

HEAT- RELATED ILLNESS IN REGION 2: CAPITAL AREA

Review of Emergency Department
Data from 2010–2020

September 2024

TABLE OF CONTENTS

Overview	<u>3</u>
Methods	<u>5</u>
Results	<u>7</u>
Annual counts and rates: All cases	<u>7</u>
Temperature	<u>8</u>
Month	<u>9</u>
Day	<u>9</u>
All counts and rates: Workers	<u>10</u>
Temperature	<u>11</u>
Month	<u>12</u>
Day	<u>12</u>
Age: All cases	<u>13</u>
Age: Workers	<u>13</u>
Sex: All cases	<u>14</u>
Race: All cases	<u>15</u>
Race by Sex: Workers	<u>15</u>
Hospital: All cases	<u>16</u>
Hospital: workers	<u>16</u>
Payer: All cases	<u>17</u>
Payer: Workers	<u>17</u>
Location: All cases	<u>18</u>
Location: Workers	<u>18</u>
Appendices	<u>19</u>



AUTHORS:

This report was prepared by the Louisiana Department of Health (LDH) Office of Public Health's (OPH) Occupational Heat-Related Illness Prevention Program and Tulane University School of Public Health/Disaster Management Program.

Daniel Veneracion, MPH

Brittany Babin, MPH

Ben Rundbaken, MPH student

ACKNOWLEDGEMENTS:

This work was partially funded by the Cooperative Agreement (U60OH010195: Occupational Health and Injury Surveillance in Louisiana) between LDH and the Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (CDC/NIOSH).

For more information about the report or the program, contact workerhealth@la.gov or visit ldh.la.gov/page/la-heat



OVERVIEW

This report summarizes information reported to the Louisiana Department of Health (LDH) Office of Public Health for Region 2 residents and visitors who were treated in the emergency department (ED) from 2010 to 2020 with a diagnosis indicating heat exposure. Region 2 encompasses seven parishes: Ascension, East Baton Rouge, East Feliciana, Iberville, Pointe Coupee, West Baton Rouge, and West Feliciana.

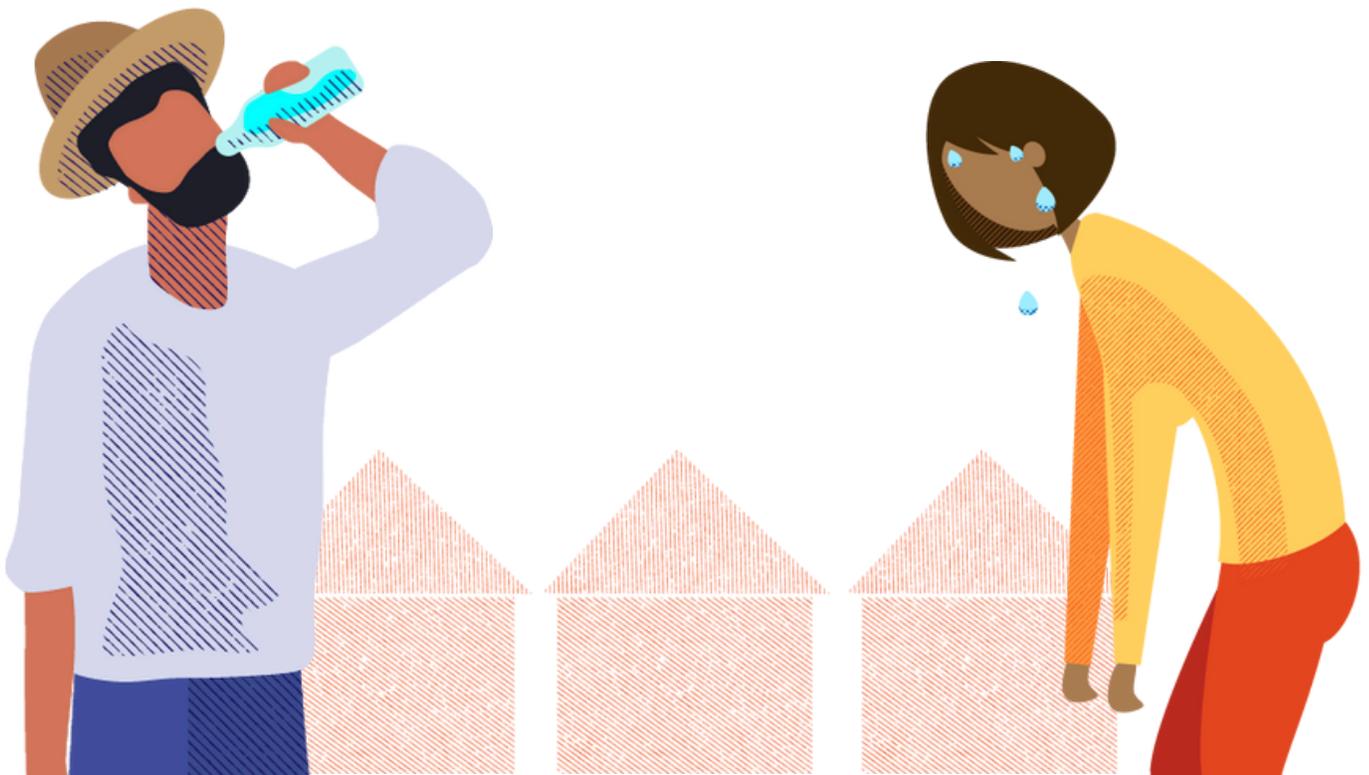
Heat exposure is intensifying as the frequency, severity, and duration of extreme heat events increases. These changes are of concern for Louisiana because the state experiences some of the highest average summer temperatures in the nation. Hot summers are compounded by high humidity which worsens the impact of heat by impairing the body's ability to cool by evaporation. **Understanding variations in heat-related ED visits can inform and target public education programs and policy and prevention efforts, such as heat-health alert protocols and action plans.**

The human body maintains an internal temperature within a very narrow range. **Heat-related illness can occur when someone is exposed to high temperatures and his or her body is unable to cool itself sufficiently through sweating.** Heat-related illness (or hyperthermia) is a broad term for conditions directly related to an increase in body temperature. These conditions occur along a continuum of severity ranging from mild cramps, swelling and rashes to potentially fatal heat exhaustion and heatstroke. Heat also has indirect health impacts: it can exacerbate chronic conditions such as respiratory, cardiovascular, and kidney disease, increase injuries and accidents, and strain mental health.



Anyone can develop heat-related illness, but some people are at greater risk.

- Workers in outdoor settings, and some indoor work settings without adequate climate-controlled environments.
- Infants and young children. They are sensitive to the effects of high temperatures and rely on others to control their environments.
- Pregnant women. They are under more bodily stress and are more likely to become dehydrated. Heat exposure can also contribute to premature birth, stillbirth, and lower infant birthweight.
- Older adults (65+). As people age, their sweat cooling mechanism becomes less efficient.
- People with chronic health conditions such as heart or kidney disease, breathing conditions, high blood pressure, diabetes, and obesity. Certain medications can also put people at risk because they interfere with their ability to thermoregulate.
- People who exercise outside.



METHODS

DATA SOURCES

Health Data

Data analyzed in this report are from ED billing records for hospitals, excluding the Veterans Affairs Hospital. The Louisiana Hospital Association provided data.

CASE SELECTION

- **Resident status:**
 - Region 2 Residents: This refers to patients who lived in Region 2 based on the address listed on their medical record and were treated in any ED in Louisiana. (Refer to Appendix A: Summary Table: Region 2 Resident Heat-Related Illness Data, 2010-2020).
 - Non-Region 2 Residents: This refers to people who did not live in Region 2 based on the address listed on their medical record but were treated in an ED located in Region 2. These people are included because heat-health safety plans need to consider individuals visiting and working in Region 2. (Refer to Appendix B: Summary Table: Non-Region 2 Resident Heat-Related Illness Data, 2010-2020).
- **Work-related:** This refers to people who were working when they developed heat-related illness. Cases were considered work-related if workers' compensation was the primary payer of the medical bill or the medical record contained a work-related diagnostic code (Refer to External Causes of Morbidity: Work-relatedness). (Refer to Appendix C: Summary Table: Workers Region 2 Resident Heat-Related Illness Data, 2010-2020).
- **Diagnosis:** Primary or secondary diagnosis directly indicating heat exposure. Diagnoses include those for heat-related stroke, exhaustion, syncope, cramps, fatigue, and edema (Refer to Diagnostic codes: Heat-Related Illness).
- **Time period:** Warm season: April through October, 2010-2020.

CALCULATIONS

Age-adjusted and crude rates were calculated to determine differences by year, sex, age, and race. Region 2 population estimates were obtained from the U.S. Census 2020 Population estimates. Worker population estimates were extrapolated and calculated using Census population estimates and American Community Survey data. Region 2 resident rates were adjusted to the U.S. 2000 standard population, while only crude rates were calculated for workers due to population estimate availability. Age-adjustment removes the influence of differing age distributions among groups, allowing for a more accurate comparison of rates.

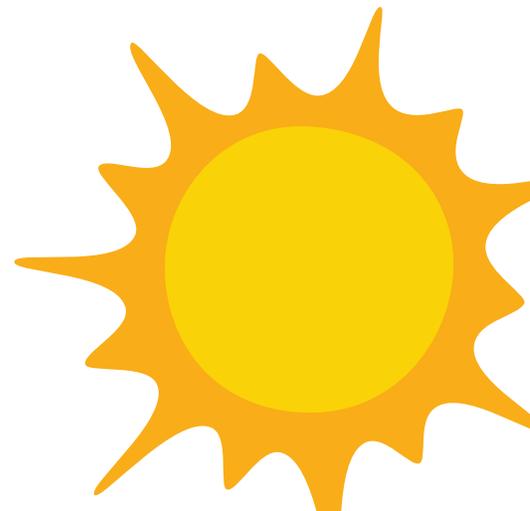
Non-Region 2 residents were included in counts by year, month, and day of the week but were excluded from age, sex, and race because the population estimates for these calculations only includes Region 2 residents.

LIMITATIONS

This report only includes information about individuals who had a diagnosis of heat-related illness listed on their medical record. This approach does not reflect the total burden of heat. Heat-related illness is underdiagnosed and underreported, and ascertainment can vary by time and place. In addition, heat can exacerbate chronic conditions, contribute to injuries such as a fall or trip, and have other indirect health impacts.

This report underestimates work-related cases. Many workers do not have workers' compensation insurance, they have workers' compensation but don't use it, or the healthcare provider doesn't record the case as work-related on the medical record.

This report may underestimate non-Region 2 residents who developed heat-related illness when they were visiting or working in Region 2, but received treatment in an ED not located in Region 2.



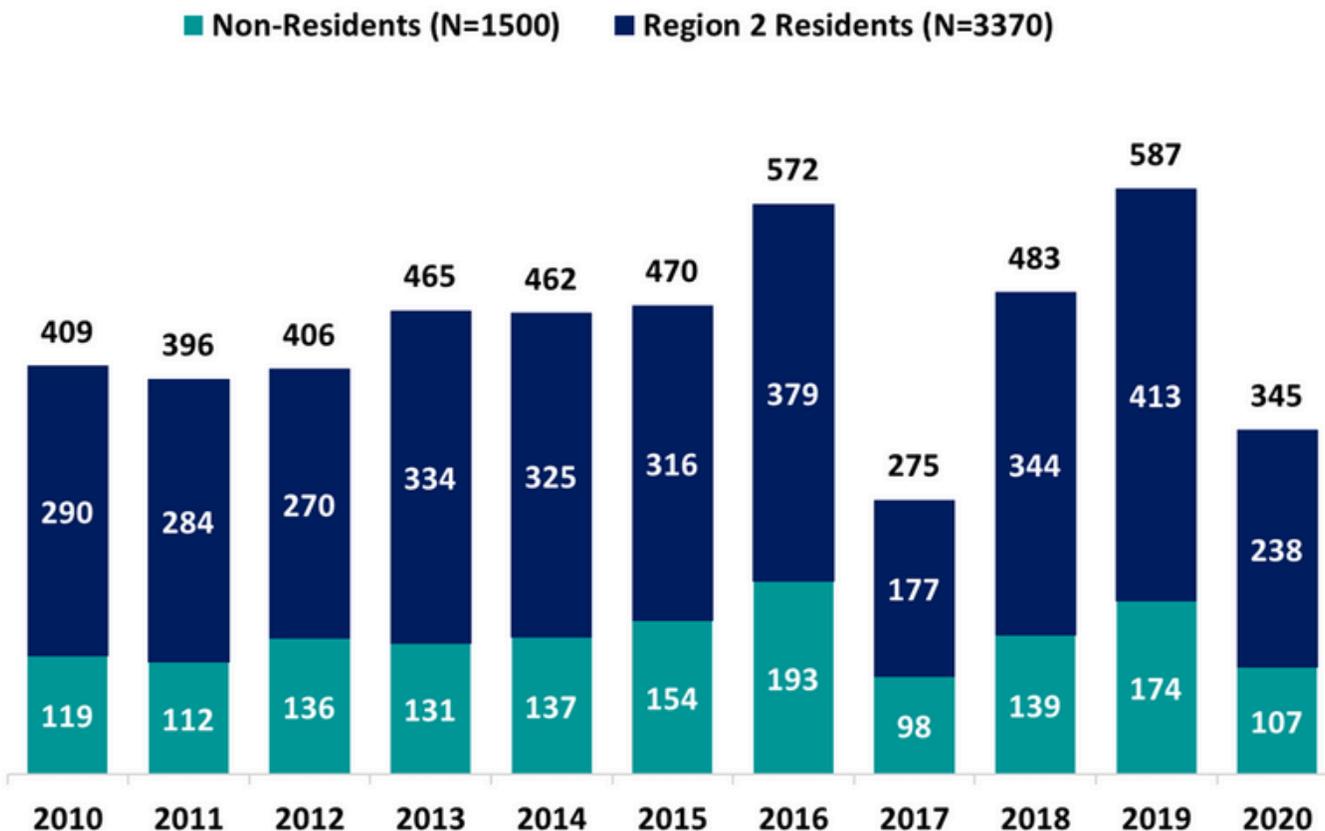
RESULTS

ANNUAL COUNTS & RATES: ALL CASES

From 2010 to 2020, there were 4,870 ED visits for heat-related illness in Region 2. There were 3,370 Region 2 residents who were treated in any ED, and 1,500 non-Region 2 residents who were treated in a Region 2 hospital.

On average, among Region 2 residents and non-residents treated in Region 2, there were 443 ED visits for heat-related illness every year. Most of these ED visits were for Region 2 residents (69%). There were approximately 136 ED visits every year for non-Region 2 residents (31%).

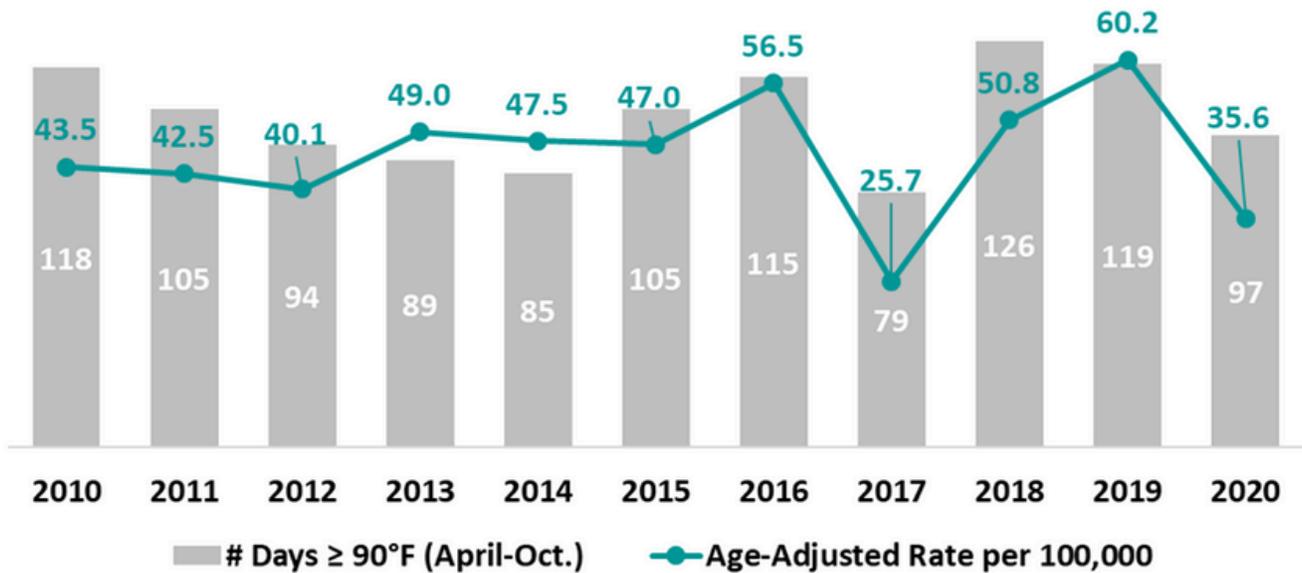
Heat-Related ED Visits by Year, 2010-2020



TEMPERATURE

Annual fluctuations in heat-related ED visits generally corresponded to variations in the numbers of hot days. The graph below shows the annual number of days greater than or equal to 90°F, from April through October, and the age-adjusted rate of heat-related ED visits for Region 2 residents. Temperature data comes from the National Weather Service station located at the Baton Rouge Metropolitan Airport in Baton Rouge.

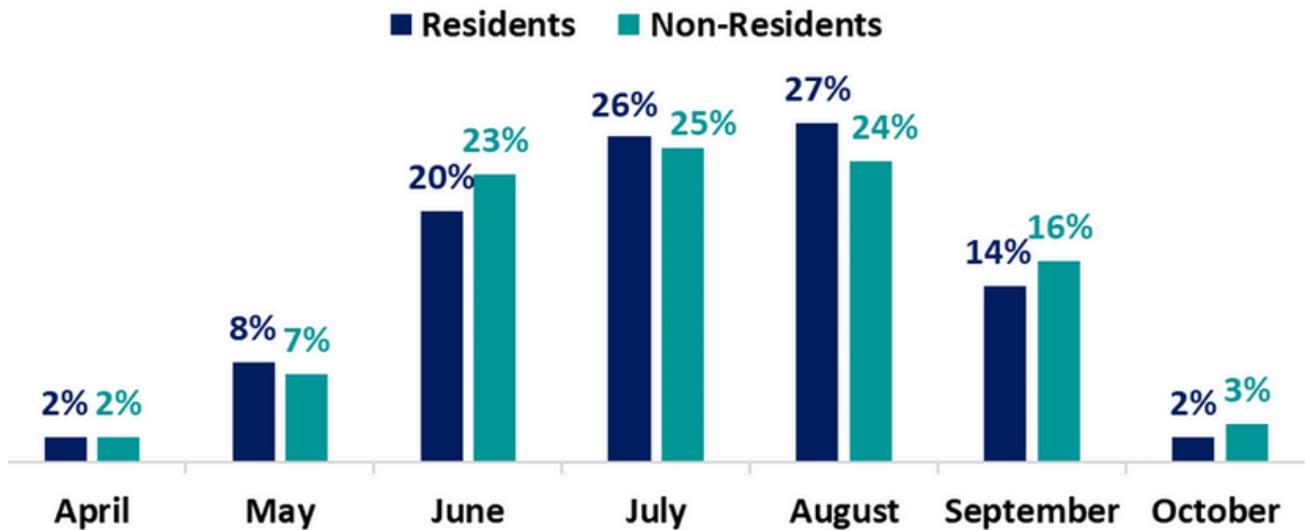
Region 2 Heat-Related ED Visits by Year and Days \geq 90°F, 2010-2020



MONTH

Although most cases occurred during the summer months, warm spring and fall temperatures contributed to more than one-fourth of all ED visits and hospitalizations. As the climate warms, more cases will occur in the fall and spring months.

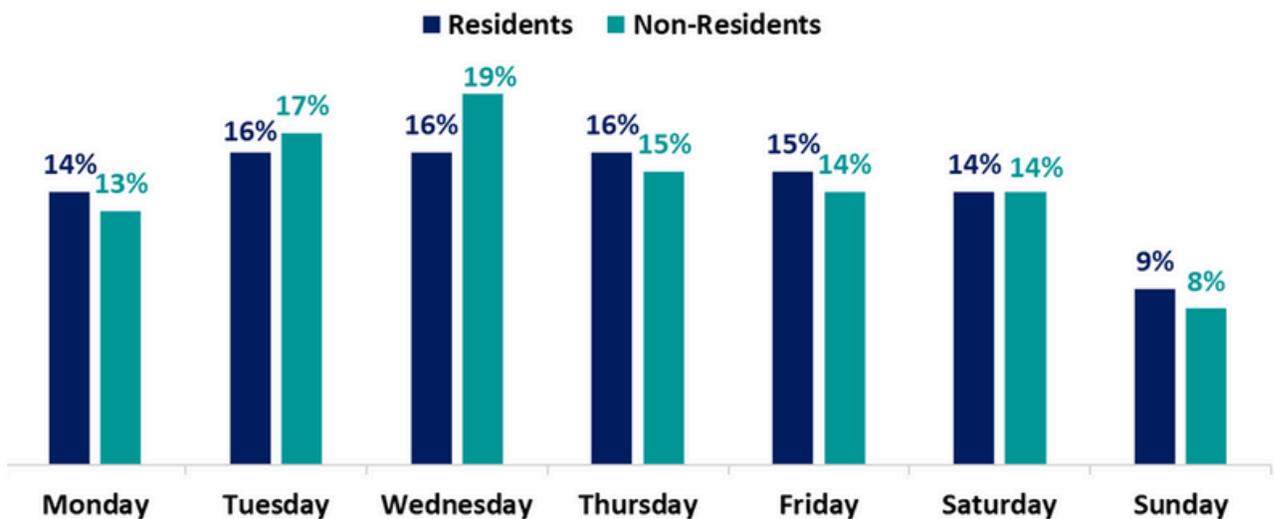
Region 2 Heat-Related ED Visits by Month, 2010-2020



DAY

Heat-related ED visits were summarized according to the day of the ED visit. **There was relatively even distribution by day of the week, with the exception of Sunday.**

Region 2 Heat-Related ED Visits by Day, 2010-2020

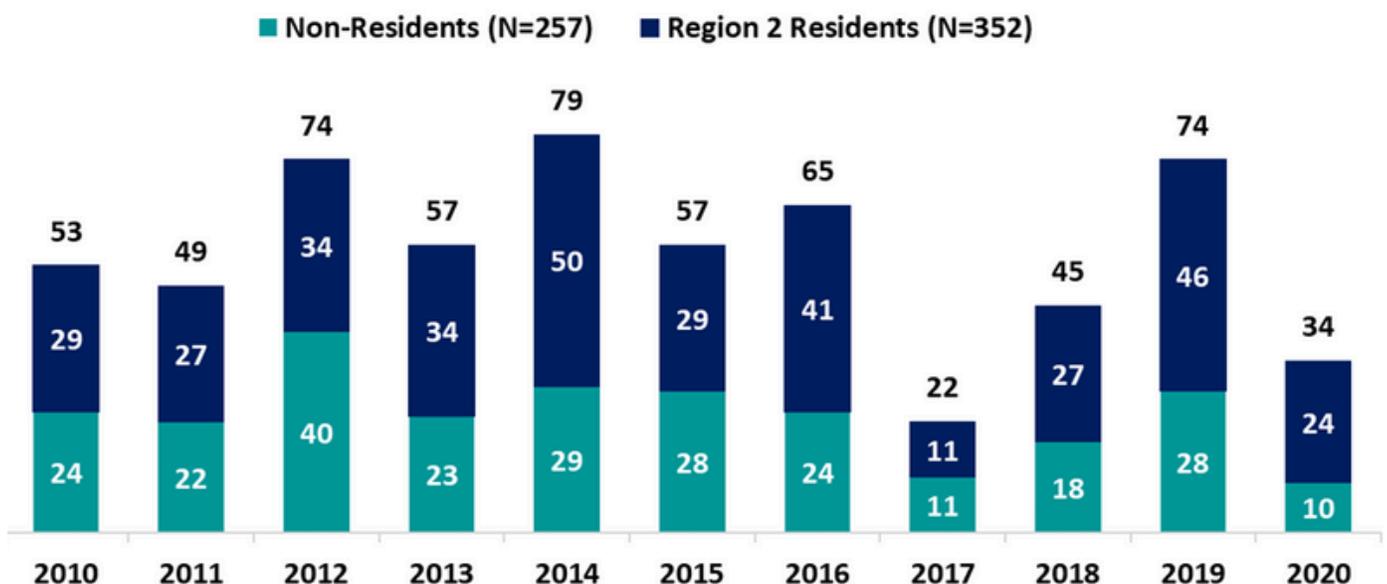


ANNUAL COUNTS AND RATES: WORKERS

Heat is a well-recognized occupational hazard and workers are one of the most at risk populations because their exposure and responses are largely controlled by their job requirements and employer. About one-quarter of Louisiana's workforce is at risk of heat exposure due to outdoor and physically demanding work in industries such as agriculture, construction, landscaping, transportation, utilities, and some manufacturing. Indoor workers who work in inadequately climatized settings are also at risk.

There was an annual average of 55 work-related ED visits for heat-related illness. Approximately 16% of these visits were for workers who were not Region 2 residents.

Work-Related ED Visits for Heat-Related Illness by Year, 2010-2020

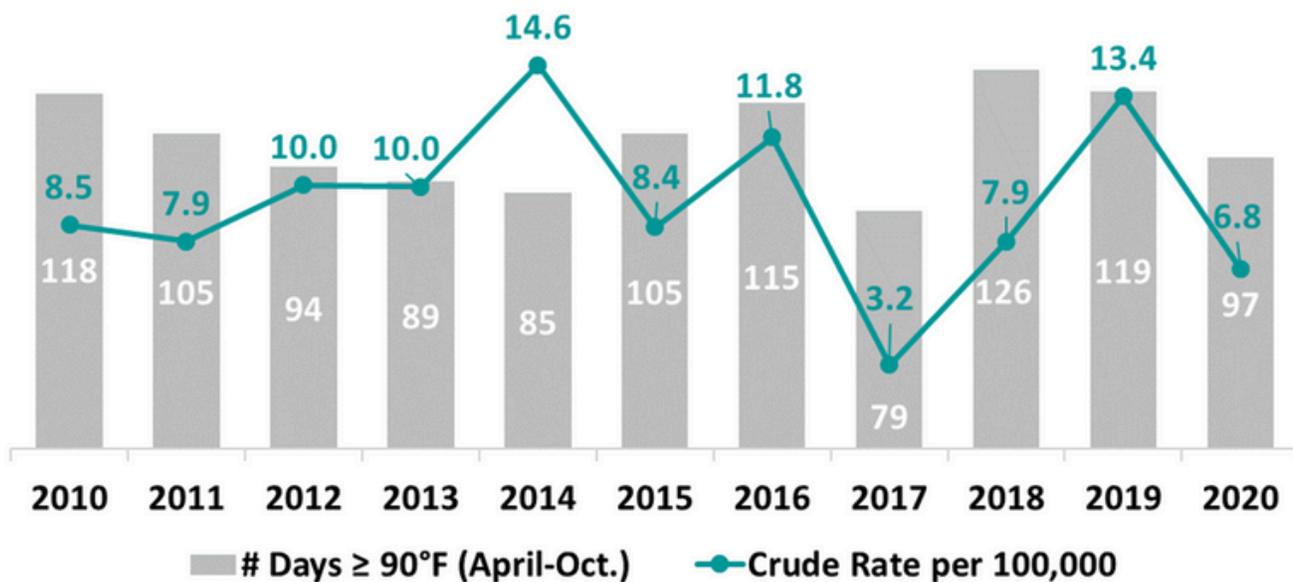




TEMPERATURE

Annual fluctuations in work-related ED visits for heat-related illness generally corresponded to variations in the numbers of hot days.

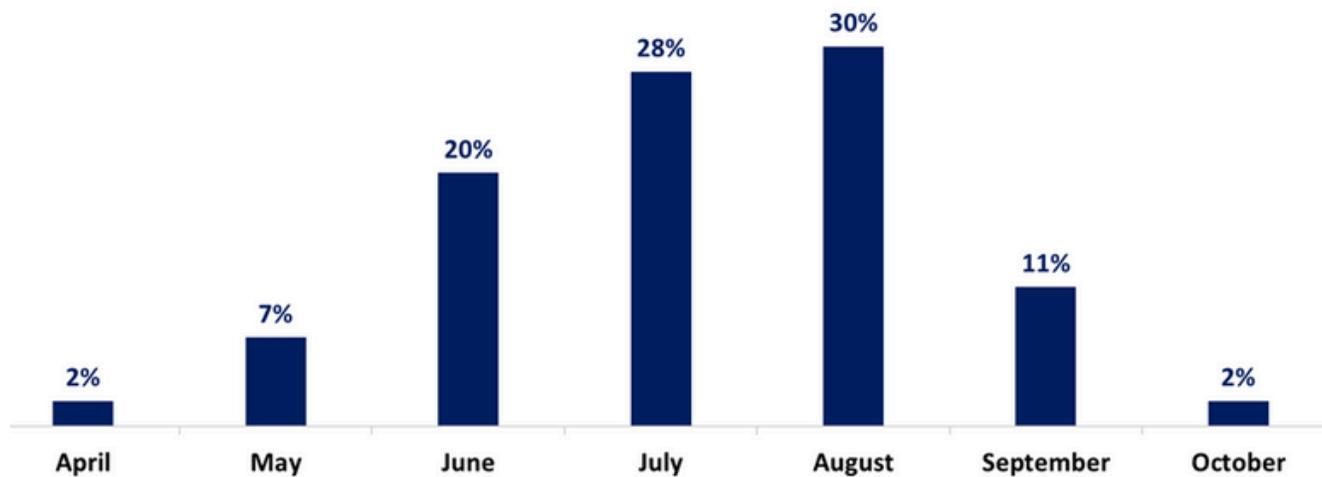
Region 2 Work-Related ED Visits for Heat-Related Illness by Year and Days $\geq 90^{\circ}\text{F}$, 2010-2020



MONTH

Most work-related ED visits for heat-related illness occurred during the summer months with a peak in August at 30%. Spring and fall accounted for 22% of ED visits.

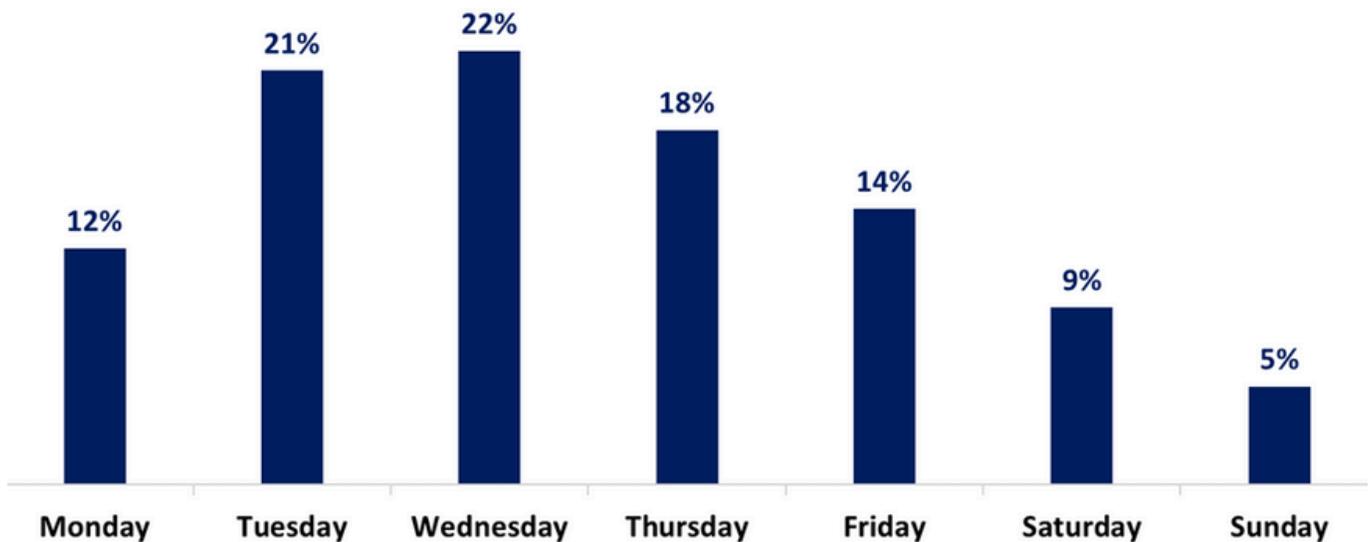
Region 2 Work-Related ED Visits for Heat Related Illness by Month, 2010-2020



DAY

Tuesday and Wednesday had the highest percentages of work-related ED visits for heat-related illness. Sunday had the fewest cases accounting for 5%.

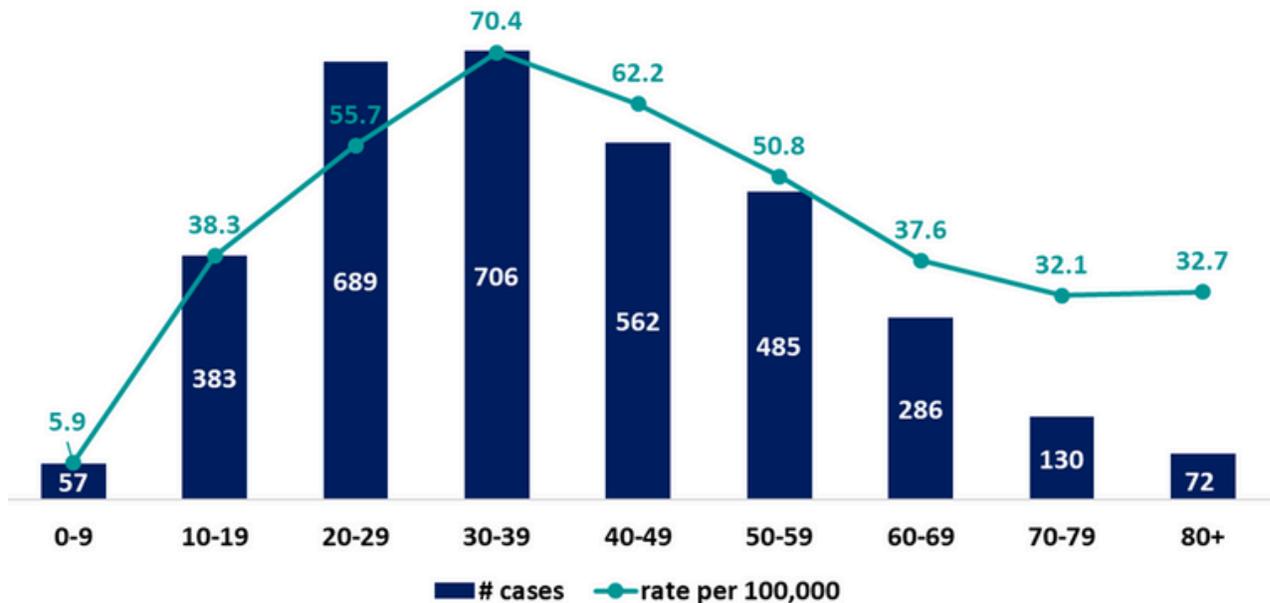
Region 2 Work-Related ED Visits for Heat Related Illness by Day, 2010-2020



AGE: ALL CASES

Individuals 30 to 39 years old had the highest age-adjusted rate, followed by the 40 to 49 age group. The smallest number and rate were for children under 10.

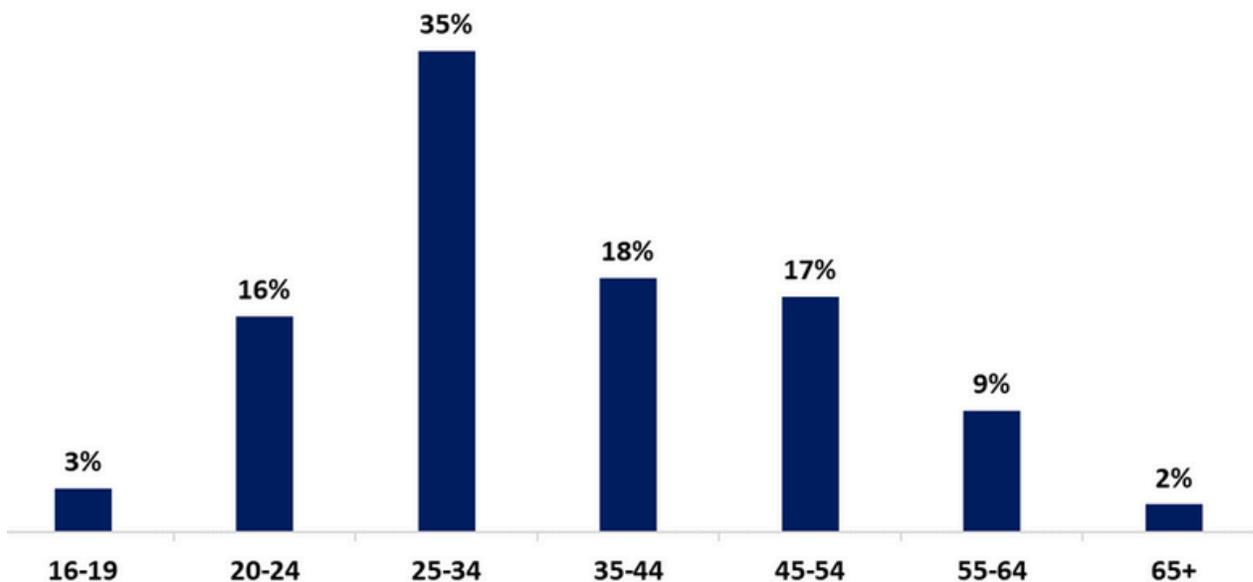
Region 2 Heat-Related ED Visits by Age, 2010-2020



AGE: WORKERS

Workers ages 25 to 34 had the most ED visits at 35%, followed by ages 35 to 44 at 18%.

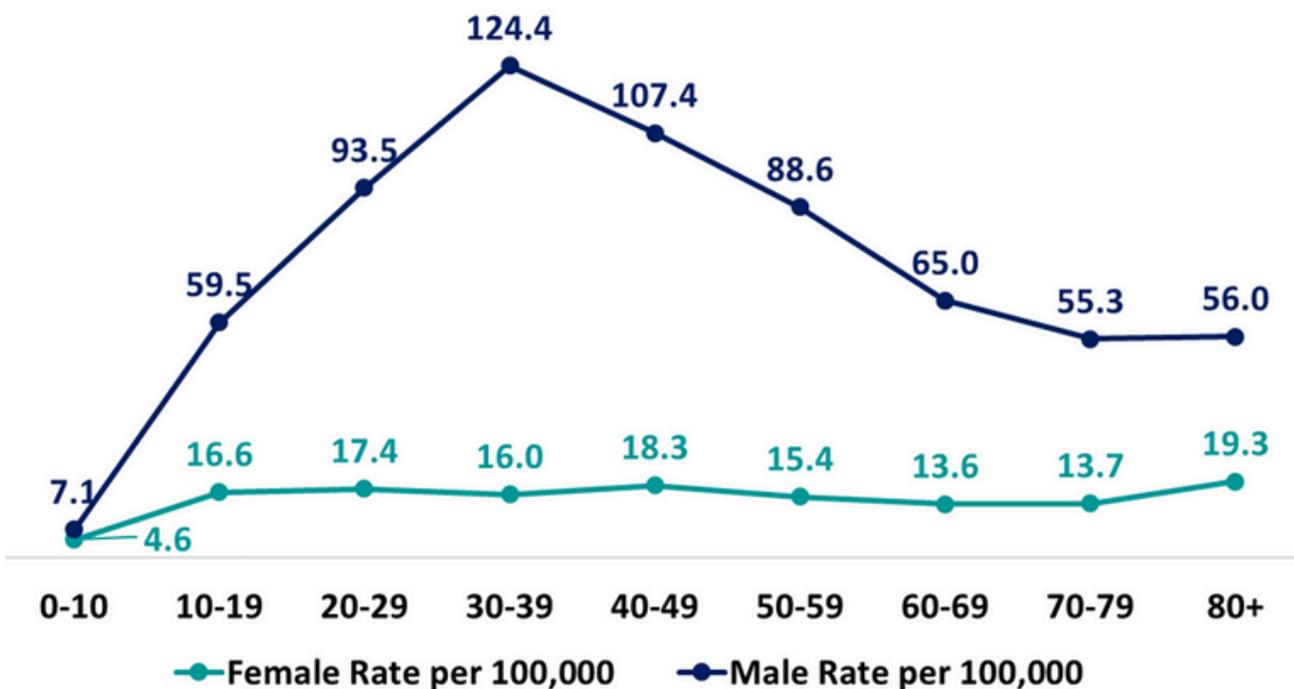
Region 2 Work-Related ED Visits for Heat-Related Illness by Age, 2010-2020



SEX: ALL CASES

Males made up 83% of all ED cases for heat-related illness and had a higher rate than females for every age group. The average annual rate for males was 5.2 times the female rate: 77.0 cases per 100,000 vs 14.8 cases per 100,000. Males have an increased risk of heat-related illness due to employment in outdoor occupations, activities such as yardwork and house repair including post-storm clean up, and sports such as football and golf. The difference in rates is less acute for the youngest age group.

Region 2 Heat-Related ED Visits by Sex and Age, 2010-2020



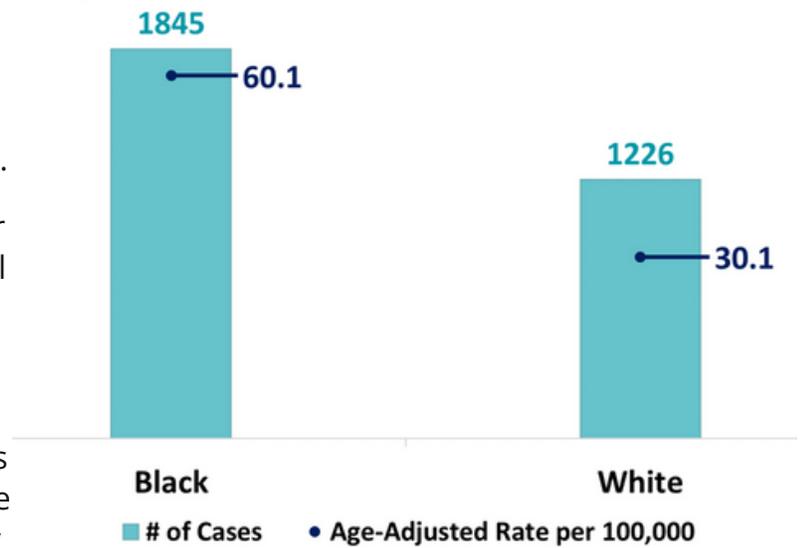
RACE: ALL CASES

Black residents had higher rates of ED visits for heat-related illness than white residents (60.1 vs 30.1). Other races are not shown due to low numbers.

Racial inequities in heat illness, and other health outcomes, are influenced by social determinants of health including income and housing.

Communities that experienced historical redlining experience hotter temperatures than neighboring areas due to factors like proximity to large roadways and industry and lack of tree cover. Neighborhoods with less trees have more sun exposure, resulting in hotter temperatures.

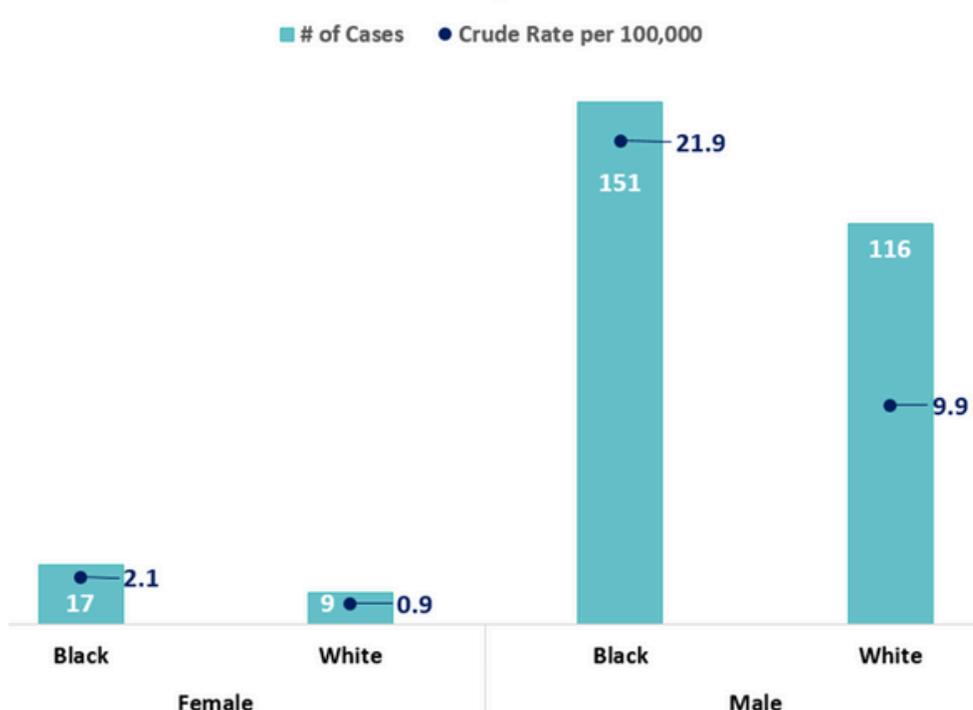
Region 2 Heat-Related ED Visits by Race, 2010-2020



RACE BY SEX: WORKERS

Workers were analyzed by sex and race to identify high risk subgroups. **Black male and Black female workers had higher rates than their white counterparts.**

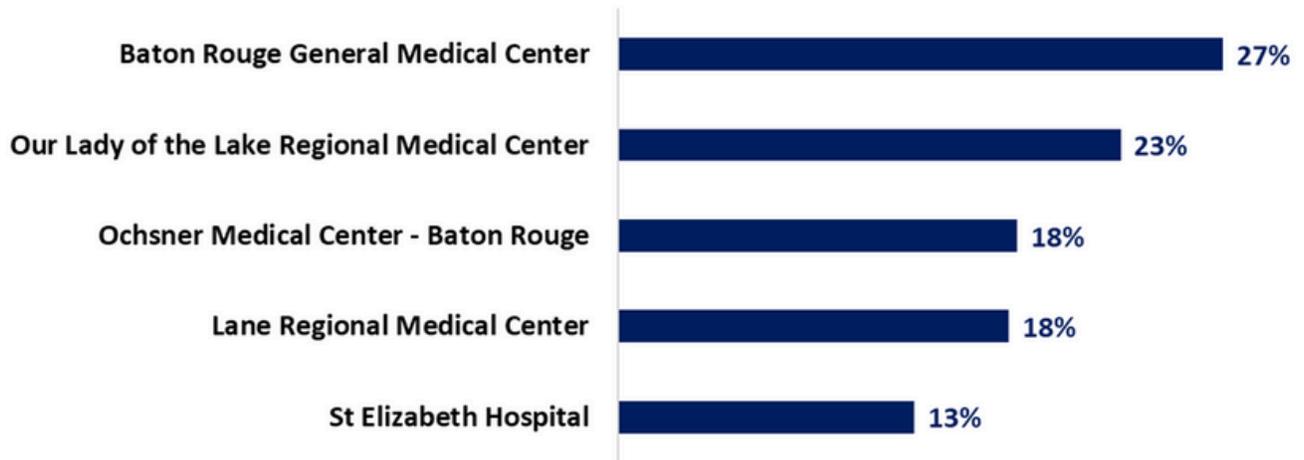
Region 2 Work-Related ED Visits for Heat-Related Illness by Race and Sex, 2010-2020



HOSPITAL: ALL CASES

The figure shows hospitals in Region 2 that had 5% or more ED visits for heat-related illness. **Baton Rouge General Medical Center had the greatest percent of ED visits at 27% followed by Our Lady of the Lake Regional Medical Center at 23%.**

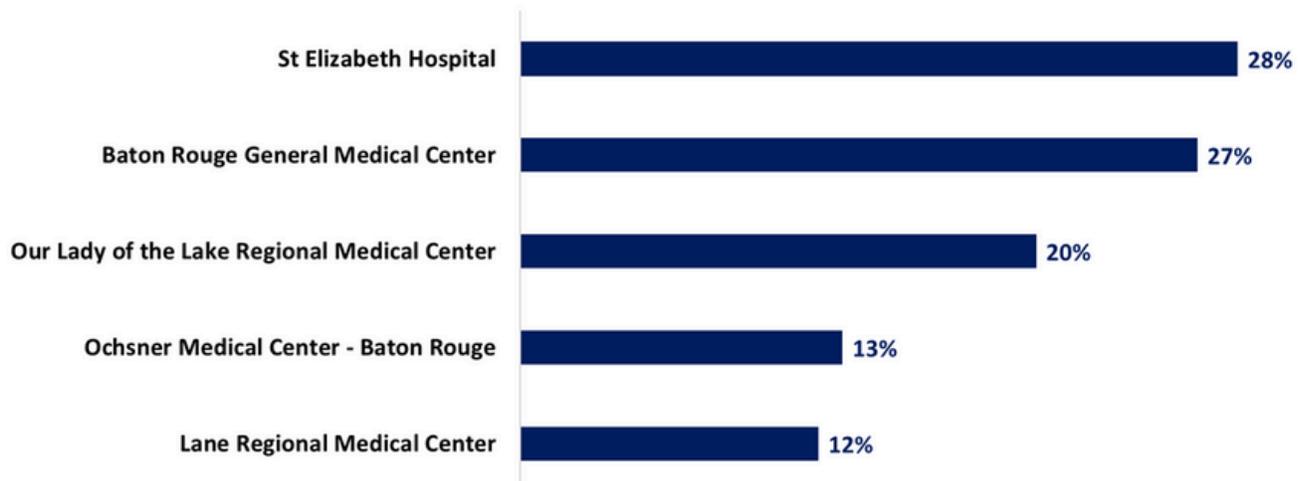
Region 2 Heat-Related ED Visits by Region 2 Hospital, 2010-2020



HOSPITAL: WORKERS

The figure shows hospitals in Region 2 that had 5% or more work-related HRI ED visits. **St Elizabeth Hospital had the most visits at 28%.**

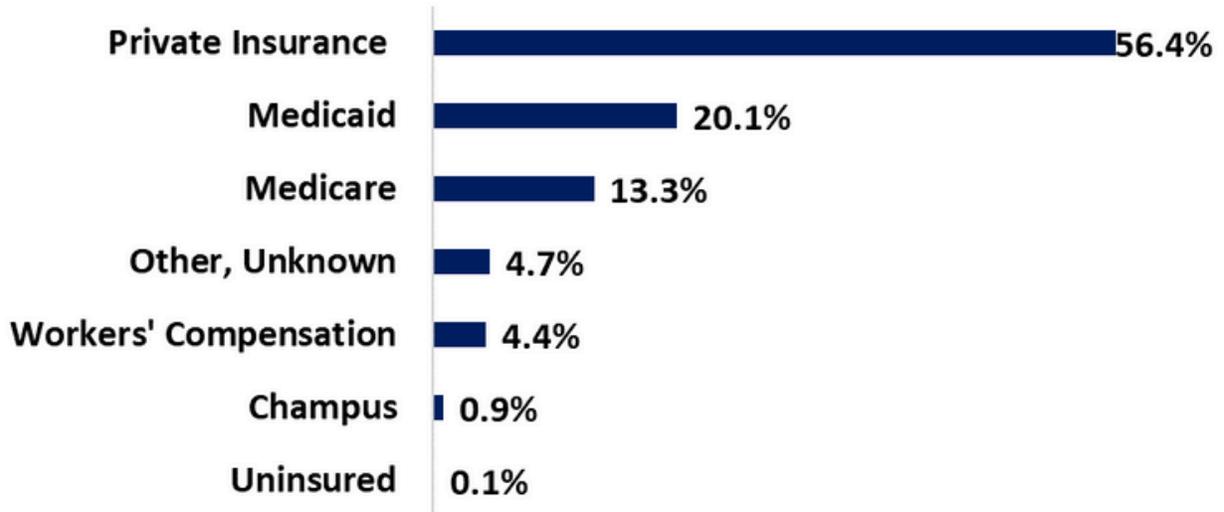
Region 2 Work-Related ED Visits for Heat-Related Illness by Region 2 Hospital, 2010-2020



PAYER: ALL CASES

Payer reflects the source of payment for the ED visit. **Private insurance was the most common payment source, followed by Medicaid and Medicare.**

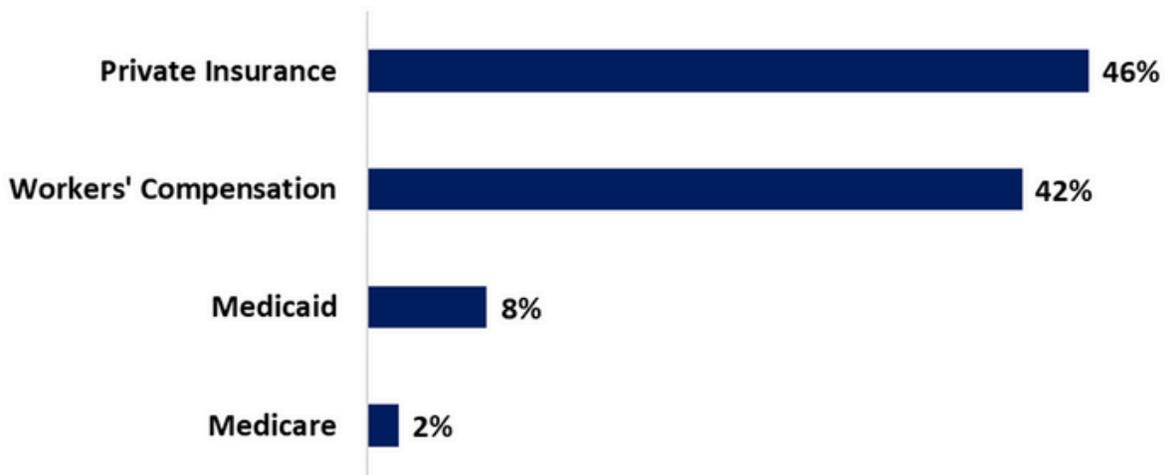
Region 2 Heat-Related ED Visits by Payer, 2010-2020



PAYER: WORKERS

Among workers, private insurance was the most common payment source accounting for 46%. Workers' compensation was the second most common at 42%.

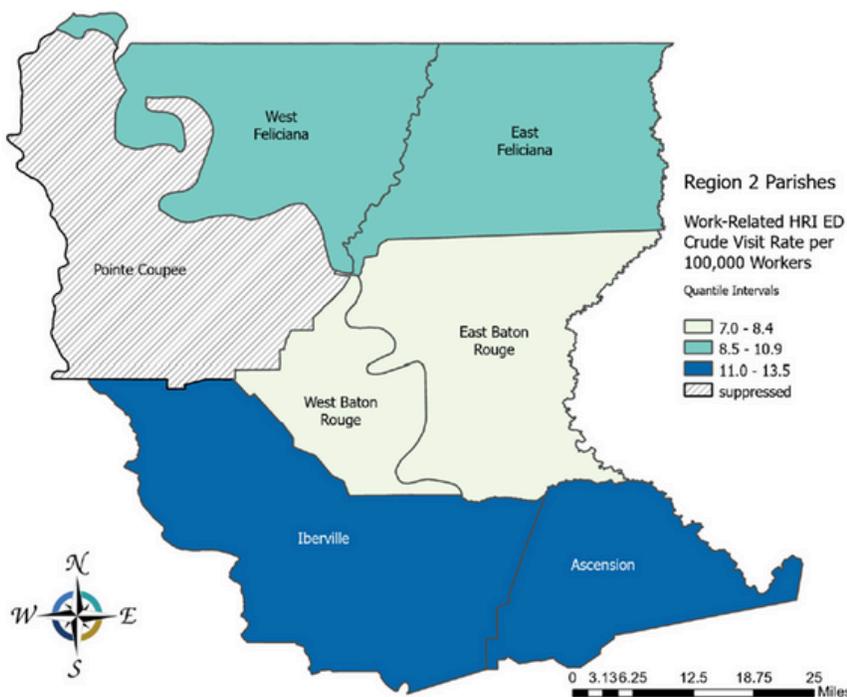
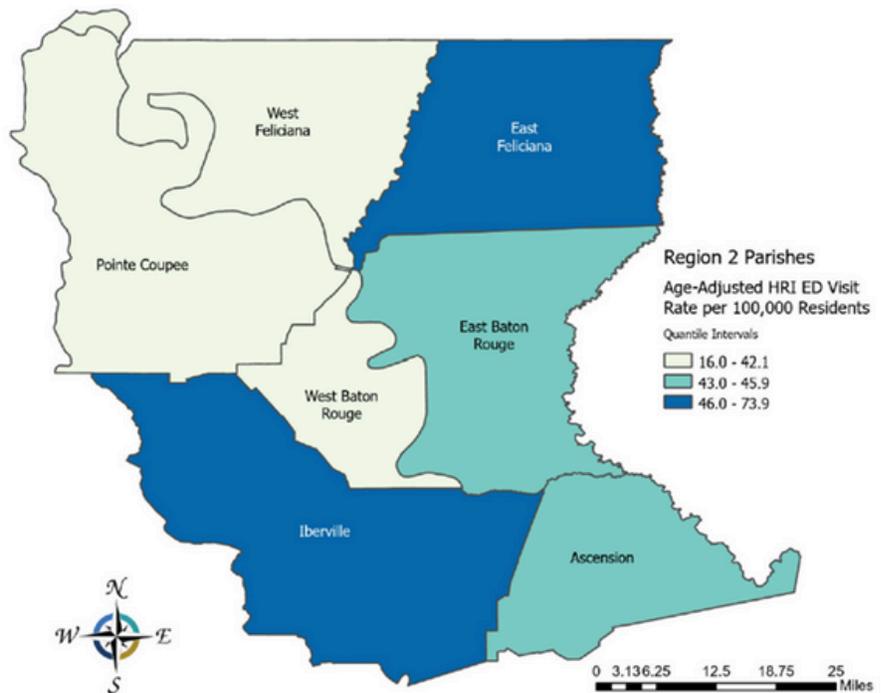
Region 2 Work-Related HRI ED Visits by Payer, 2010-2020



*The figure does not show all payment sources due to suppression.

LOCATION: ALL CASES

Rates of ED visits for heat-related illness were mapped based on the patient’s parish of residence. Rates are age-adjusted. East Feliciana and Iberville parishes had the highest rates.



LOCATION: WORKERS

Rates of work-related ED visits for heat-related illness were mapped based on the worker’s parish of residence. Iberville and Ascension parishes had the highest crude rates for heat-related illness.

APPENDICES

APPENDIX A: SUMMARY TABLE: REGION 2 RESIDENT HEAT-RELATED ILLNESS DATA, 2010-2020

Characteristic	Number	Percent
Overall	3,370	100.0%
Age		
0-9	57	1.7%
10-19	383	11.4%
20-29	689	20.4%
30-39	706	20.9%
40-49	562	16.7%
50-59	485	14.4%
60-69	286	8.5%
70-79	130	3.9%
80+	72	2.1%
Sex		
Female	564	16.7%
Male	2,806	83.3%
Race		
Black	1,845	54.7%
White	1,226	36.4%
Other	87	2.6%
Unknown	212	6.3%

Month		
Characteristic	Number	Percent
April	77	2.3%
May	277	8.2%
June	671	19.9%
July	889	26.4%
August	905	26.9%
September	472	14.0%
October	79	2.3%
Day		
Monday	458	13.6%
Tuesday	535	15.9%
Wednesday	548	16.3%
Thursday	555	16.5%
Friday	491	14.6%
Saturday	483	14.3%
Sunday	300	8.9%
Region 2 Hospitals (N=3,124)		
Baton Rouge General Medical Center	857	27.4%
Earl K Long Medical Center	5	0.2%
Lane Regional Medical Center	553	17.7%
Ochsner Medical Center - Baton Rouge	565	18.1%
Our Lady of the Lake Regional Medical Center	712	22.8%

Characteristic	Number	Percent
St. Elizabeth Hospital	420	13.4%
Woman's Hospital	12	0.4%
Payer		
Champus	30	0.9%
Medicaid	679	20.1%
Medicare	449	13.3%
Other/Unknown	160	4.7%
Private	1,899	56.4%
Uninsured	5	0.1%
Workers' Compensation	148	4.4%
Parish		
Ascension	566	16.8%
East Baton Rouge	2,205	65.4%
Iberville	247	7.3%
East Feliciana	155	4.6%
Pointe Coupee	52	1.5%
West Baton Rouge	117	3.5%
West Feliciana	28	0.8%

APPENDIX B: SUMMARY TABLE: NON-REGION 2 RESIDENT HEAT-RELATED ILLNESS DATA, 2010-2020

Characteristic	Number	Percent
Overall	1,500	100.0%
Age		
0-9	24	1.6%
10-19	162	10.8%
20-29	376	25.1%
30-39	371	24.7%
40-49	245	16.3%
50-59	185	12.3%
60-69	82	5.5%
70-79	36	2.4%
80+	19	1.3%
Sex		
Female	244	16.3%
Male	1,256	83.7%
Race		
Black	274	18.3%
White	1,131	75.4%
Other	45	3.0%
Unknown	50	3.3%

Month		
Characteristic	Number	Percent
April	33	2.2%
May	109	7.3%
June	348	23.2%
July	380	25.3%
August	355	23.7%
September	235	15.7%
October	40	2.7%
Day		
Monday	201	13.4%
Tuesday	251	16.7%
Wednesday	284	18.9%
Thursday	223	14.9%
Friday	206	13.7%
Saturday	210	14.0%
Sunday	125	8.3%
Region 2 Hospital		
Baton Rouge General Medical Center	225	15.0%
Lane Regional Medical Center	*	*
Ochsner Medical Center -Baton Rouge	487	32.5%
Our Lady of the Lake Regional Medical Center	525	35.0%
St. Elizabeth Hospital	183	12.2%

Characteristic	Number	Percent
Woman's Hospital	*	*
Payer		
Champus	13	0.9%
Medicaid	242	16.1%
Medicare	135	9.0%
Other/Unknown	27	1.8%
Private	968	64.5%
Uninsured	115	7.7%
Workers' Compensation	0	0%
State of Residence		
Alabama	18	1.2%
Arkansas	10	0.7%
Florida	12	0.8%
Georgia	23	1.5%
Illinois	5	0.3%
Kentucky	5	0.3%
Louisiana (excluding Region 2)	1,205	80.3%
Michigan	6	0.4%
Mississippi	79	5.3%
North Carolina	12	0.8%
Tennessee	14	0.9%
Mississippi	79	5.3%
North Carolina	12	0.8%

APPENDIX C: SUMMARY TABLE: WORKERS REGION 2 RESIDENT HEAT-RELATED ILLNESS DATA, 2010-2020

Characteristic	Number	Percent
Overall	352	100.0%
Age		
16-19	11	3.1%
20-24	55	15.6%
25-34	123	34.9%
35-44	65	18.5%
45-54	60	17.0%
55-64	31	8.8%
65+	7	2.0%
Sex		
Female	30	8.5%
Male	322	91.5%
Race		
Black	168	47.7%
White	125	35.5%
Other	18	5.1%
Unknown	41	11.6%
Month		
April	8	2.3%
May	23	6.5%

Characteristic	Number	Percent
June	72	20.5%
July	98	27.8%
August	107	30.4%
September	38	10.8%
October	6	1.7%
Day		
Monday	43	12.2%
Tuesday	73	20.7%
Wednesday	78	22.2%
Thursday	62	17.6%
Friday	49	13.9%
Saturday	31	8.8%
Sunday	16	4.5%
Region 2 Hospitals (N=314)		
Baton Rouge General Medical Center	84	26.8%
Lane Regional Medical Center	37	11.8%
Ochsner Medical Center - Baton Rouge	40	12.7%
Our Lady of the Lake Regional Medical Center	64	20.4%
St. Elizabeth Hospital	89	28.3%

Payer		
Champus	*	*
Medicaid	27	7.7%
Medicare	7	2.0%
Other/Unknown	*	*
Private	163	46.3%
Uninsured	0	0%
Workers' Compensation	148	42.0%

***Counts less than 5 are suppressed to protect patient confidentiality.**