

Chronic Lower Respiratory Diseases

Chronic lower respiratory diseases (CLRD) are a diverse group of disorders; most involve impairment of lung function.¹ CLRD comprises three major diseases: chronic bronchitis, emphysema, and asthma. These conditions are all characterized by shortness of breath caused by airway obstruction. The obstruction is irreversible in chronic bronchitis and emphysema, but it is reversible in asthma. Other diseases considered CLRD include cystic fibrosis, bronchiectasis, pneumoconioses, and sleep apnea. Before 1999, CLRD was called chronic obstructive pulmonary disease (COPD), but that terminology was imprecise and could refer to patients with chronic bronchitis or emphysema, or to a subset of pa-

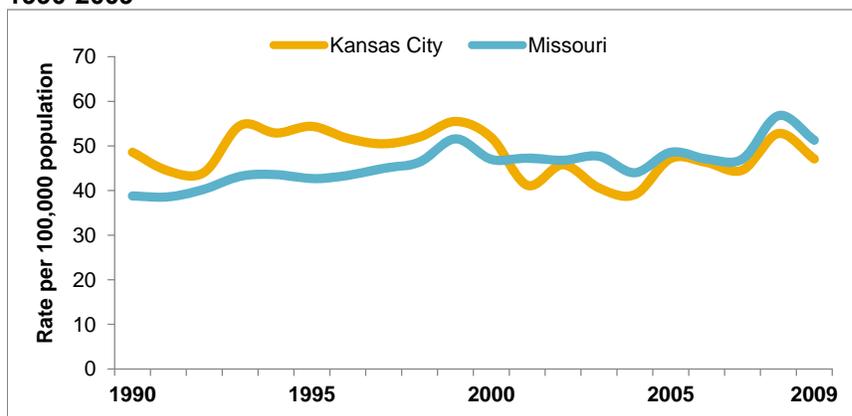
tients with asthma. Although CLRD accounted for only 5.6% of all deaths nationally in 2009, it was the 3rd leading overall cause of death.² In Kansas City, CLRD was the 3rd leading cause of death (4th among men, 3rd among women).

The primary consequence of CLRD that contributes to illness is breathlessness. Deaths generally occur among the older age groups, with more than 80% of CLRD deaths in Kansas City being among persons aged 65 years or more (Table 11.1). In 2009, the average age of death from CLRD among Kansas City residents was 73.7 years, and the median age at death was 77.0 years. The age-adjusted death rates due to CLRD in Missouri and

Table 11.1. Deaths from chronic lower respiratory disease by age and race/ethnicity, Kansas City, MO, 2005-2009

	Age-group										Total
	1-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	≥85	Not listed	
White, non-Hispanic	1	0	1	2	38	99	190	323	215	1	870
Black, non-Hispanic	3	3	2	5	16	28	52	64	32	0	205
Hispanic	0	0	0	0	1	0	3	5	2	0	11
Asian	0	0	0	0	0	0	1	0	1	0	2
Native American	0	0	0	0	1	0	0	2	1	0	4
Other/not listed	0	0	0	0	1	1	0	1	0	0	3
Total	4	3	3	7	57	128	246	395	251	1	1,095

Figure 11.1. Age-adjusted death rates per 100,000 population due to chronic lower respiratory diseases, Missouri and Kansas City, 1990-2009



Kansas City have become more similar in recent years with Kansas City's rate being slightly lower (Figure 11.1). In 2009, 1 death was due to bronchitis, 11 deaths were due to emphysema, 12 deaths were due to asthma, and 201 deaths were due to other chronic lower respiratory diseases.

CLRD is the 3rd leading cause of death among non-Hispanic whites in Kansas City and the 5th leading cause of death among non-Hispanic

Figure 11.2. Age-adjusted death rates by race due to chronic lower respiratory disease, Kansas City, MO, 1990-2009

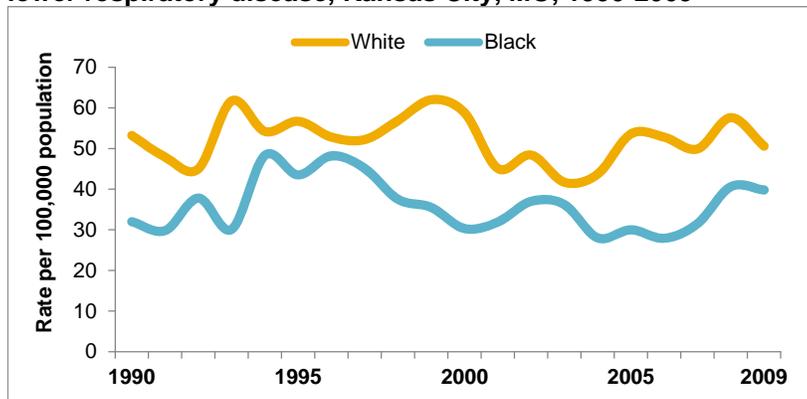
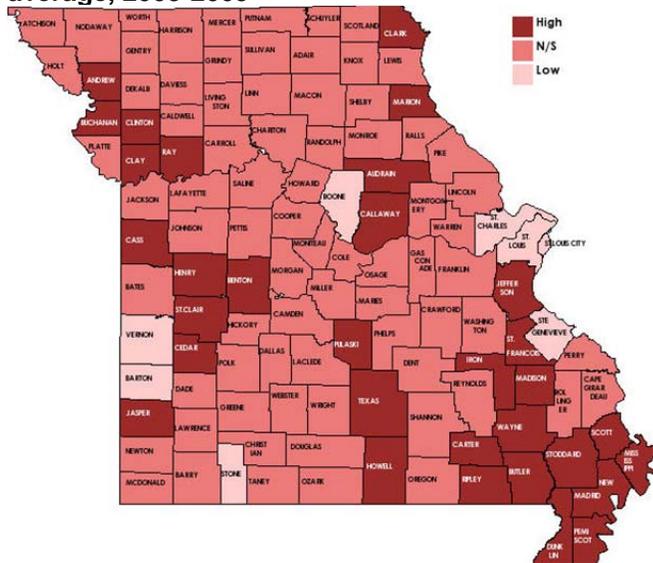


Figure 11.3. Age-adjusted death rates for chronic lower respiratory diseases compared to Missouri average, 2005-2009



(source: Missouri Department of Health and Senior Services)

blacks. The age-adjusted death rate for non-Hispanic whites is higher than the age-adjusted death rate for non-Hispanic blacks, and the disparity ratio in age-adjusted death rates between these groups has remained essentially unchanged since 1991 (Figure 11.2).³ Of the counties in which Kansas City is located, only Clay County had a higher age-adjusted death rate for CLRD than the statewide

average (Figure 11.3).

According to the 2006 National Health Interview Survey (NHIS), 2% of U.S. adults aged 18 years or more had been diagnosed with emphysema, 4% had been diagnosed with chronic bronchitis, and 11% had been diagnosed with asthma.⁴ Men were more likely to be diagnosed with emphysema while women were more likely to be diagnosed with asthma or chronic bronchitis. Adults in families of lower socioeconomic status had higher prevalence rates of emphysema, asthma, and chronic bronchitis than

adults in families of higher socioeconomic status. Emphysema, asthma, and chronic bronchitis were more common among persons aged 65 years or more who were insured by Medicaid or Medicare than those with only private health insurance. The likelihood of having a diagnosis of emphysema or chronic bronchitis declined with an increase in the level of educational attainment.

Depending on the severity, breathlessness may result in restrictions, ranging from inability to climb stairs to constant breathlessness and difficulty sleeping. Impaired lung function probably contributes to more frequent, severe, and prolonged viral and bacterial respiratory infections. The term COPD is frequently used when the lung function changes are largely irreversible and progressive. This occurs among older individuals who often have multiple chronic diseases which contribute to the overall disability. Approximately, 80% of persons with COPD are in this diseased state as a result of smoking.⁵

Exposure to ozone and particulate matter with an aerodynamic diameter at most 10 µm (PM₁₀) is associated with respiratory hospital admissions including CLRD.⁶ In Kansas City in 2008, CLRD was responsible for 2,349 visits to emergency departments and 1,059 hospitalizations.

CHRONIC LOWER RESPIRATORY DISEASES

Asthma

The word asthma comes from the Greek, *aazein*, which translates as “to breathe with open mouth or to pant”. It first appeared in Homer’s *Iliad* meaning short of breath, and probably was first used in a medical sense by Hippocrates. Today the emerging general consensus is that asthma is unlikely to be a single disease, but rather a clinical manifestation of several distinct diseases.⁷ People with asthma have extra sensitive or hyper-responsive airways that react by narrowing or obstructing when they become irritated. Narrowing or obstruction is caused by airway inflammation and bronchoconstriction and results in wheezing, coughing, shortness of breath, and/or chest tightness.

Two factors provoke asthma: triggers which

result in bronchoconstriction and inducers which result in inflammation of the airways. Common triggers of bronchoconstriction include everyday stimuli such as cold air, dust, strong fumes, exercise, inhaled irritants, emotional upsets, and smoke. Secondhand smoke has been shown to aggravate asthma symptoms, especially in children. In contrast to triggers, inducers cause both airway inflammation and airway hyper-responsiveness. These result in symptoms which may last longer, are delayed, and less easily reversible than those caused by triggers. The most common inducers are allergens and respiratory viral infections. About 60% of persons with asthma suffer from allergic asthma.

Prevalence

According to NHIS data, 8.5% of the U.S. population has asthma.⁸ Among adults, approximately 50% who were diagnosed with asthma as children no longer have the condition with about half becoming totally symptom free.⁹ Conversely, about 25% of childhood asthma cases persist with a similar degree of severity into adulthood. The remaining 25% may experience temporary cessation in symptoms, but may have symptoms return in adulthood.¹⁰ There is an age shift in the prevalence of asthma with it being more common in young boys, but having a higher prevalence among adult women. Asthma is the 2nd most costly medical treatment for children younger than 18 years-old at \$8 billion per year.¹¹ It is estimated that asthma resulted in the loss of 14.2 million work days and 10.5 million school days.

Asthma is more prevalent among blacks and the difference in prevalence between blacks and whites is greater for children than for adults.¹² Blacks are also associated with worse asthma outcomes. This includes a greater risk of emergency depart-

ment visits and hospitalizations, even in health care settings that provide uniform access to care.¹³ Black and Hispanic children who come from low-income families receive care for their asthma from emergency departments more often than children from higher income families.^{14 15} Important differences exist in charges incurred by children with asthma based on patient and hospital characteristics.¹⁶ Medical expenses are lower for non-children’s hospitals, higher for minority children, and higher for children on Medicaid. In Missouri, children on Medicaid have higher rates of emergency department use and costs than children covered by private insurance.¹⁷

Asthma is more prevalent among persons living below the federal poverty level than those at or above the federal poverty level.¹⁸ It is higher in the Midwest than the South or West, but lower than that in the Northeast. There is an association between obesity and asthma that is stronger among women than it is in men; this association holds for most racial and ethnic subgroups.¹⁹ A child’s birthweight and gestational age may influence his/her risk of

developing asthma, with increasing risk as birth-weight or gestational age declines.^{20 21} In addition, preterm pregnancies complicated by chorioamnionitis are associated with increased risk of asthma in early childhood. It has also been suggested that this infection could explain much of the racial disparity

observed in asthma.²² Neighborhood characteristics are strong predictors of childhood asthma. This may be related to factors such as proximity to pollutant-producing factories nearby or cockroach allergens in the home environment.^{23 24}

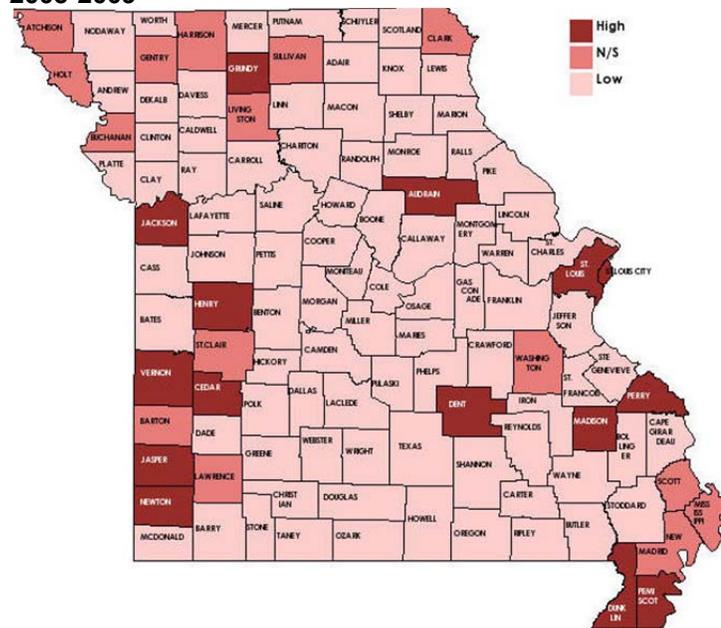
Missouri & Kansas City

The Missouri Behavioral Risk Factor Surveillance System found that 9.5% of adults and about 10% of children younger than 18 years-old had asthma. The prevalence of current asthma was highest in the eastern half of the state. It is estimated that 400,000 adults and 150,000 children in the state are currently living with asthma (www.dhss.mo.gov/asthma). Among adults, 7.5% were told by their health care provider that their asthma was work-related. Among adults with asthma, 28.4% were current smokers (compared to 26% for persons without asthma) and regular exposure to second-hand smoke was common.²⁵ Of the asthmat-

ic current smokers who had visited a physician in the past 12 months, 30% were not advised to quit smoking.

The Asthma and Allergy Foundation of America ranks metropolitan areas as Asthma Capitals. Its 2009 report ranked Kansas City 79th (average), while St Louis City ranked 1st, the worst in the nation (www.aafa.org). The counties in which Kansas City is situated have an age-adjusted asthma prevalence rate that is intermediate when compared to other Missouri counties (Figure 11.4). A 2004 telephone survey commissioned by the Kansas City Health Department found a 12.5% prevalence for asthma among respondents.²⁶ Data from the 2007 Behavioral Risk Factor Surveillance Survey (BRFSS) found that 8.2% of adults in the bi-state metropolitan area currently had asthma.²⁷

Figure 11.4. Age-adjusted rates for emergency department visits for asthma compared to Missouri average, 2005-2009



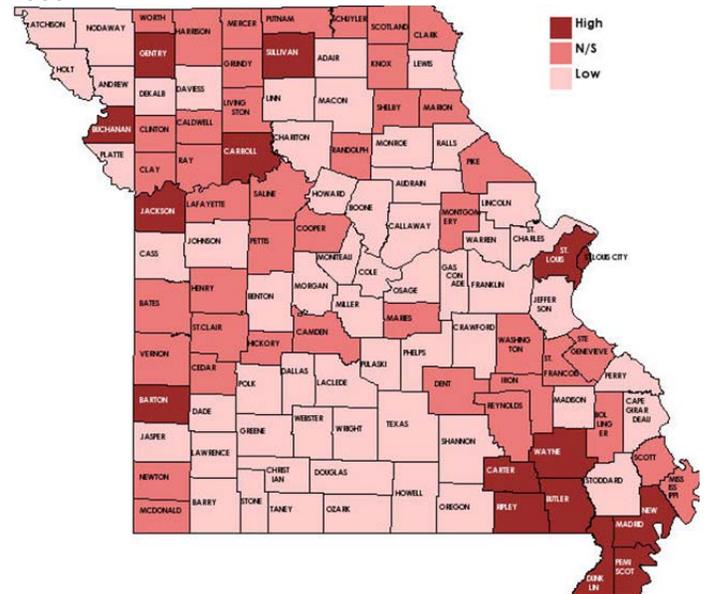
(source: Missouri Department of Health and Senior Services)

Of the counties in which Kansas City is located, Jackson County had significantly higher age-adjusted rates for emergency department and hospital utilizations resulting from asthma than the statewide averages (Figures 11.4 and 11.5). In 2009, there were 3,803 emergency department visits by Kansas City residents because of asthma and 899 hospitalizations. It was the 8th leading reason for non-Hispanic blacks to visit an emergency room and the 10th leading reason for hospitalization.

Asthma-related emergency department visits and hospitalizations peak in Kansas City during May and October each year. The specific causes for these peaks are not known, although Canadian researchers believe the fall peak in their country is driven by

kids, colds, and the return to school.²⁸ Data reported by Children’s Mercy Hospital at the 2006 annual meeting of the American College of Allergy, Asthma and Immunology suggested that rising temperatures are causing earlier pollen seasons in Kansas City which, in turn, could affect asthmatic individuals who are sensitive to spring pollens.

Figure 11.5. Age-adjusted rates for hospitalizations due to asthma compared with Missouri average, 2005-2009



(source: Missouri Department of Health and Senior Services)

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