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Geographic and racial variation in asthma prevalence and emergency department use among Medicaid-enrolled children in 14 southern states

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Abstract

Background—Despite evidence-based prevention and practice guidelines, asthma prevalence, treatment, and outcomes vary widely at individual and community levels. Asthma disproportionate/ly affects low-income and minority children, who comprise a large segment of the Medicaid population.

Methods—2007 Medicaid claims data from 14 southern states was mapped for 556 counties to describe the local area variation in 1-year asthma prevalence rates, emergency department (ED) visit rates, and racial disparity rate ratios.

Results—One-year period prevalence of asthma ranged from 2.8% in Florida to 6.4% in Alabama, with a median prevalence rate of 4.1%. At the county level, the prevalence was higher for Black children and ranged from 1.03% in Manatee County, FL, to 21.0% in Hockley County,

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Declaration of interest

The authors report no conflicts of interest.

Author Contributions: Drs. Malhotra, Baltrus, Zhang, and Rust had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Drs. Immergluck and McRoy had access to all analytical output and were involved in interpretation of results in the context of other published research in this area.

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Analysis and interpretation of data: Malhotra, Baltrus, Zhang, and Rust.

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TX. Black–White rate ratios of prevalence ranged from 0.49 in LeFlore County, MS, to 3.87 in Flagler County, FL. Adjusted asthma ED visit rates ranged from 2.2 per 1000 children in Maryland to 16.5 in Alabama, with a median Black–White ED-visit rate ratio of 2.4. Rates were higher for Black children, ranging from 0.80 per 1000 in Wicomico County, MD, to 70 per 1000 in DeSoto County, FL. Rate ratios of ED visits ranged from 0.25 in Vernon Parish, LA, to 25.28 in Nelson County, KY.

Conclusions and relevance—Low-income children with Medicaid coverage still experience substantial variation in asthma prevalence and outcomes from one community to another. The pattern of worse outcomes for Black children also varies widely across counties. Eliminating this variation could substantially improve overall outcomes and eliminate asthma disparities.

Keywords

Asthma; health disparities; local-area variation

Introduction

Asthma is the most common chronic disease among children. It affects 10.5 million US children and disproportionately affects minority children and children from low income families [1,2]. Across all age groups, asthma accounted for 3404 deaths, 439 400 hospitalizations, and 1.8 million emergency department (ED) visits in 2010 [3] with higher ED visits and hospitalizations among children compared to adults [4]. In 2007, the estimated costs of asthma were \$56 billion [5]. Medicaid bears a large part of these costs, as more than half of asthma-related hospitalizations in childhood are billed to Medicaid [6]. Non-medical factors such as social determinants [7] and air quality are associated with population-level asthma prevalence and outcomes [8], while evidence-based guidelines for self-management and treatment could potentially reduce asthma exacerbations and outcomes such as missed school days, healthcare utilization, and deaths [9].

Although risk factors are well known, and evidence-based prevention and treatment guidelines have been widely disseminated, there appears to be substantial variation in prevalence, treatment, and outcomes of childhood asthma. Variation occurs not only from patient-to-patient, but across practices, neighborhoods, and racial-ethnic groups. Boys (15%) are more likely to be diagnosed with asthma than girls (13%) [1]. Puerto Rican children have higher asthma prevalence (16.1%) than those of Mexican descent (5.4%). African American or non-Hispanic Black children have twice the prevalence of asthma (16%) as non-Hispanic White children (8%) [3]. Asthma-related hospitalization and mortality rates are three times higher among Black children than White children [2]. Asthma prevalence rates are higher in urban regions than in rural areas [10].

Variation in processes and outcomes are a key metric in the quality improvement literature as a measure of potential room for improvement in outcomes. The gap between average and best-practice benchmark outcomes is a measure of potential gains which could be achieved in moving our nation toward optimal and equitable health outcomes for all children.

The south is an area of special concern to public health in the United States, as it is a region with some of the worst health outcomes [11]. Counties in southern states consistently rank poorly on several chronic disease indicators such as obesity, diabetes, and breast cancer. The South also has a greater share of the African American population in the US [12], and high racial disparities in health outcomes [13].

Medicaid provides health insurance to 43 million low-income children across the country [14], and presents a unique opportunity to study children who are similarly poor socioeconomically by virtue of meeting Medicaid income and asset eligibility rules, and who are similarly insured in having coverage for the same providers, medications, and scope of services within any given state. This would seem to eliminate many explanatory factors in variation of treatment and outcomes, and residual variation could potentially be targeted for intervention. In addition, a high level of variation in racial disparities, with some communities achieving racial equality, might underscore the fact that racial disparities in asthma are not inevitable. Positive deviance counties (those demonstrating low rates and high equality) might also suggest a path toward more optimal and equitable asthma outcomes for all children. Therefore, we undertook this study to quantify and map the local area variation in disparities in asthma prevalence and ED visits among Medicaid-enrolled children in 14 southern states.

Methods

This retrospective study focused on county level geographic variation in prevalence rates, ED visit rates, and Black–White disparity rate ratios for Black and White Medicaid-enrolled children with asthma in 2007 in 14 southern states.

Data sources

Childhood asthma data—We analyzed 2007 Medicaid claims data covering 14 southern states – Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Missouri, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia (abbreviated as AL, AR, FL, GA, KY, LA, MD, MO, MS, NC, SC, TN, TX, and VA), for county level geographic variation in prevalence rates, ED visit rates, and Black–White disparity rate ratios. Data were obtained from the Center for Medicare and Medicaid Services (CMS) in a standard Medicaid Analytic eXtract (MAX) file format with records for enrollee demographics, Medicaid eligibility, service utilization, prescription drugs, and payments. We used the MAX inpatient file, outpatient/other file, and personal summary files. There were 190 026 5–12 year old children with an asthma diagnosis for at least one inpatient admission or at least two encounters on different dates in the outpatient file (ICD-9 code: 493.xx, excluding 493.2x).

Variables and measures—State and county wide prevalence of asthma, rates of ED visits, and Black–White ED-visit rate ratios were our main outcome variables.

Prevalence of asthma—The prevalence of asthma was calculated by dividing the count of Medicaid-enrolled children aged 5–12 diagnosed with asthma by criteria defined above, by the total number of children aged 5–12 years old in the Medicaid population for each

county, which was extracted from the Medicaid Claims data personal summary file. The prevalence rate of asthma was calculated for each county for all children on Medicaid and separately for Black and White children.

Race and ethnicity are combined as one variable in the Medicaid MAX-file datasets, and so “Black” refers to children who at the time of enrollment were categorized as African American or Black and not Hispanic. For the sake of readability, we refer to African American or Black, Non-Hispanic children simply as Black children in this paper. “White” refers to children who at the time of enrollment were categorized as White and not Hispanic, and are listed simply as White children in this paper.

ED visits—ED visits were transformed into a rate per time and then annualized depending on the length of enrollment in Medicaid. For those Medicaid beneficiaries seen in the ED, but not admitted to the hospital, services were identified in the Outpatient/Other Services file, using revenue center codes 0450–0459 and 0981. Those who were seen in the ED and then admitted to the hospital were identified from the Inpatient file, using the revenue center codes of 0450–0459 and 0981. Other charges associated with ED services were identified in the Inpatient file by place of service. We found ED visits in both inpatient and outpatient files. We categorized the ED visit variable as dichotomous (yes/no) and summarized the ED visit counts in a specific county by racial-ethnic group. ED visit rate for each race group in a county was obtained by dividing ED visit count by the number of children in each race group in each county with at least 11 children with asthma in each race group to produce stable rates and rate ratios and to protect confidentiality within our data use agreement restrictions. Black/White ED visit rate ratio was calculated by dividing the rate of ED visits among Black children by the rate of ED visits among White children.

Analysis

Geographic data were obtained at the county level in the form of a shapefile from the US Census Bureau [15]. The county shapefile was merged with data on other variables using the 5-digit FIPS codes and georeferenced using the North America Albers Equal Area Conic projection system. Data manipulation and analyses were performed using ArcGIS for Desktop 10.1 [16]. All data were symbolized at the county level using choropleth (color coded) maps using the quantile classification scheme.

Geographic sample—The study included 14 southern states, for which we procured 100% of Medicaid claims data for patient activity occurring in the calendar year 2007. These states had 1402 counties in 2010. Due to differences in county definitions between the Medicaid data files and census shapefiles, we were able to uniquely link 1390 counties. To protect confidentiality, the 556 counties with at least 11 Black and 11 White children with asthma were mapped. The remaining 834, with less than 11 children with asthma in either race category, were excluded from the analysis. Between-group differences in rates were compared using quintile cutoffs from the overall population. Clusters of counties with high and low rates were estimated using the Local Moran’s I statistic and the cluster analysis tool in ArcGIS 10.2 [17]. Incremental spatial autocorrelation was used to determine the appropriate distance bands for the cluster analysis [18].

Results

Within the 556 counties, the mean number of children enrolled in Medicaid was 6555 (with a minimum of 277 children enrolled in Hyde County, NC, and a maximum of 174 988 in Harris County, TX). Of these, a total of 155 128 children had a diagnosis of asthma, with a mean age of 7.88 years (SD 2.8) and a mean of 11.05 months in 2007 of Medicaid eligibility (SD 2.1); 60% children were male, 45.0% were Black, 25.5% White, 21.0% Hispanic, and 8.5% other races.

Statewide variation in asthma prevalence in Medicaid

The prevalence of asthma was higher for Black children in all states. Overall, AL had the highest prevalence of asthma and FL had the lowest. For both Black and White children, prevalence was highest in AL and lowest in FL (Table 1). Almost all counties in AL had high overall prevalence rates and high prevalence rates for both Black and White children, compared to other states. That is, 31 out of the 39 mapped counties in AL had prevalence rates in the top two quintiles out of all counties in the 14 state regions, for overall prevalence. Thirty-three counties out of 39 for Black children, and 30 counties out of 39 for White children were in the top two quintiles of this same 14-state region for prevalence (Figure 1, panel 4).

County level variation in asthma prevalence in Medicaid

At the county level, there was substantial variation in the prevalence of asthma among 5–12 year old Medicaid-enrolled children. Pike County, AL, had the highest overall prevalence rate at 18.4% and Manatee County, FL, had the lowest overall rate at 1.2%. Prevalence rates ranged from 1.03% in Manatee County, FL, to 20.97% in Hockley County, TX, for Black children and from 1.06% in Manatee County, FL, to 16.46% in Pike County, AL, for White children.

The Black–White prevalence rate ratio, which is the ratio of asthma prevalence for Black children to the ratio of asthma prevalence for White children, ranged from 0.49 in LeFlore County, MS, to 3.87 in Flagler County, FL. Of all 556 counties included in the analysis, only 56 had a rate ratio less than one. Among these 56 counties, 12 counties had prevalence rates in the lowest quintile of all counties in the 14 states for both Black and White children.

Geographic clustering in asthma prevalence

Statistically significant geographic clusters of high prevalence rates (defined as localized groups of counties with higher observed prevalence rates than expected) were detected in AL and NC, ($p < 0.05$). Similarly, statistically significant geographic clusters of low prevalence rates (defined as localized groups of counties with lower observed prevalence rates than expected) were detected in GA and FL ($p < 0.05$). When stratified by race, high prevalence rate clusters for both races were detected in AL, NC, and TX ($p < 0.05$) and low prevalence rate clusters in GA and FL ($p < 0.05$).

Statewide variation in asthma ED visit rates in Medicaid

ED visits were calculated per 1000 children per year adjusted for months enrolled in Medicaid. In all states, ED visit rates were higher for Black children compared to White children (Table 2).

Overall, AL had the highest ED visit rates and MD had the lowest (Table 2). There was little variation in ED visit rates within counties in both AL and MD, compared with other states, in the sense that AL counties showed mostly high rates and most MD counties had low rates. Within AL, 21 out of 39 mapped counties were in the highest quintile of all counties in the 14 southern states for overall ED visits.

ED visit rates were highest for Black children in TX. Forty-eight out of 67 counties in TX had ED visit rates in the highest quintile for Black children (Figure 2, panel 3). ED visit rates were highest for White children in TX as well, but only 14 out of 62 counties in TX were in the highest quintile (Figure 2, panel 4). For both Black and White children, the lowest ED visit rates were in MD (Table 2).

County level variation in asthma ED visit rates in Medicaid

At the county level, Frederick County, MD had the lowest overall ED visit rate of 0.62 visits per 1000 children, while Bell County, TX had the highest overall rate of 50.91 visits per 1000 children.

For Black children, DeSoto County, FL, had the highest ED visit rate (70 per 1000 children) whereas Wicomico County, MD, had the lowest ED visit rate (0.80 per 1000 children). For White children, Bell County, TX, had the highest ED visit rate (46.47 per 1000 children) and Washington County, MD, had the lowest rate (0.27 per 1000 children).

Black–White rate ratios of ED visits, defined as the ratio of the ED visit rate for Black children to the ED visit rate for White children, ranged from 0.25 in Vernon Parish, LA, to 25.28 in Nelson County, KY. A total of 68 counties had ED visit rate ratios commensurate with no racial disparities, e.g. rate ratio less than or equal to one. Of these 68 counties, 26 were in the bottom quintile of all counties in the region for ED visit rates for both Black and White children, suggesting communities that had achieved both optimal and equitable asthma ED visit rates for all Medicaid children of both racial groups.

Geographic clustering in asthma ED visit rates

Statistically significant geographic clusters of high overall ED visit rates (defined as localized groups of counties with higher observed ED visit rates than expected) were detected in AL, MS, and TX ($p < 0.05$). Statistically significant geographic clusters of low overall ED visit rates (defined as localized groups of counties with lower observed ED visit rates than expected) were detected in MD and FL ($p < 0.05$).

When stratified by race, clusters of high ED visit rates were detected in TX ($p < 0.05$), and clusters of low ED visit rates in FL and MD ($p < 0.05$) for Black children. For White children, clusters of high ED visit rates were detected in TX, MS, and AL ($p < 0.05$) and clusters of low ED visit rates were detected in FL, NC, and MD ($p < 0.05$).

Discussion

Our data show much local area variation in asthma prevalence and asthma ED visit rates among Medicaid-enrolled children; between Black and White children, more counties had higher prevalence of asthma and higher ED visit rates among Black than White children. Black–White disparities also show substantial geographic variation across this region, including even counties where both prevalence and ED visit rates were lower for Black children than for White children. There are three key implications of these findings:

1. Variation suggests an opportunity for improvement, if the causes of variation can be understood and if interventions can be designed to effectively reduce the variation.
2. Racial equality is achievable, at least in this specific subgroup of low-income children enrolled in Medicaid. Disparities are not inevitable.
3. The “positive-deviance” communities that have achieved optimal and equal prevalence and adverse event rates may show us a path toward health equity if specific factors can be identified to differentiate these from high-disparity communities.

Understanding factors leading to lower disparities in these counties could provide models which could be replicated to narrow the disparities in asthma rates between Black and White children.

The first challenge is to understand local-area variation in prevalence. Previous studies have documented potential explanatory variables at many levels. Outdoor air quality in suburban and urban areas is linked to overall traffic density, as well as diesel pollution from large trucks and buses [19]. Decreased motor vehicle traffic congestion during the 1996 Olympics in Atlanta was linked to lower rates of asthma-related healthcare utilization across all insured children. Among Medicaid-enrolled children, ED visits and hospitalizations decreased by 41.6% [20]. Proximity to interstate highways has also been associated with higher prevalence of asthma and higher exacerbation rates [21,22].

School policies can also impact childhood asthma rates and drive local-area variation. Increased accessibility to bronchodilators during the school day [23] increased numbers of school based clinics [24,25], and effective efforts to stop “engine idling” of automobiles and school buses have all been associated with reduced childhood asthma morbidity [26].

Air quality factors (such as proximity to coal-fired electricity-generating power plants) vary significantly across the south. Power plants and weather patterns affect local-area variation in particulate-matter and nitrogen or sulfur components of air pollution [27]. There may also be local-area variation in exposure to farm dust, tree, grass, and other plant allergens in rural areas. Different farming techniques may affect soil erosion and dust exposure. The risk of having asthma from exposure to farm chemicals has also been documented [28].

Variation in indoor air quality is a significant issue, especially in poor residential areas and public housing. Cockroach antigen, dust, poor air filtration in ventilation systems, indoor pesticide use and mold have all been associated with increased risk of childhood asthma

[8,29–31] leading to more unscheduled visits to healthcare providers. These are factors over which poor tenants may have little control. Higher prevalence rates of asthma and more frequent adverse events ranging from ED visits to hospital admissions and even deaths are associated with broader social determinants and neighborhood deprivation. Residential variation affects distribution of asthma prevalence in that risk of asthma is determined by socioeconomic status and exposure to stress from poverty, violence, and neighborhood disadvantage, specifically, poor housing and overcrowding [7].

Within the population of children diagnosed with asthma, there are also substantial racial-ethnic disparities in treatment, control, and adverse outcomes. The National Asthma Education and Prevention Program guidelines (NAEPP) [32] provides an extensive review of the literature on the relationship between racial-ethnic differences in treatment with long-term controller medications, as well as in self-management behaviors, as a partial attempt to explain asthma outcome disparities. These patterns are also subject to local-area variation.

However, within the Medicaid population, there are less racial-ethnic disparities in part because income eligibility criteria assure that children of all racial-ethnic groups are similarly poor, and similarly insured with the same provider panels, scope of coverage, payment rates, and drug formularies within each state, which makes the local-area variation even more curious.

Variation in treatment access and quality can also affect variation in ED visits, even within the subpopulation of children insured by Medicaid. For example, children with the same Medicaid card in the same city may have different levels of access to care because of the location of Medicaid providers or the availability of public transportation to reach these practices [33]. Hispanic or Latino children may have differential access to care even with the same provider network, because of the low availability of linguistically or culturally competent providers [34]. There is substantial variation in quality of care, especially in the prescribing of long-term controller medications such as inhaled corticosteroids. The problem of under-staging, under-prescribing, and clinical inertia in maintaining inadequate levels of long-term control treatment, have been well-documented in the asthma quality of care literature [35,36]. Therefore, ED visit rates may at times be a reflection of both access to care (inadequate alternatives to going to the ED such as inadequate timely access to culturally relevant primary care) and severity of illness (asthma exacerbations leading to ED visits).

Variation in patient and family level behaviors can also drive local area variation. At the patient level, the use of written action plans for self-management and adherence to daily long-term controller medication use are reported to vary. A recent study, using the same 14-state Medicaid database, documented that only one in three children maintain even 3 months of adherence to inhaled corticosteroids after the initial prescription [37]. Higher levels of family efficacy and positive parenting are associated with improved self-management and control of asthma. These are enhanced by mobilizing community strengths and neighborhood-level resources, such as culturally synchronous parents serving as peer counselors [9]. Additionally, availability of comprehensive and culturally relevant primary care centers such as federally qualified community health centers are known to reduce ED

visit rates, particularly among the uninsured. While there may be a perception of overutilization of EDs by the poor, studies suggest that the greater problem may be underuse of primary care [38].

Limitations of this study are inherent in claims data. First, prevalence of asthma among Medicaid-enrolled children is highly influenced by the denominator of Medicaid enrollment rates, which can have county and state-level variation depending on outreach, application and retention processes, and other structural barriers to enrollment. In our study, prevalence is measured over the course of 1 year. Hence, our analyses may exclude children with mild or well-managed asthma, and rates may be lower compared with other reported prevalence rates. Prevalence rates were also not adjusted for locally varying factors such as comorbidities and frequency of doctor visits, which might have played a role in a child's probability of being diagnosed with asthma. There is also some state variation in the consistency of encounter-level data reporting such as ED visits in patients whose bills are paid by a managed care organization, which in turn is paid a monthly capitation rate by the state Medicaid program, even though reporting of encounter-level data has been a federal requirement since 1999. Although our inclusion methodology (two outpatient encounters with an asthma diagnosis or one inpatient hospital admission with an asthma diagnosis) is a validated approach in claims-based chronic disease research, we do acknowledge that some children with only one asthma OT-claim in a year may have been excluded, in order to assure that the children who were included were confirmed to have asthma. Lastly, in this study we also did not pursue the myriad of explanatory variables at the individual, family, neighborhood, and state levels. Our purpose was to document the amount of local-area and racial variation in prevalence and ED visit rates within the Medicaid population and our analyses did not seek to explain the local-area variation. This will be the subject of further research.

Conclusion

Both geographic variation and racial-ethnic variation suggest that there is great opportunity for improving population-level asthma health by eliminating this variation. Even in the current mix of widely varying prevalence and ED visit rates from county to county, there are counties that appear to have achieved decreased asthma adverse event rates for all segments of the population (e.g., low Black and White asthma ED visit rates and low Black-White rate ratios demonstrating relative racial equality in these measures). These data suggest the potential of state Medicaid programs to engage in asthma prevalence and adverse event surveillance to identify communities and sub-populations at higher risk. The ability to burrow down to the individual level and assess quality of care and patterns of healthcare utilization provide another mechanism for targeting interventions toward providers or patients when children are receiving low-quality (high-variance) care or are experiencing excess adverse events such as ED visits or hospital admissions. Eliminating variation in adverse events and achieving benchmarked achievable best-practice outcomes in each community is a clear path toward health equity, e.g., optimal and equitable health outcomes for all children with asthma.

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Figure 1.
Geographic variation in childhood asthma prevalence by race among Medicaid children in 14 southern states.

Figure 2.
Geographic variation in childhood asthma ED visits by race among Medicaid children in 14 southern states.

Table 1

State and county-level variation in childhood asthma prevalence.

State	Number of children with asthma (% of 14-state total)	Mean asthma prevalence by race (%)				Median county prevalence rate (%)	County asthma prevalence rate range (20–80%)
		Black	White	Total			
Alabama	9031 (6.0)	7.1	5.5	6.4		6.1	(4.5–8.1)
Arkansas	4599 (3.1)	5.1	3.1	4.0		3.6	(3.0–4.5)
Florida	14 742 (9.5)	2.5	1.9	2.8		2.7	(2.2–4.3)
Georgia	12 568 (8.3)	3.6	2.5	3.1		3.1	(2.4–4.0)
Kentucky	3369 (2.2)	5.3	3.8	4.5		4.6	(3.1–5.2)
Louisiana	12 459 (8.3)	4.9	4.2	4.7		4.1	(3.4–5.8)
Maryland	6787 (4.5)	4.2	3.0	3.9		3.6	(2.9–4.4)
Missouri	6194 (4.1)	5.4	3.7	4.5		3.7	(3.2–5.1)
Mississippi	3757 (2.5)	4.1	2.9	3.9		3.9	(2.8–4.8)
N. Carolina	17 369 (11.5)	5.7	3.7	4.7		4.5	(3.6–6.6)
S. Carolina	8882 (5.9)	5.4	4.4	5.0		4.9	(4.4–5.8)
Tennessee	6699 (4.4)	3.9	3.1	3.5		3.3	(2.8–4.4)
Texas	42 325 (28.0)	5.4	4.2	5.1		4.7	(3.6–5.8)
Virginia	6347 (4.2)	5.2	3.4	4.3		4.3	(3.5–5.4)
Total	155 128 (100)	4.6	3.5	4.3		4.1	(3.0–5.6)

Table 2

State and county-level variation in childhood asthma ED-visit rates.

Asthma ED visit rates by race (per 1000 children per year adjusted for months enrolled in Medicaid)									
States	Number of counties with sufficient sample size				Median county asthma ED visit rate	County asthma ED visit rate range (20–80%)	Median county ED-visit Black–White rate ratio	County ED-visit Black–White rate ratio range (20–80%)	
		Black	White	Total					
Alabama	39	21.8	9.0	16.5	14.8	9.2–20.2	2.1	1.5–3.2	
Arkansas	29	12.4	3.7	7.9	5.7	3.4–11.0	2.7	1.8–4.6	
Florida	42	7.7	4.5	6.1	7.5	4.6–9.0	2.0	1.5–4.0	
Georgia	66	13.3	5.8	10.0	8.8	5.9–11.7	2.7	1.5–3.8	
Kentucky	15	18.8	8.6	12.8	10.2	6.5–13.2	1.9	1.1–2.5	
Louisiana	51	15.5	5.9	11.5	10.3	7.4–12.8	2.5	1.5–3.3	
Maryland	19	2.6	1.3	2.2	1.9	1.1–2.7	2.1	0.2–3.0	
Missouri	19	18.5	8.0	13.8	10.3	7.1–14.0	2.5	2.0–3.2	
Mississippi	34	20.4	7.9	15.5	13.3	10.7–17.1	2.4	1.5–3.5	
N. Carolina	68	17.5	6.1	11.4	10.6	6.4–14.7	2.8	1.7–4.6	
S. Carolina	36	13.6	6.1	10.3	11.3	8.0–13.4	2.2	1.6–4.1	
Tennessee	29	12.1	6.4	9.5	6.3	4.1–11.5	2.2	1.1–4.5	
Texas	67	22.7	11.6	14.4	13.8	4.1–11.5	2.5	1.5–3.8	
Virginia	42	12.4	5.3	9.0	7.8	6.0–11.3	2.5	1.2–4.1	
Total	556	14.6	6.6	10.8	9.8	5.9–14.2	2.4	1.5–3.8	