

Racial Differences in Health Outcomes

Linn County, Iowa

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Linn County, Iowa

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Racial Differences in Health Outcomes

An integral component in improving the health of our overall population is examining and understanding the differences that occur between different populations in a community. These differences are known as health disparities or the greater or lesser occurrence of health outcomes between populations (National Academies of Science, Engineering, and Medicine; 2017). Health disparities adversely affect groups of people who continually experience greater obstacles to achieving good health based on an individual's race, ethnicity; religion, socioeconomic status, sex, age, sexual orientation, mental health status, disability, or geographic residence. While many populations may experience health disparities, for the purpose of this report an emphasis will be placed on health disparities related to race and ethnicity in Linn County, Iowa.

Race and ethnicity tend to account for a large proportion of disparities related to public health issues. Nationwide, minority populations have higher rates of chronic disease, mortality, and poorer health outcomes compared to their white counterparts (National Academies of Science, Engineering, and Medicine; 2017). Linn County is no different. Despite having a predominantly white (88.8%) population, some racial and ethnic minorities experience a greater burden for disease and injury in Linn County. In this report, differences in disease, socioeconomic factors, health status, and injury burden will be investigated by race. With increased understanding of the health inequities by race, this will enable community action to be taken to address these inequities in Linn County.

Methods

A variety of indicators are examined throughout this report. The key indicators were selected based on relevance to health and health disparities as well as the availability of data. Data are presented by race/ethnicity to describe gaps in health status; however, it is important to note that race/ethnicity alone is not a cause of any health condition or status. Data may be presented as percentages, rate per a specific portion of population (ex: per 10,000, 100,000), or ratios. Ratios in this report reflect disparity between populations. Disparity ratios are calculated by dividing the rate for a population (Rate A) by the best rate (Rate B) for a selected health indicator. This defines how much more likely a particular event is expected to occur in one population compared to another. Each indicator may have a different reference group, or population to which another group is compared; these groups do not have an associated disparity ratio listed. Please see Table 1 for an interpretation of the disparity levels associated with the disparity ratios presented throughout this report.

Table 1. Understanding the Report - Legend

Disparity Level	Symbol	Disparity Ratio	Meaning Interpretation
Low/No		1.0 – 1.4	Little or no disparity exists. However, continued monitoring should occur.
Moderate		1.5 – 2.4	A moderate disparity exists, requiring intervention.
Significant		≥ 2.5	A significant disparity exists, requiring an immediate intervention.
Reference Group	✓		The group with the best rate, and meets suppression rules (20 or more cases). Group to which all other groups are compared.
Not Available or Not Applicable	N/A		Data for the specific population could not be obtained or had “0” cases.
Suppressed	^		Age-adjusted rates and disparity ratios cannot be calculated when number of cases are less than 20 during the comparison period. Percentages with cases less than 6 cannot be calculated due to confidentiality requirements.

Demographic Characteristics

Overtime, the demographic characteristics of Linn County have shifted to become slightly more diverse. Between the 2000 and 2010 census, minority populations in Linn County grew at a faster rate compared to their white counterparts. While still small compared to the entire population, a small increase has a large impact on percent change in a population. The smallest minority population, Native Hawaiian/Pacific Islanders, experienced an increase of 89 people from 2000 to 2010, resulting in a 97.8% increase in population (Table 1). The largest minority population, Black/African American or African American, experienced an increase of 3,427 people or 69.7% during this period.

Table 2. Population by Race and Ethnicity for Linn County, 2000 and 2010

	2000		2010		Change, 2000 to 2010	
	#	%	#	%	#	%
Total population	191,701	100.0	211,226	100.0	19,525	10.2
Race						
One Race	188,942	98.6	206,293	97.7	17,351	9.2
White	179,999	93.9	191,884	90.8	11,885	6.6
Black/African American	4,919	2.6	8,346	4.0	3,427	69.7
American Indian/Alaskan Native	418	0.2	565	0.3	147	35.2
Asian	2,634	1.4	3,806	1.8	1,172	44.5
Native Hawaiian/Pacific Islander	91	0.1	180	0.1	89	97.8
Other race	881	0.5	1,512	0.7	631	71.6
Two or more races	2,759	1.4	4,933	2.3	2,174	78.8
Ethnicity						
Hispanic or Latino	2,722	1.4	5,534	2.6	2,812	103.3
Not Hispanic or Latino	188,979	98.6	205,692	97.4	16,713	8.8

Source: U.S. Census Bureau, 2000, 2010

Table 3. Population Estimates, Linn County – 2017

	Total		White		Black/African American		Asian		Two or More		Other		Hispanic/Latino	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Total	220,008	100.0	195,466	88.8	10,863	4.9	4,991	2.3	6,138	2.8	2,550	1.0	6,790	3.1
Sex														
Male	108,534	49.3	95,972	49.1	5,831	53.7	2,439	48.9	2,905	47.3	1,387	54.4	3,485	51.3
Female	111,474	50.7	99,494	50.9	5,032	46.3	2,552	51.1	3,233	53.7	1,163	45.6	3,305	48.7
Age Group														
0-17	52,151	23.7	42,876	21.9	3,804	35.0	1,225	24.5	3,638	59.3	608	23.8	2,647	39.0
18-24	20,932	9.5	17,494	8.9	1,365	12.6	534	10.7	986	16.1	553	21.7	1,027	15.1
25-34	29,868	13.6	25,703	13.1	1,968	18.1	1,197	24.0	537	8.7	463	18.2	1,019	15.0
35-44	57,866	12.7	24,676	12.6	1,615	14.9	866	17.4	456	7.4	385	15.1	880	13.0
45-54	59,235	13.3	27,290	14.0	955	8.8	504	10.1	274	4.5	212	8.3	592	8.7
55-64	27,374	12.4	26,119	13.4	665	6.1	240	4.8	152	2.5	198	7.8	417	6.1
65+	32,450	14.7	31,308	16.0	491	4.5	425	8.5	95	1.5	131	5.1	208	3.1

Source: American Community Survey 5-yr Estimates, 2013-2017



In 2017, Linn County’s population was an estimated 220,008 (Table 2), an increase of 8,782 people from the 2010 census. The majority of the population are white, with 195,466 people (88.8% of all Linn County residents). Black/African American residents account for the largest minority group, constituting 4.9% of the population, followed by Hispanic/Latino at 3.1%. It is interesting to note, that the largest concentration of residents identified as two or more races is in the 0-17 age category accounting for 59.3% of residents identified as two or more race.

Social and Economic Characteristics

Many factors may contribute to or limit an individual's ability to achieve an optimal level of health. As is the case in many other cities, counties, and states across the United States, some communities in Linn County lack the social, economic, and environmental resources necessary to attain good health. One such measure of this

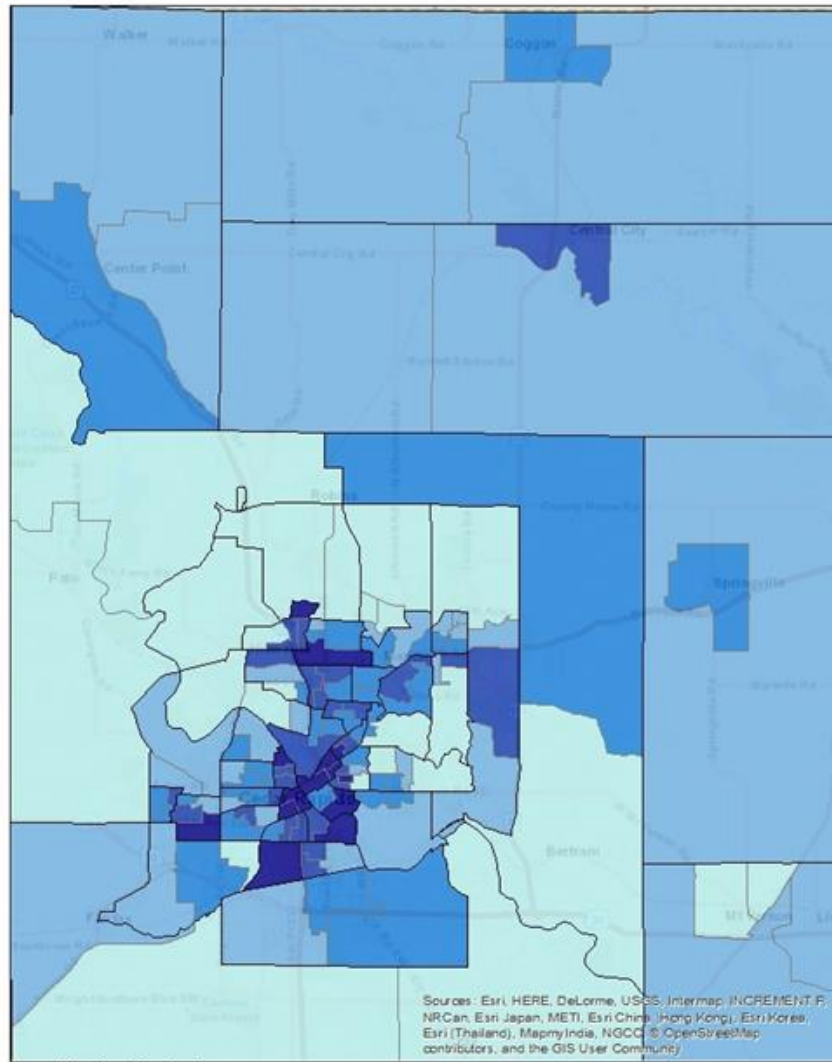


disparity is the Area Deprivation Index (ADI) that reflects populations at a higher risk for poor health outcomes such as cardiovascular disease, cancer, increased hospitalizations, and high mortality rates (Broad Street, 2018). These indicators include 17 measures from the American Community Survey of education, income, poverty, employment, and housing

stock.

The index is a national ranking that ranges from zero to 100, with a higher ranking reflecting greater deprivation for a specific area. In Figure 1, the ranking is applied at the census block level, with the darkest blue illustrating the greatest areas of deprivation in Linn County. Overall, approximately 9,500 residents in Linn County live in the most deprived areas. Of these individuals, 2,314 are Black/African American, non-Hispanic, which accounts for approximately 21.3% of Black/African American, non-Hispanic residents in Linn County (Broad Street, 2018).

Figure 1. Area Deprivation Index by Block Group, 2016 - Linn County, IA



Area Deprivation Index
 0 - 32 33 - 49 50 - 62 63 - 78 79 - 100

4.3% of Linn County Overall
2.7% of **White, Non-Hispanic** Residents
21.3% of **Black, Non-Hispanic** Residents
 live in the most deprived areas

Indicators of Deprivation

Area Deprivation Index	92
Employed person 16+ in white collar occupations (%)	63.6
Families below poverty level (%)	6.1
High School Graduation Obtained Ages 25 Years and Older (%)	94.6
Households with more than 1 person per room (%)	1.2
Households without a motor vehicle (%)	5.4
Households without a telephone (%)	2.9
Households without complete plumbing (%)	0.3
Income disparity (log score)	2.1
Less than high school education (%)	1.6
Median family income (\$)	79,689
Median gross rent (\$)	709
Median home value (%)	148,600
Median monthly home cost (\$)	1,035
Owner-occupied housing units (%)	73.5
Percent of population below 150% of poverty threshold (%)	17.2
Single parent households with children under 18 years (%)	19.8
Unemployment Ages 16 Years and Older (%)	4.2

Source: Broad Street, 2018; University of Wisconsin School of Medicine and Public Health, 2018

Table 4. Social and Economic Well-being by Race, Linn County

Category	Sub-Category	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino	
		Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio
Education	High School Drop-out Rate, 2018	2.4%	1.7%	1.5	6.6%	6.0	1.1%	✓	3.2%	2.9	4.5%	4.1
	High School Graduation Rates, 2018	89.0%	90.4%	✓	79.7%	1.1	^	^	85.4%	1.1	83.5%	1.1
	Bachelor's Degree or Higher (25 yr+)	32.3%	32.5%	1.9	15.4%	4.1	62.7%	✓	26.5%	2.4	22.9%	2.7
Employment	Unemployed	3.8%	3.4%	✓	10.8%	3.2	5.3%	1.6	6.3%	1.9	4.2%	1.2
Income	Median Household Income	\$62,702	\$63,942	1.3	\$30,478	2.8	\$84,439	✓	\$55,119	1.5	\$52,151	1.6
Poverty	All Ages	9.5%	8.0%	1.5	30.5%	5.5	5.5%	✓	22.7%	4.1	15.8%	2.9
	Children<18 years	11.4%	8.6%	9.0	32.8%	34.2	0.96%	✓	24.1%	25.1	16.9%	17.6
	Elderly 65+ years	5.6%	5.4%	✓	8.4%	1.6	0.0%	N/A	0.0%	N/A	10.6%	2.0
Housing	Living in home they own	74.2%	77.4%	✓	26.2%	3.0	52.7%	1.5	47.2%	1.6	62.6%	1.2
Disability	Percent with a disability	10.0%	10.3%	2.6	8.6%	2.2	4.0%	✓	7.3%	1.8	6.3%	1.6
Disparity Ratio Ranges												
✓ Reference Group		● Low/No (1.0-1.4)			● Moderate (1.5 – 2.4)			● Significant (2.5 and higher)				

Source: Iowa Department of Education, 2017-2018, American Community Survey, 2013-2017

N/A = Not Available or Not Applicable ^ Values Suppressed

Education

In 2018, Linn County had an overall graduation rate of 89%, with white students slightly more likely to graduate than their other racial counterparts. Across the different racial groups, Black/African American students had the lowest graduation rate with 79.7% of Black/African American students graduating from high school. Likewise, Black/African American students were 6 times more likely to drop out of high school than Asian and nearly 4 times more likely than white students. This highlights a significant disparity for Black/African American students in Linn County. Following graduation from high school, approximately 32% of adults 25 years of age or older in Linn County obtain a bachelor's degree or higher. The rate is nearly double for Asian residents in Linn County with 62.7% of this population having attained at least a bachelor's degree. Black/African American residents are 4.1 times less likely to attain a Bachelor's degree or higher compared to Asian residents and 2.1 times less likely less likely compared to their white residents. Similarly, Hispanic/Latino residents and residents of "Two or More" races fair worse than their Asian and White counterparts.

Employment

According to the 2013-2017 American Community Survey, 3.8% of Linn County residents 16 years of age and older are unemployed. This is slightly less than that of the state of Iowa (4.1%). While the overall unemployment rate continues to decrease in Linn County, specific populations experience higher unemployment rates than others. In 2017, 3.4% of white residents were unemployed compared to 10.8% of Black/African American, 6.3% of "Two or More" race, 5.3% of Asian, and 4.2% of Hispanic residents.

Income

Asian residents have the highest median income compared to residents of other races, at \$84,439. In comparison, the median income of Black/African American residents is nearly 3 times lower than that of Asian households and 2 times lower than white households. This disparity continues to present when examining the poverty rate across the different race/ethnicity groups. As may be expected, Asian residents experience the lowest poverty rate in Linn County with 5.5% of all age categories and 0.96% of children under the age of 18 at or below poverty compared to an overall rate in the county of 9.5% and 11.4%, respectively. Compared to Asian residents, the poverty rate among Black/African American residents is 5.5 times higher. This disparity remains true when comparing across all race categories. However, residents identified as "Two or More" races also experience high rates of poverty. While a direct correlation cannot be ascertained, disparity for Black/African American households may be attributed to lower level of educational attainment and an increased unemployment rate.

Disability

Approximately 1 in 10 of Linn County residents has a disability. Disabilities are most prevalent among white residents (10.3%), followed closely by Black/African American (8.6%), "Other" race (8.4%), and "Two or More" races. Least likely to have disabilities are Asian residents.

Access to Health Care

Table 5. Access to Health by Race, Linn County

Indicator	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino	
	Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio
Percent of population uninsured, 2016-2018*	4.4%	3.8%	1.6	8.6%	3.6	2.4%	✓	10.2%	4.3	18.8%	7.8
Percent of adults who could not see a doctor in the past 12 months due to cost, 2016-2018*	8.3%	7.3%	✓	21.3%	2.9	N/A	N/A	16.9%	2.3	20.7%	2.8
Disparity Ratio Ranges											
✓ Reference Group	● Low/No (1.0 – 1.4)	● Moderate (1.5 – 2.4)		● Significant (2.5 and higher)							

* American Community Survey – 5yr estimates, 2013-2017 ** Behavioral Risk Factor Surveillance System N/A = Not Available



With the passing of the Affordable Care Act (ACA), millions of people across the United States have gained access to health insurance. Between 2013 and 2017, the percent of Linn County residents who did not have health insurance decreased by nearly 50% from 8% to 4.4%, respectively. However, some populations still experience barriers to accessing health insurance. Comparatively, the percent of Hispanic/Latino residents (18.8%) who are uninsured is nearly 8 times that of Asian residents (2.4%). Furthermore, residents identified as “Two or More” races (10.2%) and Black/African American residents experience an uninsured rate 4.3 and 3.6 times that of Asian residents, respectively.

Additionally, despite a higher percentage of residents covered by health insurance, some do not have income sufficient enough to cover the cost of care when needed. Between 2016 and 2018, an estimated 8% of adults in Linn County could not seek care due to cost. This burden is nearly three times higher among Black/African American and Hispanic residents and 2.3 times higher among residents identified as “Two or More” races when compared to white residents.

Maternal and Child Health

Table 6. Maternal and Child Health by Race, Linn County

Indicator	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino	
	Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio
Infant Death Rate per 1,000 live births*	5.2	6.1	✓	24.0	3.9	^	^	^	^	^	^
Teen Birth Rate per 1,000 females 15-19 years (2017)**	13.9	10.8	✓	51.3	4.8	^	^	^	^	18.9	1.8
Late or No Prenatal Care***	17.9%	14.3%	1.9	39.8%	5.4	7.4%	✓	17.9%	2.4	24.8%	3.4
Maternal tobacco use during pregnancy***	12%	12.5%	1.2	10.1%	✓	-	-	19.7%	2.0	11.6%	1.1
Disparity Ratio Ranges											
✓ Reference Group	● Low/No (1.0-1.4)		● Moderate (1.5 – 2.4)		● Significant (2.5 and higher)						

*CDC WONDER natality and mortality database, 2015-2017 ** CDC WONDER natality and mortality database, 2017; *American Community Survey – 5yr estimates, 2013-2017* *** CDC WONDER natality and mortality database, 2016-2018 ^Values suppressed N/A = Not Available or Not Applicable

Assurance of the health and well-being of mothers, infants, and children is an important public health priority, as their well-being impacts that of future generations (Office of Disease Prevention and Health Promotion, 2014). A variety of social and environmental determinants may influence the level of well-being and health a person experiences. These determinants place a person at greater or lesser risk for experiencing poor health outcomes including pregnancy and infant outcomes. Of particular note is the difference in infant mortality across populations.



Infant Death Rate

Despite a slight increase in 2016, the infant death rate in Linn County has remained relatively stable overtime, decreasing slightly from 4.8 infant deaths per 1,000 live births in 2011 to 4.3 deaths per 1,000 live births in 2017. Between 2015 and 2017 the combined infant death rate was 5.2 per 1,000 live births. While the infant death rate among white residents (6.1) is slightly higher than the overall rate, Black/African American residents experience a significant disparity in comparison to their white counterparts. In comparison, the infant death rate for Black/African American residents is nearly four times that of white residents with a rate of 24 per 1,000 live births. Due to the small number of infant deaths, comparison across other race and ethnic groups cannot be calculated.

Teen Birth Rate

The teen (15 to 19 years) birth rate in Linn County has decreased significantly overtime, falling from 25 births per 1,000 females aged 15 to 19 years in 2010 to 13.9 per 1,000 in 2017. As with infant deaths, Black/African American residents experience a higher rate of teen births compared to other race and ethnic groups in Linn County with a teen birth rate of 51.3 per 1,000 population. Conversely, teen births are lowest among white females with a rate of 10.8 per 1,000; lower than that of the county rate. A moderate disparity is also noted among Hispanic females with a teen birth rate of 18.9 per 1,000 population.

Late or No Prenatal Care

Nearly 1 in 5 pregnant females in Linn County either does not receive prenatal care during pregnancy or enters prenatal care after their first trimester of pregnancy. This proportion is much greater among Black/African American pregnancies, with nearly 1 in 2 receiving no or late prenatal care during pregnancy. Conversely, Asian residents are much more likely to begin prenatal care during their first trimester compared to other racial groups. Comparatively, Black/African American, Hispanic, and white females are 5.4, 3.4, and 1.9 times more likely respectively, to not receive prenatal care or to enter prenatal care late, compared to their Asian counterparts.

Maternal Smoking during Pregnancy

An estimated, 1 in 8 females in Linn County reports having smoked during pregnancy. This proportion is similar across races. However, the proportion of residents identified as “Two or More” races is slightly more likely to smoke during pregnancy (1 in 5 females) than the other race groups.

Chronic Disease

Table 7. Chronic Disease by Race, Linn County

Category	Sub-category	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino			
		Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio		
Age-Adjusted Mortality Rate per 100,000 population, 2008-2017*	All Causes of Death	682.5	679.7	2.2	887.6	2.9	303.3	✓	N/A	N/A	360.7	1.2		
	Cancer	164.1	164.0	2.1	224.0	2.8	79.5	✓	N/A	N/A	^	^		
	Heart Disease	149.1	149.1	1.8	156.7	1.8	^	^	N/A	N/A	84.9	✓		
	Chronic Lower Respiratory Disease	47.0	47.1	✓	53.7	1.1	^	^	N/A	N/A	^	^		
	Unintentional Injury	37.5	37.3	✓	50.0	1.3	^	^	N/A	N/A	^	^		
	Diabetes Mellitus	19.3	18.7	✓	54.8	2.9	^	^	N/A	N/A	^	^		
Age-Adjusted Cancer Incidence Rate per 100,000 population, 2007-2016 **	All Site	476.1	469.2	✓	471.4	1.0	N/A	N/A	N/A	N/A	N/A	N/A		
	Colon and Rectum	41.3	40.2	✓	73.6	1.8	N/A	N/A	N/A	N/A	N/A	N/A		
	Lung and Bronchus	69.5	69.4	✓	95.2	1.4	N/A	N/A	N/A	N/A	N/A	N/A		
	Female Breast	70.2	70.9	1.9	36.7	✓	N/A	N/A	N/A	N/A	N/A	N/A		
	Male Prostate	46.4	44.4	✓	59.2	1.3	N/A	N/A	N/A	N/A	N/A	N/A		
Disparity Ratio Ranges														
✓ Reference Group			● Low/No (1.0 – 1.4)			● Moderate (1.5 – 2.4)			● Significant (2.5 and higher)					

*CDC WONDER mortality database, 2008-2017 ** Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 9 Regs Research Data, Nov 2018 Sub (1975-2016) <Katrina/Rita Population Adjustment> - Linked To County Attributes - Total U.S., 1969-2017 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2019, based on the November 2018 submission. ^ Values suppressed

Chronic Disease, Continued

Category	Sub-Category	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino			
		Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio		
Chronic Disease Prevalence (Adult), 2016-2018*	Diabetes Mellitus	8.7%	8.7%	1.1	8.5%	1.1	^	^	8.2%	1.1	7.8%	✓		
	Overweight or Obese	69.1%	69.2%	1.0	66.6%	✓	71.2%	1.1	68.1%	1.0	67.7%	1.0		
	Overweight	35.8%	37.1%	3.3	11.1%	✓	41.0%	3.7	23.8%	2.1	20.9%	1.9		
	Obesity	33.3%	32.1%	1.1	55.5%	1.8	30.2%	✓	44.3%	1.5	46.8%	1.5		
	Current Asthma	8.4%	8.0%	1.1	7.5%	✓	34.0%	4.5	27.7%	3.7	13.5%	1.8		
	Coronary Heart Disease/ Angina	3.9%	4.1%	✓	6.2%	1.5	N/A	N/A	N/A	N/A	N/A	N/A		
Disparity Ratio Ranges														
✓ Reference Group			● Low/No (1.0 – 1.4)			● Moderate (1.5 – 2.4)			● Significant (2.5 and higher)					

*Behavioral Risk Factor Surveillance System **Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166; American Community Survey – 5yr estimates, 2013-2017

^Values suppressed

Deaths

Overall, the age-adjusted death rate in Linn County is 682.5 deaths per 100,000 population, with chronic diseases and injuries accounting for a majority of these deaths. Some populations in Linn County are impacted by these conditions more than others. Asian residents experience the lowest death rate compared to other race groups with a rate of 303.3 deaths per 100,000 population. Death rate among Hispanic residents is also lower in comparison to the race groups, but slightly higher than that of Asian residents. In comparison, Black/African American and white residents experience a significant disparity in death rate compared to Asian residents, with a death rate of 887.6 and 679.7 respectively.

Cancer

The leading cause of death in Linn County is cancer with an age-adjusted death rate of 164.1 deaths per 100,000 population. Similar to the overall death rate, Asian residents tend to experience a lower cancer death rate in comparison to white and Black/African American residents. While white residents have a similar cancer death rate compared to that of the overall population, white residents die at a two times higher rate in comparison with their Asian counterparts. Overall, Black/African American residents experience the highest death rate related to cancer compared to other race groups. The cancer death rate for Black/African Americans is 2.8 times (significant disparity) greater than Asian residents and 1.4 times (low disparity) greater than white residents. While comparison across races related to differences in cancer diagnosis across the leading cancer sites is limited due to small numbers, a moderate disparity for Black/African American residents is noted for incidence of colon and rectum diagnosis. Conversely, white residents demonstrated a greater incidence of female breast cancer diagnosis with a nearly two times greater incidence in comparison with Black/African American residents.

Heart Disease

Heart disease is the second leading of cause death in Linn County, with a rate of 149.1 deaths per 100,000 population. Black/African American residents tend to die at a greater rate from heart disease (156.7 per 100,000) in comparison to other race/ethnic groups. However, the rate does not differ significantly from that of white residents. Conversely, Hispanic/Latino residents experience a lower rate of heart disease deaths in comparison (84.9 per 100,000). This is nearly 2 times lower than the death rate among both Black/African American and white residents.

Diabetes Mellitus

Despite experiencing a significantly higher rate of deaths associated with Diabetes Mellitus (54.8 per 100,000), a similar percentage of Black/African American adults (8.5%) in Linn County having been diagnosed with diabetes compared to the other race categories. Conversely, deaths associated with diabetes among white residents are nearly 3 times lower than Black/African American residents and fall slightly below the overall diabetes death rate for the county.

Asthma

Black/African American (7.5%) and white (8.0%) adults in Linn County report the lowest rate of currently being diagnosed with asthma compared to other race groups, falling slightly below that of the county (8.4%). In comparison with Black/African American adults, a significant disparity in asthma diagnosis is noted for Asian (34.0%), "Two or More" races (44.3%), and Hispanic/Latino (46.8%) adults.

Mental Health

Table 8. Mental Health by Race, Linn County

Category	Sub-Category	Total	White		Black/African American		Asian		Two or More		Hispanic/Latino	
		Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio
Mental Health Status	Emergency Department Visit for Intentional Self-Harm, 2018 (Age-Adjusted Rate per 10,000)**	7.0	7.2	✓	17.0	2.4	^	^	^	^	^	^
	Emergency Department Visit for Mental Illness, 2018 (Age-Adjusted per 10,000)**	152.9	131.3	5.0	26.4	✓	^	^	129.4	4.9	103.7	3.9
	Poor Mental Health Days: 16 or more in the last 30 days, 2018*	8.9%	7.3%	1.5	35.3%	7.4	N/A	N/A	33.5%	7.0	4.8%	✓
Disparity Ratio Ranges												
✓ Reference Group	● Low/No (1.0 – 1.4)	● Moderate (1.5 – 2.4)	● Significant (2.5 and higher)									

*Behavioral Risk Factor Surveillance System **Hospitalization and emergency department data are collected by the Iowa Hospital Association on behalf of IDPH in accordance with Iowa Code section 135.166; American Community Survey – 5yr estimates, 2013-2017

^Values suppressed

Mental health issues are a significant public health concern that touches residents of all ages and races. In 2018, there were approximately 150 visits to the emergency department (ED) for intentional self-harm and more than 3,300 visits for a mental illness. Among the cases of self-harm, Black/African American residents particularly among those 15 to 24 years had the highest rate of ED visits (17 cases per 10,000) compared to white residents (7.2 per 10,000); however, Black/African American residents had the lowest rate of ED visits for overall mental illness. In comparison, white (131.3 per 10,000), “Two or More” race (129.4 per 10,000), and Hispanic/Latino (103.7 per 10,000) residents have a significantly higher rate of mental illness related ED visits. While a majority of adults in Linn County do not experience a high number of poor mental health days in a month, approximately 8.9% experience 16 or more days of poor mental health. Among those most impacted in Linn County are Black/African American (35.3%) and “Two or More” race (35.3%) adults.

Health Behaviors

Table 9. Health Behaviors by Race, Linn County

Access to Health Indicators	Total		White		Black/African American		Asian		Two or More		Hispanic/Latino	
	Rate	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	Rate	Ratio	
Binge Drinking (Adults), 2016-2018*	19.6%	19.7%	2.1	17.1%	1.8	9.5%	✓	30.3%	3.2	28.0%	2.9	
Current Smoker (Adults), 2016-2018*	18.1%	17.9%	✓	20.0%	1.1	30.2%	1.7	26.4%	1.5	21.1%	1.2	
Physically Inactive (Adults), 2016-2018*	20.1%	19.8%	1.2	29.4%	1.8	^	^	15.9%	✓	18.7%	1.2	
Incidence of Chlamydia (Age-adjusted rate per 100,000), 2018**	604.5	385.2	✓	3166.0	8.2	^	^	481.2	1.2	757.6	2.0	
Incidence of Gonorrhea (Age-adjusted rate per 100,000), 2018**	203.9	110.5	✓	1506.9	13.6	^	^	^	^	^	^	
Human Immunodeficiency Virus (HIV) prevalence (Crude Rate per 100,000)**	100.9	67.5	✓	635.2	9.4	N/A	N/A	114.0	1.7	176.7	2.6	
Disparity Ratio Ranges												
✓ Reference Group	● Low/No (1.0 – 1.4)			● Moderate (1.5 – 2.4)			● Significant (2.5 and higher)					

*Behavioral Risk Factor Surveillance System **Iowa Department of Public Health, Bureau of HIV, STD, and Hepatitis; American Community Survey – 5yr estimates, 2013-2017

N/A: Not available or Not Applicable ^Values suppressed

Many behavioral factors significantly influence the health outcomes an individual experiences. Among these high-risk behaviors is tobacco use, alcohol consumption, physical inactivity, poor diet, and unsafe sexual practices (Institute of Medicine, 2001). A majority of these factors are closely associated with increased risk for the development of high blood pressure, unhealthy cholesterol levels, type 2 diabetes, excessive body fat, and ultimately heart disease and related health conditions (National Center for Chronic Disease Prevention & Health Promotion, 2019).

Binge Drinking

Approximately, 20% of adults in Linn County report engaging in one or more episodes of binge drinking in a month. The binge drinking rate among white and Black/African American adults is similar to that of the overall county; however, Asian adults are less likely to report having engaged in binge drinking (9.5%). Alternately, the highest percentage of binge drinking is noted among adults identified as “Two or More” races (30.3%) and Hispanic adults (28%).

Current Smoker

Despite a national decrease in adult smoking, the percentage of adults in Linn County who smoke has slightly increased over the past five years. An estimated, 19.7% of adults in Linn County stated that they currently smoke in 2018; this was a nearly 3% increase from 2014. This percentage differs among certain populations. White residents have the lowest percentage of adults who smoke (17.9%), falling below the overall county percentage. In comparison, Asian adults and adults of “Two or More” races experiences a moderate disparity with a rate 1.5-1.7 times higher than their white counterparts. Black/African American and Hispanic adults smoke at a slightly higher rate than white adults; however, the difference is not significant.

Physically Inactive

Physical inactivity and sedentary lifestyles poses a significant problem globally, particularly in the United States (Knight, 2012). Physical inactivity increases the risk of the development of a myriad of diseases and health conditions, including cancer, diabetes, increased body mass, hypertension, and cerebrovascular diseases (Knight). In alignment with that of the United States, 20.1% of adults in Linn County report not having engaged in any physical activity in the previous month. This percentage increases among Black/African American adults (29.4%) with a rate nearly 2 times higher than the most active group, adults of “Two or More” races (15.9%). In comparison, white and Hispanic/Latino adults are slightly less physically active than adults of “Two or More” races, demonstrating a no/low disparity.

Sexually Transmitted Infections

Development of a sexually transmitted infection (STI) is often associated of unsafe or risky sexual behaviors (Ross, Duperrouzel, Vega, & Gonzalez, 2016). These behaviors may include inconsistent or lacking use of condoms and/or engaging in sexual activity with multiple partners. Engagement in risky sexual behaviors also increases the risk for transmission of Human Immunodeficiency Virus (HIV). Of the greatest concern in Linn County are rates associated with Chlamydia and Gonorrhea. In

2018, the age-adjusted incidence rate for Chlamydia was 604.5 per 100,000 population; this far exceeds that of the state of Iowa and differs significantly across race categories. White residents have the lowest rate of Chlamydia with a rate of 385.2. In comparison, the rate of Chlamydia among Black/African American residents is 8 times higher (3166 per 100,000) than white residents, indicating a significant disparity among this population. Hispanic/Latino residents also experience higher rates of Chlamydia (757.6 per 100,000) in comparison with white residents as well as in reference to the overall county rate.

Gonorrhea incidence in Linn County falls below that of Chlamydia; however, rates continue to increase overtime, exceeding that of Iowa. The overall age-adjusted rate of Gonorrhea in Linn County is 203.9 per 100,000. Like Chlamydia, white residents tend to have lower rates of Gonorrhea compared to their Black/African American counterparts (1506.9 per 100,000). The significant disparity is also present in relation to HIV prevalence for both Black/African American (635.2 per 100,000) and Hispanic/Latino (176.7 per 100,000) residents in comparison to white residents.

Conclusions

Health outcomes among Linn County residents differ significantly across race and ethnicity. White and Asian residents tend to experience better health outcomes compared to residents of other races. Conversely, Black/African American residents experience a greater degree of disparity across multiple indicators of health and risk. Black/African American residents are less likely to finish high school, attain an advanced degree, and receive timely prenatal care when pregnant. These residents also experience a higher teen birth rate, all death rate, die from diabetes and cancer, and incidence of sexually transmitted infections and diseases compared to residents of other race categories. See Appendix I – V for a summary of the distribution of indicators and significance of disparity noted by race group in Linn County.

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Appendix I: Health Equity at a Glance White Race

Health Outcomes Indicators		
Reference Group	High School Graduation Rates Unemployed Rates Poverty – 65+ years Living in home they own Could not see doctor due to cost Infant death rate Teen Birth Rate Chronic Lower Respiratory Disease Death Rate Unintentional Injury Death Rate Diabetes Mellitus Death Rate	All Site Cancer Incidence Colon and Rectum Cancer Incidence Lung and Bronchus Cancer Incidence Male Prostate Cancer Incidence Prevalence of Coronary Heart Disease ED Visit Rate for Self-Harm Binge Drinking Current Smoker Incidence of Chlamydia Incidence of Gonorrhea Incidence of HIV
Low/No Disparity	Median Household Income Tobacco use during pregnancy Overweight/Obesity Prevalence	Asthma Prevalence Physical Inactivity Diabetes Prevalence
Moderate Disparity	High School Drop-Out Rate Bachelor’s Degree or Higher Poverty – All ages Percent with a disability Uninsured Rate Prenatal Care	All Cause of Death Rate Heart Disease Death Rate Cancer Death Rate Female Breast Cancer Incidence Poor Mental Health Days – 16+ days
Significant Disparity	Poverty - Children <18 years	ED Visit Rate for Mental Illness

Appendix II: Health Equity at a Glance – Black/ African American

Health Outcomes Indicators	
Reference Group	<p>Tobacco use during pregnancy Female Breast Cancer Incidence Overweight/Obesity Prevalence</p> <p style="text-align: right;">Asthma Prevalence ED Visit Rate for Mental Illness</p>
Low/No Disparity	<p>High School Graduation Rates Chronic Lower Respiratory Disease Death Rate Unintentional Injury Death Rate All Site Cancer Incidence</p> <p style="text-align: right;">Lung and Bronchus Cancer Incidence Male Prostate Cancer Incidence Diabetes Prevalence Current Smoker</p>
Moderate Disparity	<p>Median Household Income Poverty – 65+ Living in home they own Percent with a disability Uninsured Rate Could not see doctor due to cost</p> <p style="text-align: right;">Heart Disease Death Rate Colon and Rectum Cancer Incidence Prevalence of Coronary Heart Disease ED Visit Rate for Self-Harm Binge Drinking Physical Inactivity</p>
Significant Disparity	<p>High School Drop-Out Rate Bachelor’s Degree or Higher Unemployed Rates Poverty – All ages Poverty - Children <18 years Infant death rate Teen Birth Rate Prenatal Care</p> <p style="text-align: right;">All Cause of Death Rate Cancer Death Rate Diabetes Mellitus Death Rate Poor Mental Health Days – 16+ days Incidence of Chlamydia Incidence of Gonorrhea Incidence of HIV</p>

Appendix III: Health Equity at a Glance – Asian

Health Outcomes Indicators	
Reference Group	High School Drop-Out Rate Bachelor’s Degree or Higher Median Household Income Poverty – All ages Poverty - Children <18 years Percent with a disability Uninsured Rate Prenatal Care All Cause of Death Rate Cancer Death Rate Binge Drinking
Low/No Disparity	Overweight/Obesity Prevalence
Moderate Disparity	Unemployed Rates Living in home they own Current Smoker
Significant Disparity	Asthma Prevalence

Appendix IV: Health Equity at a Glance – Two or More Races

Health Outcomes Indicators		
Reference Group	Physical Inactivity	
Low/No Disparity	High School Graduation Rates Diabetes Prevalence	Overweight/Obesity Prevalence Incidence of Chlamydia
Moderate Disparity	Bachelor’s Degree or Higher Unemployed Rates Median Household Income Living in home they own Percent with a disability	Could not see doctor due to cost Prenatal Care Tobacco use during pregnancy Current Smoker Incidence of HIV
Significant Disparity	High School Drop-Out Rate Poverty – All ages Poverty - Children <18 years Uninsured Rate	Asthma Prevalence ED Visit Rate for Mental Illness Poor Mental Health Days – 16+ days Binge Drinking

Appendix V: Health Equity at a Glance – Hispanic/Latino

Health Outcomes Indicators		
Reference Group	Heart Disease Death Rate Diabetes Prevalence	Poor Mental Health Days – 16+ days
Low/No Disparity	High School Graduation Rates Living in home they own Unemployed Rates Tobacco use during pregnancy Physical Inactivity	All Cause of Death Rate Overweight/Obesity Prevalence Current Smoker
Moderate Disparity	Bachelor’s Degree or Higher Median Household Income Poverty – All ages Poverty – 65+ Living in home they own	Percent with a disability Could not see doctor due to cost Teen Birth Rate Incidence of Chlamydia Asthma Prevalence
Significant Disparity	High School Drop-Out Rate Poverty - Children <18 years Uninsured Rate Prenatal Care	ED Visit Rate for Mental Illness Binge Drinking Incidence of HIV