all kinds of triggers including allergens, cold air, dry air, smoke, viruses and other triggers;
  2. The lungs are unable to move air in and out, due to airflow obstruction;

  The combined effect results in coughing, wheezing, tight chest and other symptoms and conditions.
- **Pattern of Asthma:** Asthma is characterized by symptom-free periods with periodic attacks, although many people with asthma have some wheezing, shortness of breath and coughing at all times.

- **Symptoms**: The symptoms of asthma include:
    - Cough with or without sputum (phlegm) production
    - Intercostal retractions – pulling in of the skin between the ribs when breathing
    - Shortness of breath that worsens with activity
    - Wheezing which often starts suddenly, may be episodic, increasing in the morning or evening, improves with bronchodilators and worsens when breathing cold air and with exercise.
- **Emergency Symptoms – GO TO AN EMERGENCY ROOM if any of these symptoms occur:** bluish color (face and lips, indicating insufficient oxygen), drowsiness or confusion, extreme difficulty breathing, rapid pulse, severe anxiety due to insufficient air; in addition an attack may be characterized by abnormal, uneven breathing pattern, cessation of breathing, chest pain or tightness in the chest.
- **Diagnosis of Asthma:** a full battery of tests may be used to diagnose asthma and to differentiate it from other conditions; these include:
    - Evaluation of lung sounds using a stethoscope (wheezing, other lung sounds)
    - Allergy testing to identify allergens
    - Arterial blood gas test to determine levels of blood oxygen
    - Chest x-ray
    - Lung function tests
    - Peak flow measurements to measure the ability of the lungs to expel air
    - Blood tests to measure eosinophil (white blood cell) and IgE (immunoglobulin) levels as identifiers of immune response to allergens

Treatment of Asthma – Treatment Plan and Medication:

A combined approach using treatment planning and use of medication is necessary for the control of asthma symptoms. The intent of asthma treatment is to reduce exposure to triggers and to control the swelling of the airways; treatment should always include the development of a written plan to eliminate the triggers, to monitor symptoms and to manage asthma attacks when they occur; medications may be used, and have two main functions:

- **Control drugs:** to prevent asthma attacks; these include beta-agonist inhalers to prevent symptoms and are often taken long term along with inhaled steroid medication.
- **Rescue drugs**: to provide rapid relief and to reduce the symptoms of an attack; these are taken at the time of an asthma attack to quickly reduce symptoms (when coughing, wheezing or having trouble breathing); can also be taken prior to exercise to prevent exercise-induced symptoms; these include bronchodilators or oral steroids.
- **Other medications:** additional medical care may be needed for severe asthma attacks that cannot be controlled with rescue drugs and may include intravenous medications, oxygen, breathing assistance and other treatments.

Impact of Asthma on Health: while there is no cure for asthma, proper medical care and self-management can reduce the frequency and seriousness of asthma attacks. Key elements to prevention of asthma attacks involve avoidance of triggers:

- Use of “allergy-proof” casings for bedding
- Minimize use of carpets and rugs, and vacuum frequently

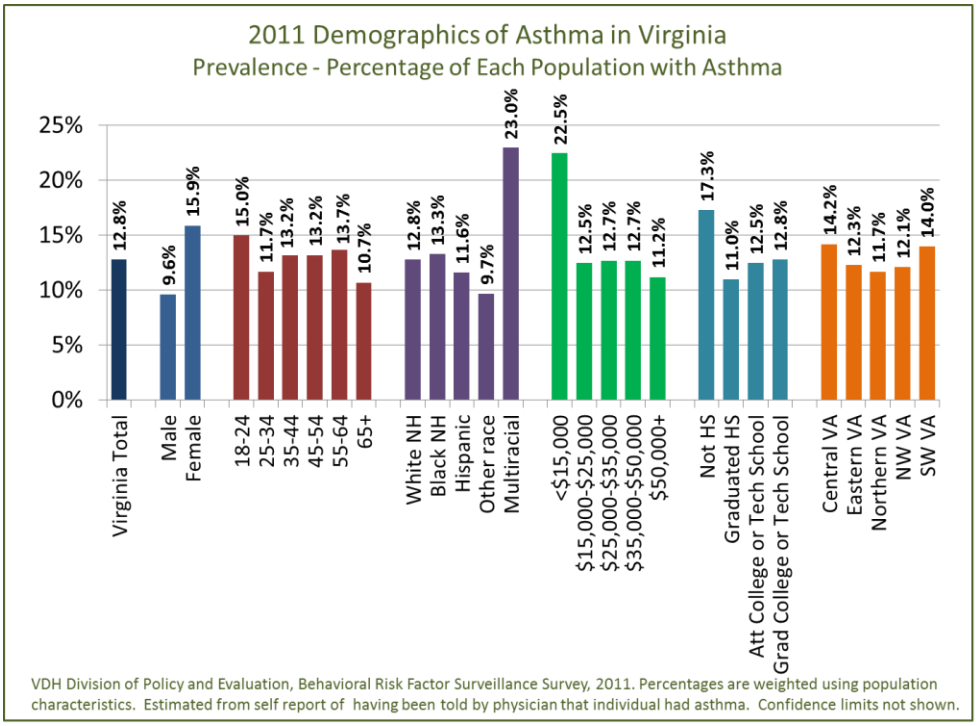
- Use only unscented cleaning materials
- Keep humidity low and reduce growth of organisms such as mold
- Reduce spread of cockroaches and other insects by keeping food in limited space, in kitchen
- Eliminate tobacco smoke from the home, including smoking of others, and even clothing with embedded smoke
- Avoid air pollution, industrial dust and fumes

Complications of Asthma: Many people with asthma find that symptoms improve over time with reduced frequency of asthma attacks. However, there are potentially serious complications that may develop:

- Decreased ability to carry out activities of daily living including exercise
- Impact on sleep due to attacks at night time
- Long term reduction in lung function
- Persistent cough
- Difficulty breathing, requiring use of a ventilator
- Death

Socio-Demographics of Asthma in Virginia

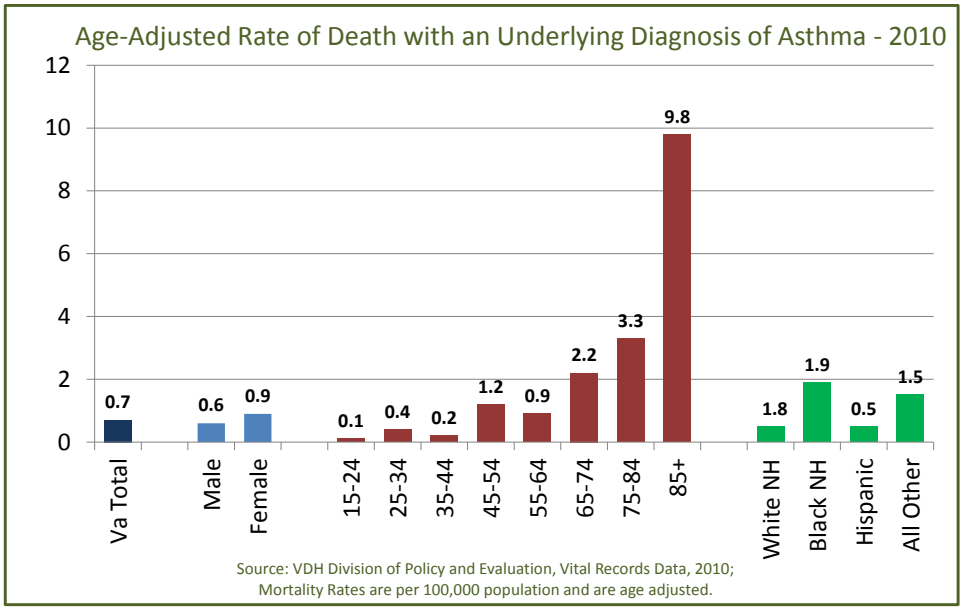
- **Gender:** asthma affects women significantly more than it affects men.
- **Age:** The distribution of asthma is bimodal, with a peak in the under 18 population (data not shown) continuing through age 24 and another smaller peak in middle age (55-64), declining post 65.
- **Race:** multiracial populations suffer from higher rates of asthma compared with other racial groups.



- **Income Level: the least** affluent populations, those earning under $15,000, have higher asthma rates than other income groups.
- **Education Level:** those who have not graduated from high school have higher prevalence rates than other populations.
- **Region:** Central and Southwestern Virginia have slightly higher prevalence rates compared with other regions.

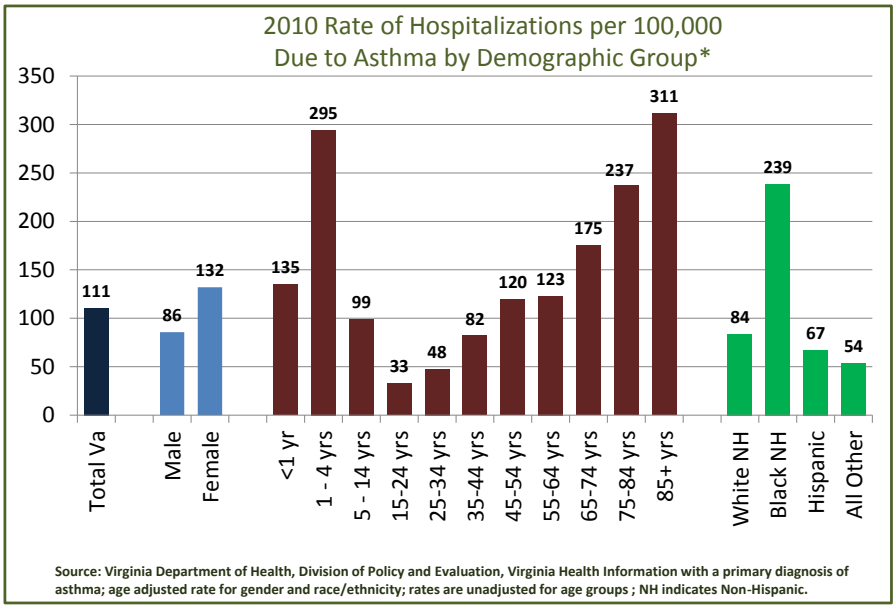
Mortality from Asthma in Virginia

- **Gender:** mortality rates from asthma are slightly higher among females as compared with males.
- **Age:** death rates increase significantly with age, with the 85 and over population showing far greater death rates compared with younger age groups.
- **Race:** non-Hispanic Blacks and All other races have higher mortality rates than Non-Hispanic whites**.**



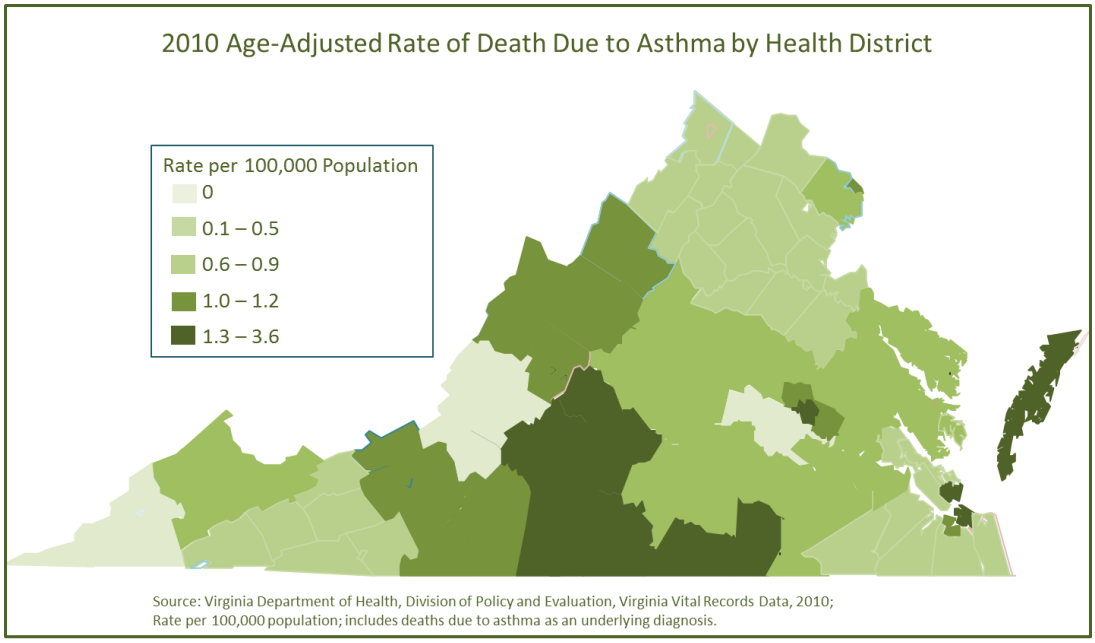
Morbidity – Virginia Hospitalization Rates

- **Gender:** hospitalization rates among females are over 50% higher, reflecting the higher prevalence among women.
- **Age**: hospitalization rates follow a bimodal distribution with a peake in the under 1 year and 1 – 4 year age group, and a second peak starting in the 45-54 age group and increasing steadily across all remaining age groups.
- **Race:** non-Hispanic Blacks have a significantly higher hospitalization rate compared with any other racial group.

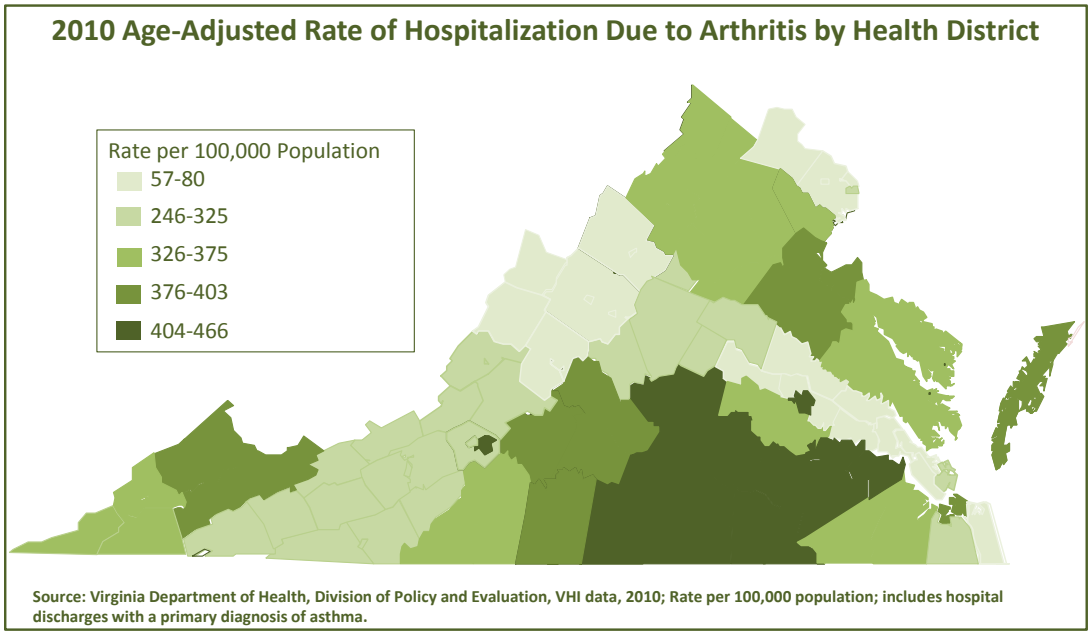


Regionality of Asthma in Virginia

- **Death Rate:** South-Central and far eastern Virginia show the highest mortality rate due to asthma, followed by some of the Shenandoah Valley; several Virginia cities, including Newport News, Hampton, Portsmouth and Richmond also show higher death rates due to asthma.



- **Hospitalization Rate:** South-Central Virginia has the highest inpatient hospitalization rates in Virginia; several of Virginia's major cities also show high hospitalization rates including Richmond, Roanoke, Portsmouth and Newport News.



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