THE HEALTH OF LINN COUNTY, IOWA
A COUNTYWIDE ASSESSMENT OF HEALTH STATUS AND HEALTH RISKS

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Linn County, Iowa
Chapter 10 Risk and Protective Factors

Introduction
Though not all factors influencing health can be altered, there are factors that have an impact on health which can be modified. Chapter 10 describes and discusses leading individual behaviors that can be a determinant of health, including behaviors such as tobacco use, alcohol use, transportation, physical activity, nutrition, sexual behavior, and receiving immunizations. These behaviors play a role in the development and prevention of chronic and infectious diseases, but are all also controllable and changeable.\(^{73}\) With an estimated 75% of healthcare costs attributed to chronic disease management, preventive measures focusing on changing lifestyle choices can be hugely important in the cost effective care of the population’s health.\(^{74}\) It is estimated up to 40% of deaths from the five leading causes of death are preventable.\(^{75}\) The Centers for Disease Control and Prevention estimated that 23% of heart disease, 16.4% of cancer, 45.5% of chronic lower respiratory disease, 13% of stroke, and 38.1% of unintentional injury deaths in 2014 were preventable (Figure 10.1).\(^{76}\) These preventable deaths can be avoided by addressing the social determinants of health covered in previous chapters in combination with modifying individual behaviors discussed in this chapter.


Chapter 10 Risk and Protective Factors
Figure 10.1 Potentially preventable deaths as a percentage of total deaths for five leading causes of death, Iowa, 2014


Tobacco Use and Exposure
Tobacco use is the leading preventable cause of death in the nation and causes more than six million deaths per year worldwide.\textsuperscript{77} Smoking is a risk factor for four of the five leading causes of death. Smoking causes cancer, heart disease, stroke, lung diseases (including emphysema, bronchitis, and chronic airway obstruction), and diabetes.\textsuperscript{78}

Linn County 2020 Goals
Reduce the percentage of adults who currently smoke cigarettes to 7.1%, a 58% decrease from 17.0% in 2010.

Reduce the proportion of adolescents who have smoked cigarettes in the past 30 days to 5.5%, an 8.0% reduction from 6.0% of adolescents who reported smoking cigarettes in the past 30 days in 2010.


Chapter 10 Risk and Protective Factors
Trends
Overtime, the proportion of population who currently smoke in Linn County has declined from 22.5% in 2011 to 15.9% in 2016 (Figure 10.2). The proportion of current adult smokers in Linn County was similar to that of the United States (17%) and Iowa (16.7%) in 2016. During this period, the greatest proportion (54.9%) of adults in Linn County report never having been a smoker, an increase of approximately 2% between 2011 and 2016 (Figure 10.3).

Figure 10.2 Percent of adult population reporting currently smoking, Linn County, Iowa and United States, 2011-2016

Figure 10.3 Smoking statuses of Linn County adults, 2011-2016

Source: BRFSS

Chapter 10 Risk and Protective Factors
The Behavioral Risk Factor Surveillance System (BRFSS) defines smokers as people who reported smoking at least 100 cigarettes in their lifetime. A rising majority of these respondents report being former smokers, who do not currently smoke. There has additionally been a steady decline in those reporting smoking every day (Figure 10.4).

**Figure 10.4 Smoking frequency among Linn County smokers, 2011-2016**

In 2016, only 1% of Linn County adolescents reported smoking any cigarettes in the past 30 days. This is lower than the rates reported for Iowa and the United States. It also marks the lowest rate of cigarette use among adolescents in Linn County after a continued downward trend in the past decade (Figure 10.5). The decrease in adolescent smoking from 1999 to 2016 is statistically significant. The adolescent smoking rate in 2016 surpasses the Linn County 2020 goal.

**Figure 10.5 Percentage of adolescents reporting cigarette use in the past 30 days**

Chapter 10 Risk and Protective Factors
Disparities

Sex
From 2014 to 2016, adult women had lower rates of ever smoking compared to men with 58.6% of females reporting never smoking, compared to 48.5% of males (Figure 10.6). A greater percentage of males are former and daily smokers with 28.6% of males reporting being former smokers and 14.8% smoking daily.

Figure 10.6 Self-reported smoking statuses by gender, Linn County, 2014-2016

Education
Disparities in smoking levels are observed when looking at the population by education level. Rates of smoking every day decrease with higher levels of education with 21.9% of adults who have not graduated high school smoking every day compared to only 2.2% of adults with four or more years of college (Figure 10.7). Likewise, the highest percentage of adults who report never smoking is among those with a four or more year degree with 73.3% of this population group never having smoked.
Figure 10.7 Self-reported smoking statuses by education level, Linn County, 2014-2016

Source: BRFSS

Age

Differences in smoking statuses are seen when looking at separate age groups. Individuals over the age of 45 years are more likely to be former smokers compared to those under 45 years of age (Figure 10.8). The group with the highest percentage of former smokers is the 45 to 54 year old group at 50%. The group with the highest percentage of never smoking is the 18 to 24 year olds at 77.7%. Finally, the group with the highest frequency of use is among 25 to 34 year olds with 18.2% of adults in this age group reporting smoking daily.

Figure 10.8 Self-reported smoking statuses by age, Linn County, 2014-2016

Source: BRFSS
Alcohol Abuse
Excessive alcohol use is the 3rd leading lifestyle related cause of death. Excessive alcohol use includes binge drinking, heavy drinking, and any drinking by pregnant women or people younger than age 21. Excessive alcohol use has short-term and long-term health risks.

Short-term risks from excessive alcohol use include: motor vehicle injuries, falls, drowning, burns and unintentional firearm injuries; intimate partner and child maltreatment violence; risky sexual behaviors including unprotected sex, sex with multiple partners, and increased risk of sexual assault; miscarriage or stillbirth among pregnant women, lifelong physical and mental birth defects; and alcohol poisoning.

Long-term risks from excessive alcohol use include: Dementia, stroke, neuropathy or other neurological problems; cardiovascular problems; depression, anxiety, suicide or other psychiatric problems; social problems such as unemployment, lost productivity or family problems; increased cancer risk, especially cancer of the mouth, throat, esophagus, liver, colon and breast; liver diseases such as alcoholic hepatitis, cirrhosis, and worsening liver function among persons with Hepatitis C; and gastrointestinal problems, including pancreatitis and gastritis.

Linn County 2020 Goals
Reduce the percentage of adults who report binge drinking during the last 30 days to 14.6%. This represents a 10% reduction from the 16.2% of adults who reported binge drinking in a 2010 survey.

Reduce the percentage of adolescents who report binge drinking during the last 30 days from 10% in 2010 to 9%. This represents a 10% reduction from the 9% of 6th, 8th, and 11th graders who reported binge drinking in the 2010 Iowa Youth Survey for Linn County.

Trends
In 2016, 19.1% of adults in Linn County reported binge drinking in the previous 30 days (Figure 10.9). Between 2011 and 2016, the proportion of adults reporting binge drinking decreased slightly. However, over this period fluctuation was noted. The percentage of adults who are binge drinking is currently similar to the state rate, but greater than the national rate.

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Between 1999 and 2016, the proportion of adolescents in 6th, 8th, and 11th grade in Linn County who reported at least one occurrence of binge drinking decreased from 15% in 1999 to 4% in 2016, a statistically significant decrease (Figure 10.10). Adolescents in Linn County tend to report less binge drinking behavior compared to adolescents in Iowa and the United States. The current percentage of adolescents who engage in binge drinking in Linn County is better than the identified Linn County 2020 goal.
Disparities

Race and Gender

When binge drinking is compared in terms of race and gender, two distinct disparities are seen. Males of both races are more likely to engage in binge drinking compared to their female counterparts with 27.8% of males and 9.5% of females reporting binge-drinking behavior within a month (Figure 10.11). Additionally, white residents are nearly 3 times as likely to engage in binge drinking compared to their black counterparts (20.4% vs. 7.1%, respectively). For both white and black race categories, males reported higher rates of binge drinking than females. While 29.2% of white males reported binge drinking, only 12.9% of white females reported binge drinking. Among black residents, 23.1% of males compared to 0% of females had binged.

Figure 10.11 Percentage of adults reporting binge drinking behaviors by race and gender, Linn County, 2014-2016

Source: BRFSS
Age
A trend is also observed when comparing rates of binge drinking by age group in Linn County. Persons aged 25 to 34 years old reported the highest rate of binge drinking at 32.4% from 2014-2016 (Figure 10.12). As individuals age, the percent who engage in binge drinking declines with individuals older than 65 years of age having the lowest proportion (3.4%) of binge drinking compared to the other age groups.

Figure 10.12 Percentage of adults reporting binge-drinking behaviors by race and gender, Linn County, 2014-2016

Source: BRFSS
Transportation

Access and use of differing types of transportation contribute to health status in a variety of ways. For the past 50 years, communities and transportation systems have been designed around automobile use. For this reason, access to automobiles in communities that have been built for automobile use influence access to health care, nutritious foods, schools and workplaces. However, automobile use by individuals traveling alone has the greatest negative impact on health in terms of active living, air quality and motor vehicle crashes. By examining rates of commuting methods, transportation choices among different communities can be compared.

In Linn County, 83.5% of the workforce over 16 years of age commutes to work alone (Table 10.1). This proportion is greater than the rate of Iowa and the United States. The proportion of alternative commuting methods is lower than Iowa and the United States among public and active (i.e. walking and bicycling) transportation methods. Linn County has a greater proportion of the population that walk to work than Iowa or the United States and a slightly lower proportion of commuters that bicycle to work when compared to the national rate. Bicycling to work among Linn County commuters is lower than the national percentage, but the same as the state (Table 10.1). While commuters are more likely to drive alone to work, there are a greater proportion of workers that work at home and the mean commute time is less than the average commute time for Iowa or United States workers.

Table 10.1 Commuting type and time to work among workers 16 years old and over, Linn County, Iowa and United States, 2016

<table>
<thead>
<tr>
<th>Commuting Method</th>
<th>Linn County</th>
<th>Iowa</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car, truck, or van - drove alone</td>
<td>83.5%</td>
<td>81.2%</td>
<td>76.3%</td>
</tr>
<tr>
<td>Car, truck, or van - carpooled</td>
<td>9.1%</td>
<td>8.2%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Public transportation</td>
<td>0.7%</td>
<td>1.1%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Walked</td>
<td>2.0%</td>
<td>3.4%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0.3%</td>
<td>0.5%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Taxicab, motorcycle or other means</td>
<td>1.0%</td>
<td>0.9%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Worked at home</td>
<td>3.4%</td>
<td>4.7%</td>
<td>5.0%</td>
</tr>
<tr>
<td><strong>Mean travel time to work (minutes)</strong></td>
<td><strong>19.0</strong></td>
<td><strong>19.0</strong></td>
<td><strong>26.6</strong></td>
</tr>
</tbody>
</table>

Source: 2016 American Community Survey 1-yr estimates

Physical Activity

Regular physical activity helps improve overall health and reduces the risk for many chronic diseases including: cardiovascular disease, type 2 diabetes, and some cancers. Physical activity can help maintain a healthy weight, strengthen bones and muscles, improve mental health and mood, prevent falls among older adults and increase the chances of living longer. According to the 2008 Physical Activity Guidelines for Americans, aerobic and muscle-strengthening physical activity is needed each week to improve health. These guidelines outline three possible combinations of both aerobic and strength-training activities necessary to ensure health benefit. It is recommended that adults engage in at least:

- 150 minutes of moderate intensity aerobic activity and 2 or more days of full-body muscle strengthening activities per week
- 75 minutes of vigorous-intensity aerobic activity and 2 or more days of full-body muscle strengthening activities per week
- An equivalent mix of moderate and vigorous activity and 2 or more days of full-body muscle strengthening activities per week

Adult Physical Activity

Linn County 2020 Goal

Increase the proportion of adults who meet both the aerobic and strength guidelines to 18.3%. This is a 10% increase from the 16.6% of adults who met both aerobic and strengthening guidelines in 2011.

Trends

In 2015, 16.3% of Linn County adults met the aerobic and muscle-strengthening guidelines, a decrease from 2013 and similar to that of 2011 with 17.3% and 16.6% of the adult population meeting both recommendations, respectively (Figure 10.13). Conversely, between 2011 and 2015 the proportion of adults in Iowa who met both recommendations increased from 17.2% in 2011 to 19.4% in 2015. Compared to Iowa, Linn County residents have a greater percentage of the population that has access to exercise opportunities (parks or recreation facilities) at 87% compared to 76% (Table 10.2).

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Chapter 10 Risk and Protective Factors

Figure 10.13 Percentage of adults who met aerobic and strength guidelines, Linn County and Iowa, 2011-2015

Table 10.2 Access to exercise opportunities, Linn County and Iowa; 2010 & 2014

<table>
<thead>
<tr>
<th>Access to exercise opportunities</th>
<th>Linn County</th>
<th>Iowa</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>87%</td>
<td>76%</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: 2017 County Health Rankings

Disparities

Age

Over all of the age groups, individuals 18 to 24 years of age were most likely to meet both the aerobic and strength-training guidelines with 26.8% of the population meeting both guidelines (Figure 10.14). The least likely to meet both guidelines were among individual 55 to 64 years of age, with only 11.3% of the population meeting both guidelines.
Education
As the level of education among adults in Linn County increases so does the level of physical activity (Figure 10.15). Individuals having earned a Bachelor’s degree or higher were more likely than those at lower levels of education to meet both aerobic and strength-training guidelines, with 28.8% of individuals with a Bachelor’s or higher level degree meeting the guidelines compared to 7.4% of those having attained less than a high school degree. Likewise, those with at least a high school degree were twice as likely to meet both guidelines.

Figure 10.15 Percentage of adults who met aerobic and strength guidelines by education, Linn County, 2011-2015

Source: BRFSS

Adolescent Physical Activity

Linn County 2020 Goal
Increase the proportion of adolescents who meet the current physical activity guidelines to 34.1%, a 10% increase over the 31% of adolescents who reported exercising for at least 1 hour a day in 2010.

Trends
From 2008 to 2016, Linn County has seen a slight increase in the percentage of adolescents who reported getting at least one hour of physical activity every day of the week, from 25% in 2008 to 29% in 2016. This is a slower growth than the state of Iowa, which went from 25% in 2008 to 31% in 2016 (Figure 10.16).
Figure 10.16 Percentage of 6th, 8th, and 11th graders who reported getting at least 1 hour of physical activity every day of the week

Disparities

Sex

In 2016, a difference in level of physical activity among male and female adolescents was observed. Overall and at every grade level, boys report getting more regular exercise than girls. For all grades combined, 29% of students reported getting at least one hour of exercise each day, with 36% of males and 22% of females reporting regular exercise (Figure 10.17).

Figure 10.17 Percentage of 6th, 8th, and 11th graders who reported getting at least 1 hour of physical activity every day of the week by gender, 2016

Source: Iowa Youth Survey

Chapter 10 Risk and Protective Factors
Nutrition
One indicator of sufficient and healthy nutrition is the amount of fruits and vegetables a person eats on a daily basis. Fruits and vegetables are sources of essential vitamins and minerals, as well as fiber and other substances important for healthy bodies. According to the CDC, diets rich in fruits and vegetables may reduce the risk of cancer and other chronic diseases.\(^84\)

Trends
In 2015, 36.7% of adults in Linn County reported consuming less than one serving of fruit a day, where 20.9% reported consuming less than one serving of vegetables daily. This is a slight decrease from 2011 where 39.3% and 25.2% of adults reported consuming less than one serving of fruits and vegetables a day, respectively (Figure 10.18).

Figure 10.18 Percent of adults in Linn County who reported consuming less than 1 serving of fruits or vegetables per day, 2011-2015

Source: BRFSS

In 2016, a survey of 6th, 8th, and 11th graders of Linn County asked how many times a day a student usually ate either fruits or vegetables. The most common response was one to four fruits (76%) and one to four vegetables (72%) a day. Only 7% of students taking the survey reported eating 5 or more fruits and 5% reporting eating five or more vegetables a day, while 6% of students stated that they ate no fruits and 8% stated they did not eat any vegetables (Figure 10.19).

Figure 10.19 Number of times per day that fruits or vegetables were eaten by 6th, 8th, and 11th graders in Linn County, 2016

<table>
<thead>
<tr>
<th>Times per day</th>
<th>Fruits</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Less than One</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>One to Four</td>
<td>76%</td>
<td>72%</td>
</tr>
<tr>
<td>Five or More</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Source: Iowa Youth Survey

Disparities

Marital Status

While inadequate consumption of fruits was similar across sexes and marital status, a difference was present in vegetable consumption. Overall, adults were less likely to consume fruits than vegetables. However, a higher percentage of unmarried adults reported lower vegetable consumption compared to their married counterparts.

Chapter 10 Risk and Protective Factors
Figure 10.20).
Figure 10.20 Percentage of adults who consume less than one serving of fruits and vegetables per day by Sex and Marital Status

*Includes divorced, widowed, and never married

Source: BRFSS

**Age**

The largest proportion of adults who do not consume one or more servings of fruits were among adults aged 45 to 54 (57.4%) and those 18 to 24 years (46%). The lowest percentage of vegetable consumption occurred among individuals aged 18 to 24 years. However, as individuals age, consumption of both fruits and vegetables tends to improve (Figure 10.21).

Figure 10.21 Percentage of adults who consume less than one serving of fruits and vegetables per day by age group, Linn County, 2015

Source: BRFSS
Household Income

There was some variation in consumption patterns over the income levels; however, for the most part the variation was slight (Figure 10.22). However, fruit and vegetable consumption appeared to increase with higher income. Individuals making less than $15,000 per year had the highest percent of low consumption of fruits compared to the other groups; but the percentage did not differ significantly from the other income groups.

Figure 10.22 Percentage of adults who consume less than one serving of fruits and vegetables per day by income level, Linn County, 2013 and 2015

Source: BRFSS
Food Insecurity and Food Deserts

Food insecurity, according to the U.S. Department of Agriculture (USDA), refers to a lack of access to enough foods for an active, healthy life for all within a household and limited or uncertain availability of nutritionally adequate foods. Food insecurity threatens the intake of nutrients that are essential to growth and development. These nutrients are especially vital within the first 3 years of life, as they can affect the individual’s long-term health outcomes. A person can be food insecure and obese or overweight, since food insecurity has to do with having limited or uncertain access to adequate food.

Linn County 2020 Goal
Reduce food insecurity among children to 15.7%, a 6% decrease from 16.7% of children who were food insecure in 2010.

Trends
In 2015, approximately 12% of the entire population of Linn County was food insecure (Figure 10.23). Overtime, the rate of food insecurity in Linn County has remained relatively stable; and continues to be more favorable than the national rate of approximately 15%. Similarly, the rate of food insecurity among children in Linn County (16.3%) is less than that of Iowa (17.8%) and the United States (20.9%). Overall, there has been some fluctuation in the food insecurity rate among children (Figure 10.24). However, the percentage of food insecure children in Linn County, Iowa, and United States is currently on a downward trend.

Figure 10.23 Percent of the total population who are food insecure, Linn County, Iowa and United States, 2009-2015

Source: Feeding America Map the Meal Gap


Chapter 10 Risk and Protective Factors
Figure 10.24 Percent of Children who are Food Insecure in Linn County, Iowa, and United States; 2009-2015

Source: Feeding America Map the Meal Gap

Disparities
According to the USDA, a food desert is defined as a low-income area with low access to a super market or grocery store. Access to a grocery store or super market is considered low when the nearest store is more than 1 mile away from an urban location or more than 10 miles from a rural location. In 2015, approximately 32% of the Linn County population were considered to have low access to a grocery store of super market (Table 10.3). An estimated 16,182 households or 7.7% of the Linn County population lived in a food desert (low access and low-income). Of the total population with low access, 11.2% were children, 3% were seniors, and 0.6% were households without a personal mode of transportation.

Table 10.3 Population groups with low access to grocery store, Linn County, 2015

<table>
<thead>
<tr>
<th>Group</th>
<th>Percent of total county population</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>32.0</td>
<td>67,561</td>
</tr>
<tr>
<td>Children</td>
<td>11.2</td>
<td>23,585</td>
</tr>
<tr>
<td>Seniors</td>
<td>3.0</td>
<td>6,254</td>
</tr>
<tr>
<td>Low income (Food desert)</td>
<td>7.7</td>
<td>16,182</td>
</tr>
<tr>
<td>Households with no car</td>
<td>0.6</td>
<td>1,321</td>
</tr>
</tbody>
</table>

Source: United States Department of Agriculture Food Environment Atlas

Chapter 10 Risk and Protective Factors
Breastfeeding
Breastfeeding has been shown to greatly benefit infants and mothers by decreasing illness in the infant and lowering risk of type 2 diabetes, breast and ovarian cancer, and postpartum depression among mothers. Additionally, breastfeeding can save money and improve the mood of the mother and baby.87

Linn County 2020 Goals
Increase the proportion of breastfeeding infants to 75.7% from 68.8% reported in 2010. This increase represents the continued upward trend analyzed for Linn County.

Trends
In Linn County, the percentage of infants who were ever breastfed increased from 64.4% in 2007 to 87.6% in 2016 (Figure 10.5). The current percentage of infants who are breastfed at birth surpasses that of Iowa and the Linn County 2020 goal. However, overtime Iowa has typically had higher breastfeeding rates compared to Linn County. The increase in breastfeeding from 2007 to 2016 among Linn County infants was a statistically significant change.

Figure 10.25 Percentage of infants who are breastfed at birth, Linn County and Iowa 2007-2016

Source: Iowa Public Health Tracking Portal

While over three quarters of infants were ever breastfed, less than half are still breastfed at 6 months of age, and 15.6% are exclusively breastfed at 6 months of age (Figure 10.6).

**Figure 10.26 Ever and sustained breastfeeding, Iowa and United States, 2014**

![Chart showing breastfeeding rates](chart.png)

*Source: Centers for Disease Control and Prevention, National Immunization Survey*
**Immunizations**

Immunization against vaccine-preventable diseases is important to reduce morbidity and mortality caused by those diseases. Vaccines prevent disease within individuals, but also entire communities, as diseases cannot spread in the community if there are people that are immune to the disease and cannot become infected with the disease if exposed.

**Linn County 2020 Goals**

Increase the proportion of 2 year olds that are up to date in their vaccination schedule to 90%. This meets national vaccination standards.

Increase the proportion of adults aged 65 years and older that have received a pneumococcal vaccine to 90%. This reflects national regulations, policies, and laws.

**Trends**

In 2016, 67% of Linn County 2 year-olds were up to date on the 4-3-1-3-1-4 series (4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 Hep B, 1 Varicella, and 4 PCV), a decrease from the previous report of 74% in 2013 (Figure 10.). Iowa has a slightly higher percentage of 2 year-olds who are up to date on all needed vaccinations, with 69% of Iowa 2 year-olds up to date on the same series in 2016. Out of the seven immunizations recommended, the Iowa Immunization Registry Information System (IRIS) reflects that Linn County currently falls below the Linn County 2020 goal of 90% coverage for all recommended immunizations. (Figure 10.27)

**Figure 10.27 2-year-old immunization rates, percent up to date, Linn County and Iowa, 2010-2016**

![Graph showing immunization rates from 2010 to 2016](image)

*Source: Iowa Immunization Program Annual Reports, 2010-2016*
In 2016, the pneumococcal vaccination rates for adults ages 65 and older in Linn County was 76.1%, an increase 58.7% in 2011 (Figure 10.29). While improvement has been noted overtime, the percentage of adults 65 years of age or older who are vaccinated for pneumonia still falls below the Linn County 2020 goal of a 90% vaccination rate.

**Figure 10.29 Pneumococcal vaccination rates in 65+ year-olds, Linn County, Iowa, and United States, 2011-2016**

*Source: BRFSS*
Disparities

**Sex and Marital Status**

Overall, married adults 65 years of age or older have a higher vaccination rate for pneumonia compared to unmarried adults of the same population (Figure 10.30). Married men tend to have the highest percentage of vaccinations accounting for 59.6% of all males 65 years of age or older who are vaccinated for pneumonia, compared to 22.9% who are unmarried. Conversely, within Linn County’s female population 65 years of age or older unmarried females have a higher percentage of vaccination compared to those who are married (45% vs. 34.7%, respectively).

**Figure 10.30 Rates of pneumococcal vaccination in 65+ year-olds by marital status, 2014-2016**

Source: BRFSS
Summary
Chapter 10 covered a wide variety of risk and protective factors that can affect health outcomes and identified some notable trends and disparities. The proportion of adults and adolescents who current smoke have declined overtime. Conversely, the proportion of adults who report never smoking or being a former smoker has increased slightly between 2011 and 2016. Likewise, the proportion of residents who report binge drinking has improved slightly for adults and significantly for adolescents. However, the greatest disparity in binge drinking behavior continues to occur among males compared to females by nearly three-fold and tends to occur at a higher rate among white males. While the highest proportion of individuals who report binge drinking is among those 25 to 34 years of age, the proportion decreases as one ages.

Linn County has a higher percentage of commuters that drive alone to work than Iowa or the United States; however, the mean commute time is shorter than the United States and similar to Iowa. Adult populations most likely to engage in an adequate level of physical activity, as defined by meeting aerobic and strength training guidelines, are adults 18 to 24 years of age and those with at least a Bachelor’s level degree. Among adolescents, males get more physical activity than females in all age groups analyzed. The proportion of adults who consume less than one serving of fruits and vegetables a day decreased slightly from 2011 to 2015. The lowest percentage of fruit consumption occurred among individuals 45 to 54 years of age, where individuals 18 to 24 years accounted for the lowest percentage of vegetable consumption compared to other age groups. Fruit and vegetable consumption tended to increase with income. The majority of adolescents in reported eating between 1 and 4 servings of fruit or vegetables daily. The percentage of food insecure individuals and children also decreased overtime. However, the percentage of food insecure children has decreased at a greater rate than the population as a whole.

From 2007 to 2016, the percent of infants ever breastfed increased and surpassed the state in 2016. Lastly, immunization coverage among 2 year olds in Linn County in 2016 was similar to that in 2010. However, the percentage of 2 year olds fully covered is significantly less than 2013, a difference of 10% during this time. Currently, none of the seven vaccinations in the series is at the goal of 90% of the child population receiving the vaccine. The proportion of the population aged 65 years and older that has ever received pneumococcal vaccine increased from 2011 to 2016. Married males 65 years of age and older were the most likely to have received the pneumococcal immunization.