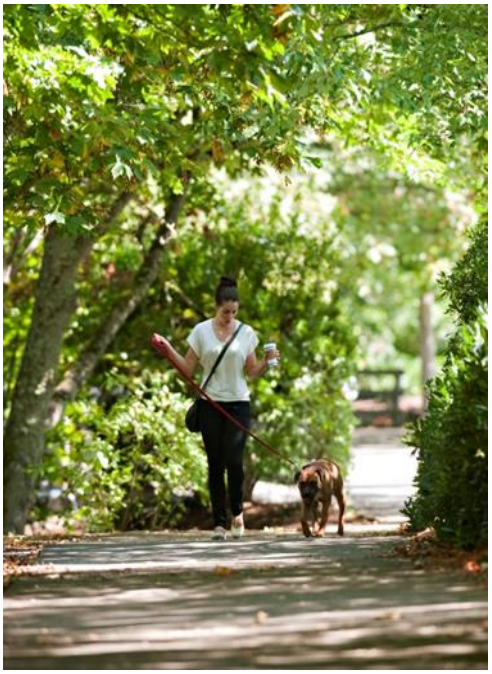
Samaritan Albany General Hospital

2016 Community Health Needs Assessment



Samaritan Health Services

Samaritan Albany General Hospital

Project Team (alphabetical):
Peter Banwarth, MS
Valerie Barnhill, MPH Intern
Miyuki Blatt, MPH Intern
Ann Brown, MBA
Savannah Carrico, MPH intern
Andy Chuinard, MPH
Jessica Deas, MPH
Gerald Dyer, MPH
Charlie Fautin, MPH, RN
Brandan Kearny, Consultant
Ruby Kiker, MPH
JoAnn Miller, MS
Megan Patton-Lopez, PhD, RD
Whitney Schumacher, MPH intern
Lauren Zimbelman, MPH

For Further Information
Samaritan Health Services
Community Health Promotion
JoAnn Miller, Director
815 NW 9th Street
Corvallis, OR 97330
541-758-7330
jomiller@samhealth.org

Regional Health Assessment
530 NW 27th St.
Corvallis, OR 97339
LBLRHA@co.benton.or.us
541-766-3547
Fax: 541-766-6142

Table of Contents

Chapter 1
Introduction and Overview

Samaritan Albany General Hospital

Samaritan Albany General Hospital (SAGH) has been providing care to area residents since 1924. SAGH is a 79-bed acute care facility and health center providing medical services to the greater Albany area. Based in the heart of the beautiful Willamette Valley, SAGH is part of Samaritan Health Services, an award-winning network of hospitals, physician clinics, health plans, health and fitness centers, a hospice house, and a senior care facility primarily serving Benton, Lincoln and Linn counties. SAGH employs over 132 health care providers, more than 700 support staff and close to 260 clinic employees serving the health needs of the community.

As a non-profit hospital, we are committed to our motto "building healthier communities together."

The 2016 Samaritan Albany General Hospital Community Health Needs Assessment (CHNA) is the result of many dedicated hours of research, working in collaboration with community partners and agencies, leaders, and local residents in West Linn County.

The World Health Organization defines health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[1] Health is not just about individuals, but also includes families, communities, and systems, and is a result of the interaction of complex networks of conditions and factors. Health starts long before illness occurs and is impacted by where and how we live, learn, work, play, worship and age.

This CHNA incorporates this definition of health by describing a wide array of information about the conditions and factors affecting people's health across West Linn County as well as indicators of health status.

Assessment Goals and Objectives

The Samaritan Albany General Hospital Community Health Needs Assessment (CHNA):

- Identifies and gathers health status indicators in order to determine the current health status of the West Linn community;
- describes areas for potential future health improvement while building upon ongoing community knowledge and efforts;
- recognizes and highlights the need for more detailed local data; and
- is a collaborative process that incorporates a broad range of community voices.

CHNA data informs Samaritan Albany General Hospital's organizational decision-making, the Samaritan Albany General Hospital's Community Benefit Implementation Plan, and other community and hospital efforts.

Needs Assessment Organization

The Community Health Needs Assessment is presented in eight chapters. An appendix of key informant interviews, focus groups, and survey results is available as a separate document.

Chapter 1: *Introduction and Overview*, including methodology and limitations.

Chapter 2: *People,* describing the people of west Linn County, including population demographics as well as a look at how the community has changed over time.

Chapter 3: *Environment*, which includes information about the physical spaces in which we live, work, and play.

Chapter 4: *Social Determinants of Health,* which includes the social, economic, and community factors that influence health.

Chapter 5: *Access to Medical Care*, exploring how we define and measure the ability of those in our community to get the medical care they need.

Chapter 6: *Morbidity and Mortality,* which covers a number of related health outcomes, from chronic conditions to violence and injury.

Chapter 7: *Health Across the Life Course*, exploring the ways in which individuals and communities act to protect and improve health at different stages in life.

Chapter 8: *Conclusion: Meeting Challenges with Resources,* discussing how this data can be used to understand the health of west Linn County and recognize opportunities for positive changes to improve the health of the entire community.

Appendix (separate): *Community Perceptions on the Health of west Linn County,* reporting on the results of key informant interviews, focus groups, and a community survey on perceptions of the health of the community.

Methodology

The CHNA is comprised of secondary and primary data. Data from secondary sources were identified through meeting with community partners, and through preexisting publications (e.g. community health assessments). In addition, data sources were identified through literature research to include data from local state and national levels. A variety of community partners were involved throughout this process. Staff conducted both in-person and phone presentations and consultations with members of regional and county-level governmental,

nonprofit, and health system organizations. In addition, members of state and local research communities were contacted.

This process has included:

- Engaging community stakeholders and partners in the process of issue identification, data collection, data interpretation, editing, and dissemination of results;
- obtaining updated secondary data for west Linn County
- synthesizing existing data reports; identifying areas in which more information is needed, and including data from other sources which address these gaps;
- identifying health needs and assets that will inform additional local planning processes, including county-level Community Health Improvement Plans, Public Health Division strategic planning, public health accreditation, and health care transformation initiatives, among others; and
- consulting state and national resources for guidance in the development of this community health assessment, including the following: Oregon Health Authority technical reports (e.g. health equity,[2] asthma,[3] chronic disease prevention[4]); the Centers for Disease Control and Prevention's data set directory of social determinants of health at the local level;[5] King County's Equity and Social Justice Annual Report;[6] and the Statewide Health Assessment of Minnesota.[7]

Limitations

While the CHNA identifies many critical issues pertaining to community health, it is not inclusive of all health-related issues. As a result, it should not be considered a formal study or research document investigating the causes of each issue raised or providing a detailed analysis of the data.

When considering the many factors that contribute to health, data are lacking in part because respective theoretical models are still being developed. In addition, conclusions, hypotheses, and interpretations of the interactions between the many factors that contribute to health may not be included, in part because the underlying structures of these interactions are still not fully understood.

Gaps in Data

Recognizing and highlighting the need for more detailed local data was a key objective of this assessment. As mentioned throughout the document, data for west Linn County were often not available for particular demographics, such as age, income, education-level, race/ethnicity, or zip code. This greatly limited the ability to explore differences or disparities within particular sub-populations.

When race/ethnicity data are gathered, analysis may be further limited due to a lack of data stratification by more specific racial categories, such as U.S.-born versus foreign-born for the

Latino population, or the many ethnicities and cultures represented in the category of Asian-Pacific Islander. There are limited data on disparate populations in the community; however, as highlighted in later chapters, their needs and barriers to health and health care are likely to be greater than those of the population at large.

Throughout the document, Oregon state-wide data are provided to illustrate trends, especially among vulnerable populations, when county level data are not available. It is important to note, however, that national or state-wide rates, trends, and patterns may not necessarily reflect the reality of particular communities or counties. As community partners continue to gather information to inform their practices and services, it is important to collect demographic data (i.e. zip codes, level of education, etc.) so that more accurate information can be used to inform future health improvement planning and other public health initiatives.

How to Use This Document

West Linn County versus Linn County

Samaritan Albany General Hospital serves the people of west Linn County, comprising the communities of Albany, Millersburg, Tangent, Shed, Halsey, and Harrisburg, as well as unincorporated and rural areas of West Linn County. Demographic and economic data was largely available for west Linn County; however, most health status data is not reported at a sub-county level. When data is specific to west Linn County, it is identified as such. When data is reported for all Linn County, this is noted as well. All of Linn County includes the communities of Lebanon, Sweet Home, Brownsville, Lacomb, Scio, and Crabtree.

Timeframes for Data

This report attempts to balance the importance of comparing data from common years with the goal of presenting the most recent data. Different data sources update and release data on independent timeframes. The U.S. Census Bureau is the main source of data for demographic and socioeconomic information used in this report. The most precise data available for county-level demographic and socioeconomic data is the Census Bureau's American Community Survey (ACS) 2011-2013 three-year aggregates. This aggregation combines data from the three years in order to produce more accurate estimates. The most precise data available for sub-county estimates (the West Linn region), is a five-year aggregate from 2010-2014.

In an effort to compare data from common years, many statistics reported are from 2013, even if more recent data is available. These statistics reflect measures of health that have historically changed gradually, so differences between 2013 and the present are likely to be minor. However, some measures of health have changed greatly in the past two years, such as the implementation of the Affordable Care Act in 2014, which had huge impacts on insurance coverage rates and Medicaid membership. In this case and for other rapidly changing

measures, more contemporary data is reported in order to best reflect current health status and the current health system.

As with the ACS 2011-2013 3-year aggregates, many data sources aggregate statistics over a number of years to improve the reliability of the estimates. A common example of this is reporting the incidence (number of new cases) of cancer. For example, in the state of Oregon there were approximately 98,860 new cases of cancer in Oregon between 2008 and 2012. This statistic is reported as an incidence of 448 cases for every 100,000 people. This means that *each year*, for every 100,000 people in Oregon there were 448 cancer diagnoses. It does not mean that 448 cases per 100,000 people were diagnosed over the course of 5 years.

Chapter 2
People

The history of West Linn County begins with the Native American tribes that have lived in the region for thousands of years. Native Americans lived in the valleys and the hills, along rivers and oceans.

Contact with non-native groups began with trappers and explorers in the late 18th century, then with pioneers and settlers who moved to the Oregon Territory during the mid-1800s. Over the next 150 years, Linn County incorporated, grew in population, and developed strong local industries. Today, West Linn County is a major agricultural producer, with additional industries in manufacturing and forestry.

Health Disparities

In the discussion of residents of West Linn County, it is important to recognize that specific subpopulations may experience worse health outcomes than the general population. These include: individuals with mental health issues; homeless; rural residents; racial or ethnic groups; those with low educational attainment; persons living in poverty; and lesbian, gay, bisexual, transgender, or queer persons, among other subpopulations.

For example, across the United States, rates of illness for adults in their 30s and 40s with lower incomes and education levels are comparable to affluent adults in their 60s and 70s. College graduates can expect to live at least five years longer than those who have not finished high school, and almost two years longer than those who did not finish college.[8] People with mental health conditions and/or substance abuse issues in Oregon lose an average of 34.5 potential life years.[9] Understanding health disparities in the context of Linn County is critical to improving health across the county.

This chapter on the people of west Linn County serves as the foundation for understanding the different characteristics of the people in the county. Permanence of residency has important effects on health, but at this time there is not data detailing the mobility of residents within the county and to or from other areas. This makes it more difficult to provide an accurate picture of changing population dynamics. However, thanks in part to comprehensive data collected by the U.S. Census Bureau, we have a strong understanding of the residents of west Linn County. This chapter will detail west Linn County population, its population distribution, population centers, and population characteristics of age, gender, race, ethnicity, disability and diversity.

Population Overview

West Linn County is home to 60,924 residents.[10] Most of these residents live in Albany (pop. 50,828) with other residents in smaller towns and rural communities.

In 2013, there were 22,938 households in west Linn County. Household distribution follows roughly the same pattern as overall population distribution across the county. The average household size in West Linn County was 2.66 people. Families made up 67 percent of the households. This figure includes both married couple families and other family households.[11] Non-family households made up 23 percent of all homes in west Linn County. Most non-family households are composed of people living alone, but some are people living in households in which no one is related to the head of household.[12]

In west Linn County, 32 percent of all households have one or more people under the age of 18. Thirty percent of all Linn County households have one or more people 65 years and over.[13]

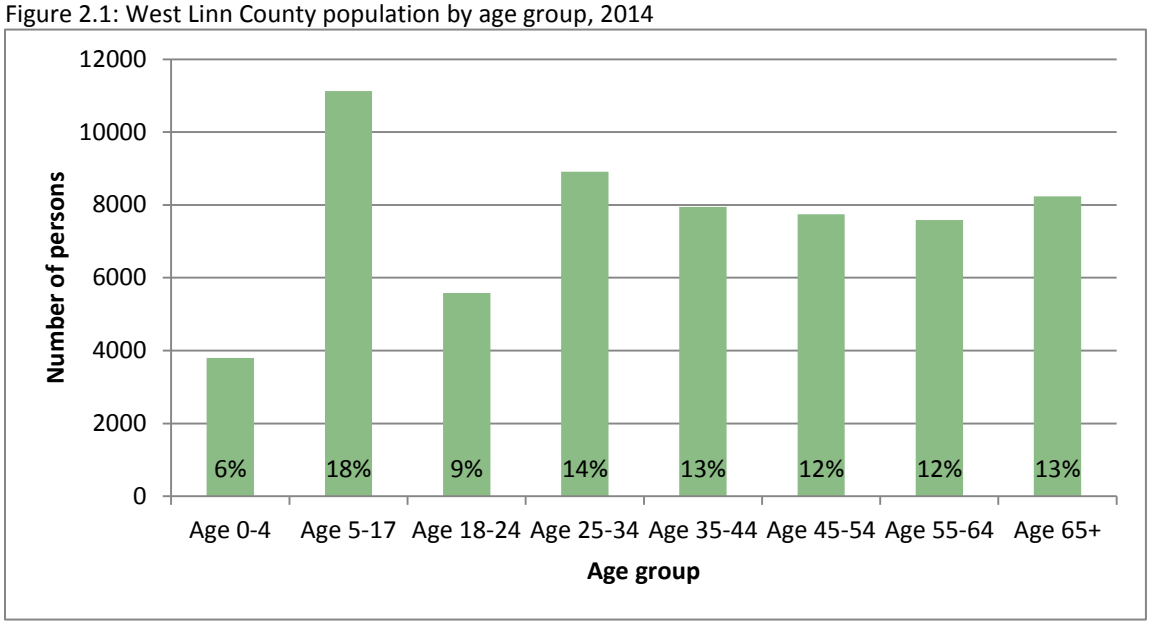
Veterans

The 2009-2013 American Community Survey (ACS) report the veteran population in West Linn County at 5,030.[14] Veterans are defined as men and women who have previously served on active duty in the U.S. Army, Navy, Air Force, Marine Corps, Coast Guard, or who served in the U.S. Merchant Marine during World War II.[15] This amounts to approximately 11 percent of West Linn County's civilian population ages 18 years and older. As this population ages, the number of individuals with veteran status is expected to decrease over time.

Demographics: Population by Age and Sex

Based on U.S. 2013 Census data, the percentage of males and females in West Linn County is approximately equal in most age groups.[16] Within west Linn County, children under 18 years of age constitute 24 percent of the population and the age group of adults 65 years and older constitutes 14 percent of the population. The median age in west Linn County is ranges from 29 to 51 years, depending on the Census tract.[17] From 2000 to 2014, the population of west Linn County grew 23 percent.[18]

Figure 2.1: West Linn County population by age group, 2014



Source: U.S. Census Bureau, American Community Survey 5-year estimates, 2010-2014

Growing Diversity

Native and Foreign Born

In 2013, 94.2 percent of the people living in west Linn County were native residents of the United States.

Race/Ethnicity

In an increasingly global view of health and understanding of research outlining the social constructs of race and ethnicity, a culturally sensitive definition of race should be considered. The inclusion of individuals to self-identify as two or more races has been adopted almost universally across other agencies collecting and reporting demographic data. It is important to understand the data for individuals along the lines of racial divide as later issues of health disparities will be presented. Without understanding the populations impacted by these health disparities, health authorities would be limited in their ability to address the specific issues creating the disparities.

U.S. Office of Management and Budget defines race and ethnicity categories accordingly:

White – people having origins in Europe, the Middle East, or North Africa.
Black or African-American – people having origins in the black racial groups in Africa.
Asian – people having origins in any of the original peoples of the Far East, Southeast Asia or the Indian subcontinent.

Native Hawaiian or Other Pacific Islander – people having origins in any of the original people of Hawaii, Guam, Samoa, or other Pacific Islands.
American Indian or Alaska Native – people having origins in any of the original peoples of North or South America (including Central America), and who maintain a tribal affiliation or community attachment.
Multiracial – people having origins in two or more of the federally designated racial categories.
Hispanic or Latino – A person of Cuban, Mexican, Puerto Rican, South or Central America, or other Spanish culture or origin, regardless of race.[19]

In this report, the non-Hispanic categories are used for races. For example, the category denoted White includes white, non-Hispanic individuals.

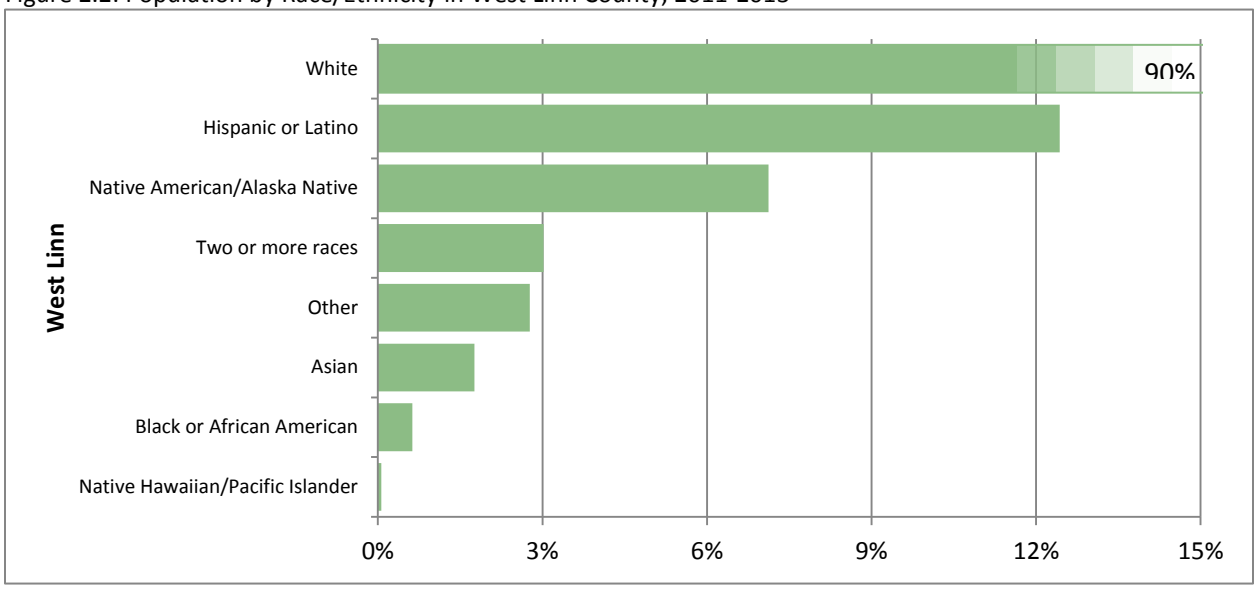
As shown in Table 2.1, the largest ethnic population in west Linn County is Latinos (12.4 percent).[20] The Latino population increased by three percent from 2000 to 2011.[21,22,23] In west Linn County, the predominant non-white racial group is multi-racial, at 3 percent. In general, west Linn County's population is less diverse than that of the state of Oregon (Figure 2.2).

Table 2.1: Population by Race/Ethnicity West Linn County 2011-2013*

Race and Ethnicity	West Linn County	
	Total Population	Percent
White	54,857	90 %
Hispanic or Latino	7,572	12.4 %
Asian	1,071	1.8 %
Two or more races	1,842	3.0 %
American Indian and Alaska Native	1,049	1.7 %
Black or African American	384	0.6 %
Hawaiian and Pacific Islander	35	0.05 %
Other race	1,686	2.8 %

Source: U.S. Census Bureau, American Community Survey 3-year estimates, 2011-2013, Table DP05
**Columns may not sum to 100% due to rounding error*

Figure 2.2: Population by Race/Ethnicity in West Linn County, 2011-2013



Source: U.S. Census Bureau, American Community Survey 5-year estimates, 2010-2014

K-12 Population

During the 2013-2014 school year, the 5 school districts of West Linn County served 9,498 students. These students include kindergarten through 12th grade. [24] These statistics do not include private schools or homeschooled students. In Table 2.2 below, the racial and ethnic diversity for the county school districts are presented.

Table 2.2: West Linn County School Districts by race/ethnicity, 2013-2014

County	White	Hispanic / Latino	Asian Pacific Islander	Multi-Ethnic	American Indian/ Alaskan Native	African American	Total Minority
Greater Albany School District	72.5%	19.8%	1.0%	5.3%	0.8%	0.6%	27.5%
Harrisburg School District	82.6%	11.2%	1.2%	4.3%	0.6%	0.1%	17.4%

Source: Oregon Department of Education, Student Ethnicity statistics, academic year 2013-2014

Language Spoken at Home

2011-2013 U.S. Census data reports that 3.5 percent of west Linn County residents who are at least 5 years old spoke English less than very well.

Disabilities

Understanding and measuring disability is a very complex task. The complexity comes from the fact that the definition of "disability" includes a number of populations, and because the definition is still being discussed and further developed. Definitions of disabilities from a source such as the World Health Organization (WHO) can help shed light on the particular health issues facing these populations, but it must be noted that this definition is not the same as that used to gather many types of data.

Disability itself is not an indicator of poor health—rather, disability can (and often does) become a barrier to employment, adequate housing, social inclusion, transportation, access to health care, and other essential components of a healthy life.

Mental illness, that substantially limits one or more major life activities, is also included in definitions of disability.[25] This is particularly worth noting, as institutionalized populations generally experience a greater prevalence and severity of mental illness than the broader population. However, these populations are not captured in much of the data collected around disability.[26]

From 2011 to 2013, among the civilian non-institutionalized population, approximately 16 percent reported a disability in west Linn County,[27] where *disability* is defined as a person's risk of participation limitation when he or she has a functional limitation or impairment.[28] Disability encompasses many different conditions; for instance, the most common disability in all of Linn County among those aged 5-64 is cognitive difficulty, with ambulatory difficulty ranking the highest for the 65 and older population. The prevalence of disability increases with age, from 1 percent of people under 5 years of age in Linn County, up to 14 percent for 18 to 64 years of age, and 41 percent of those 65 and over.

Aging Population

Among those living in west Linn County , 14 percent are 65 years of age and over, compared with 14 percent in Oregon overall.[29] A number of health issues, needs, and concerns are associated with an aging population.

Conclusion

In order to understand the health of west Linn County, it is vital to understand the people who live here. Differences in age, race or ethnicity, and geography all influence health. Vulnerable populations, such as individuals with disabilities or older adults, merit further description, both because they may require different services, and also because they may present different health concerns. The people of west Linn County are growing more diverse and represent many different groups, such as students, Native Americans, and retirees. The history of west Linn County has shaped the residents of this county into its makeup today. In exploring the

many determinants of health, it is evident that the people of west Linn County are deeply connected with the environments in which they live. The next chapter explores these environments and the effects they have on the health of west Linn County.

Chapter 3
Environment

Human beings interact with their environment in everything they do. Some of these interactions have the potential to improve health, while others can negatively impact it. The natural environment is made up of the interactions of air, water, open spaces, and weather or geologic activity. The human-made environment consists of homes, communities, and infrastructure. These two environments are closely linked in their effects on human health. Humans benefit from clean water and air, places to exercise and enjoy the outdoors, safe living and working spaces, and opportunities to engage in healthy behaviors such as active commuting and consuming healthy food. However, when an environment lacks these characteristics, the complex interactions of health and environment can worsen health issues. Poor air quality can raise the risk of asthma, heart attack, or stroke;[30] poorly designed communities can limit opportunities for recreation or access to quality food;[31] and infrequent but intense natural disasters can disproportionately affect vulnerable populations.

West Linn County has many strengths when it comes to environmental factors and health opportunities. Residents of West Linn County value open spaces for recreation, clean air, and clean water. At the same time West Linn County faces challenges with food access and transportation issues. An understanding of the natural and human-made environments forms a foundation for an analysis of the health of West Linn County. Most of the environmental data presented in this chapter is at the county geographic level.

Natural Environment

The natural environment changes slowly and usually influences health through long-term, cumulative effects. As a result, many of the data described in this section use longer time frames than elsewhere in this report. Furthermore, unlike many other determinants of health, it can be very difficult or impossible for individuals or health professionals to influence the natural environment on a local scale. Examples include global climate change or natural disasters. What can be controlled are the systems and practices put in place to react and adapt to the natural environment in order to improve health.

Terrain and Natural Resources

Linn County encompasses 2,290 square miles of land. Approximately 1,900 square miles of land are in west Linn County. Situated in the middle of Willamette Valley and ascending the western slopes of the Cascades mountain range, the climate and soils in Linn County create ideal agricultural conditions. The county produces a variety of specialty crops and is the nation's leader in ryegrass production. Linn County is also home to major producers of rare and primary metals as well as the traditional logging and wood products industries.[32] Linn County is

bordered to the west by the Willamette River, which also forms the eastern boundary of Benton County.

Annual weather patterns

Linn County experiences seasonal variation, with hot, dry summers, and cold, wet winters. On average, 44 inches of rain fall per year in the valley and 75 inches in the mountains, some of which falls as snow or ice. Most of the county's annual precipitation occurs from October to March. Temperatures frequently dip below freezing from November through April in the lower elevations, while highs above 90 degrees Fahrenheit are common in July and August. In the higher elevations of the Cascade Range, precipitation has historically fallen as snow or ice from November through April, although recent years have seen a shift toward rain.[33,34,35]

Recreation and outdoor spaces

West Linn County is favored with a great variety of recreational assets and outdoor spaces. The large geographic area, from the crest of the Cascade Range to its hub, the City of Lebanon, hosts a diverse set of environments. West Linn residents enjoy access to the full range of environments in all of Linn County.

Beginning at the Willamette River, Linn County starts its transitions from a floodplain to the foothills of the Cascade Mountains. Much of the eastern half of the county is national or state forestland. An extensive network of trails traverses these forests, which include approximately 600,000 acres of the Willamette National Forest and over 25,000 acres of the Santiam State Forest. The slopes of the Cascades are dotted with lakes and reservoirs, including Detroit Lake on the North Santiam River, Green Peter Lake on the Middle Santiam, and Foster Lake at the confluence of the Middle and South Santiam Rivers. The South Fork of the Santiam River runs through Cascadia State Park, while the Middle Fork of the Santiam River is designated a National Wild and Scenic River. The North Fork of the Santiam River, which forms the border with Marion County, is a popular rafting waterway. The Pacific Crest Trail runs along the eastern border of Linn County. Other trails provide access to rock climbing and mountaineering destinations such as Three-Fingered Jack and Mount Jefferson, the second highest point in Oregon. During the winter, Hoodoo Ski Resort, located at the eastern edge of Linn County in the Willamette National Forest, is popular with skiers and families due to its accessibility from the Willamette Valley.

Recreational Access

Access to recreational facilities and opportunities demonstrates the intersection of natural and human-made environments. Research demonstrates a strong relationship between access to recreational facilities and physical activity among adults and children. Studies have shown that proximity to places with recreational opportunities is associated with higher physical activity and lower obesity levels.[36] Public recreation areas include parks, schools, public forests and

trails, beaches, and waterfronts. As mentioned previously, Linn County's rural areas are largely accessible to residents.

Recreational opportunities that include walking and bicycling are efficient, low-cost, and available to most anyone. By walking and bicycling, residents can help develop and maintain livable communities, make neighborhoods safer and friendlier, save on motorized transportation costs, and reduce transportation-related environmental impacts, auto emissions, and noise. They can also create transportation system flexibility by providing alternative mobility options, particularly in combination with transit systems. Furthermore, creating walkable and bikeable communities can lead to healthier lifestyles.[37]

Due to the public nature of Oregon's recreational areas, 39 percent of residents in Linn County live within one half mile of a public recreation area, as defined by the CDC.[38] This is the 12th highest percentage in the state.[39,40]

Fluoridated Water

Water fluoridation is the controlled addition of a fluoride compound to a public water supply, intended to prevent tooth decay. Community water fluoridation is an evidence-based practice recommended by the Community Preventive Services Task Force based on strong evidence of effectiveness in reducing dental cavities across populations.[41] It is an effective, affordable, and safe way to protect children from tooth decay and is recognized as one of the 10 greatest public health achievements of the 20th century.[42] Water fluoridation complements, but does not replace other efforts to improve oral health. Water fluoridation is a valuable tool in addressing oral health disparities, since everyone who can access public water benefits from it regardless of age, income level, or race or ethnicity. As of 2012, Oregon was ranked very low in the United States (48th out of the 50 states) for the percentage of people receiving fluoridated water. About 75 percent of the U.S. population served by community water systems received fluoridated water, while about 23 percent of Oregon's public water supplies are fluoridated.[43] This low state fluoridation rate is a direct consequence of some of Oregon's most densely populated regions lacking fluoridation, including Portland and Eugene.

In west Linn County, two public water systems provide fluoridated water for residences, including Lebanon, and Sweet Home, covering approximately 43 percent of west Linn County residents.[44]

Human-made Environment

Human-made (or built) environments contribute to health in a variety of ways. People need schools, workplaces, and homes that do not expose them to physical or chemical hazards and places to walk and recreate outdoors that are clean, safe, and free of debris. They also need access to quality and affordable food and transportation options, as well as the confidence that their local communities have not been contaminated with human-made pollutants.[45]

Healthy Homes

Indoor environmental quality, as defined by the Centers for Disease Control and Prevention, is the quality of a building's environment in relation to the health and well-being of those who occupy the space within it. Key factors that influence a structure's indoor environmental quality include dampness and mold in buildings, building ventilation, construction and renovation, chemicals and odors, indoor temperatures, and relative humidity.[46] Buildings in West Linn County are often exposed to winter storms with winds in excess of 30 mph and heavy rainfall, with 24 hour accumulations of greater than three inches. This combination often results in moisture entering buildings, creating conditions for the growth of mold. Examining the health effects of specific contaminants in buildings is very complex, but research has shown that some respiratory symptoms and illnesses can be associated with damp buildings.[47] According to County Health Rankings, 17 percent of households in Linn County have severe housing problems.

Tobacco-free Spaces

Tobacco use is still the leading preventable cause of death and disability in Linn County. Statistics on tobacco related diseases and deaths are discussed in Chapter 6: Morbidity and Mortality.
Tobacco use is directly linked to coronary heart disease, stroke, cancer and chronic lung disease. Tobacco use is also linked to additional health and environmental concerns such as exposure to second hand smoke; fire related death and injury; increased risks of wildfires; and littering of toxic cigarette filters. In order to reduce these health and environmental impacts, Linn County and the state have taken steps to reduce exposure to tobacco and cigarette smoke in public places.

Currently, Oregon law prohibits smoking and other tobacco products in most workplaces, schools, bars, and other indoor public spaces. Lebanon has banned smoking at city parks. Many governmental bodies are expanding smoke- or tobacco-free policies to explicitly include e-cigarettes.[48,49,50]

In Linn County, a number of non-governmental entities also restrict or ban tobacco on their properties. Linn Benton Community College is 100 percent tobacco free. Samaritan Albany General Hospital, Samaritan Health Services, the Corvallis Clinic, and other health providers ban tobacco products, as does Willamette Neighborhood Housing Services and other low-income housing services. Linn-Benton Housing Authority is smoke free at most of its units, with restrictions in place on the few that permit smoking.[51,52,53]

Transportation

Transportation links people and places, making it possible to get to work, to school, to recreational opportunities, and to the grocery store. Transportation includes more than roads, walkways, or bridges. It also encompasses public transit systems, policies that dictate the

location and construction of roads, and guidelines for accommodating different kinds of users. Guidelines are important for providing avenues for physical activity, and for reducing the potential of driver, cyclist, and pedestrian injury.

Access to Public Transportation

Access to public transportation is an important public good. Not only does taking public transportation provide additional opportunities for exercise, but the presence of public transportation also makes it easier for individuals and families without private transportation to access goods and services vital to maintaining health. These include grocery stores, health and dental care, and recreation facilities. In Oregon, counties with large metropolitan areas relative to county population size tend to have more public transportation options. Linn County's large land area and the greater distances between its small cities and towns pose challenges for county and city public transit. Seventeen percent of Linn County residents live within one quarter of a mile of a bus stop.[54] Although distance to a public transportation route is one measure of the strength of a public transportation system, additional factors impact the strength of public transport, including frequency and hours of operation, direct routes, and connections to other routes.

People of color, people experiencing poverty, people with disabilities, and people who experience language barriers are more likely to depend on public transit. However, they often live in areas with poor transit service, fewer destinations, and poor connectivity. These unfair burdens increase transportation costs and stress, and limit access to economic and educational opportunities, housing, healthy foods, and physical activity. Vulnerable populations often have unsafe transportation conditions, including limited safe crossings, areas with high-speed traffic, and poor sidewalk and bicycle infrastructure.

Access to Healthy Foods

Transportation options and limited public transportation for Linn County residents contributes to challenges with regard to nutritious food access. For households without private vehicles, the ability to shop for food at grocery stores is highly dependent on proximity. Thirteen percent of households in Linn County are within one half mile of a grocery store. The average distance between a household and the nearest grocery store is 2.3 miles.[55] However, since grocery stores tend to be located in larger towns, the county average may overestimate the urban average and underestimate the rural average.

Access to nutritious foods can be particularly difficult for residents with unreliable transportation or tight budgets. A rural community is considered to have low access to food when it is ten or more miles from a supermarket or large grocery store. Rural residents must often travel long distances for food. For rural residents in Linn County this could mean traveling as much as 20 miles to the nearest full service grocery store. Rural grocery stores throughout the county report barriers that may limit rural low-income families' access to healthy food.

These include: administrative barriers to becoming an authorized vender for SNAP and WIC programs, economic barriers to offering fresh fruits and vegetables, meat, dairy and other refrigerated foods.[56]

As a comparison, more than twice as many Linn County residents live within one half mile of a tobacco vendor than live within one half mile of a grocery store; more than 3 times as many residents live within one half mile of a tobacco vender compared to those who live within one half mile of a WIC authorized store (Table 3.1). Approximately nine percent of Linn County residents are low income and do not live close to a grocery store.[1,57]

Table 3.1: Proximity to grocery stores compared to tobacco vendors in Linn County, 2012

Vendor	Average (mean) walking distance in miles	Percent of population living within ½ mile
Grocery stores	2.3	13 %
WIC-authorized stores	2.8	9 %
Tobacco vendors	1.4	38 %

Source: Oregon Environmental Public Health Tracking, 2012

In addition to access to nutritious food, proximity to fast food can affect the health of the community. Although complex in nature, the food environment can impact what people eat, and providing healthy options is vital for the health of the community. Although not causal, studies have shown an increase in the prevalence of obesity and diabetes with increased access to fast food outlets in a community. Thirty-eight percent of restaurants in Linn County are fast food vendors.[58]

Conclusion

The previous Community Health Needs Assessment did not include a section on the environment, and changes to the environment generally take place over long time frames. Therefore there are no comparisons that can be made with the previous CHNA.

[1] "Close" is defined as within 1 mile for urban areas and within 10 miles for rural areas

Chapter 4
Social Determinants of Health

Opportunities for health among residents of West Linn County begins within their communities including their homes, neighborhoods, places of worship, workplaces, and schools. A growing body of scientific research shows that all people benefit when communities invest in health.

The World Health Organization defines social determinants of health as "the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life".[59] These non-medical factors contribute to a large percent of preventable poor health outcomes. Social determinants include influences such as: "early years' experiences, education, economic status, employment and decent work, housing and environment, and effective systems of preventing and treating ill health."[60] These aspects of health are often referred to as "upstream factors" since their effect occurs well before illness manifests and curative intervention becomes necessary. In this chapter West Linn County data will be presented for education, employment, income, poverty, economic challenges, food security, home ownership, and homelessness. Where West Linn County data is not available, Linn County data is reported.

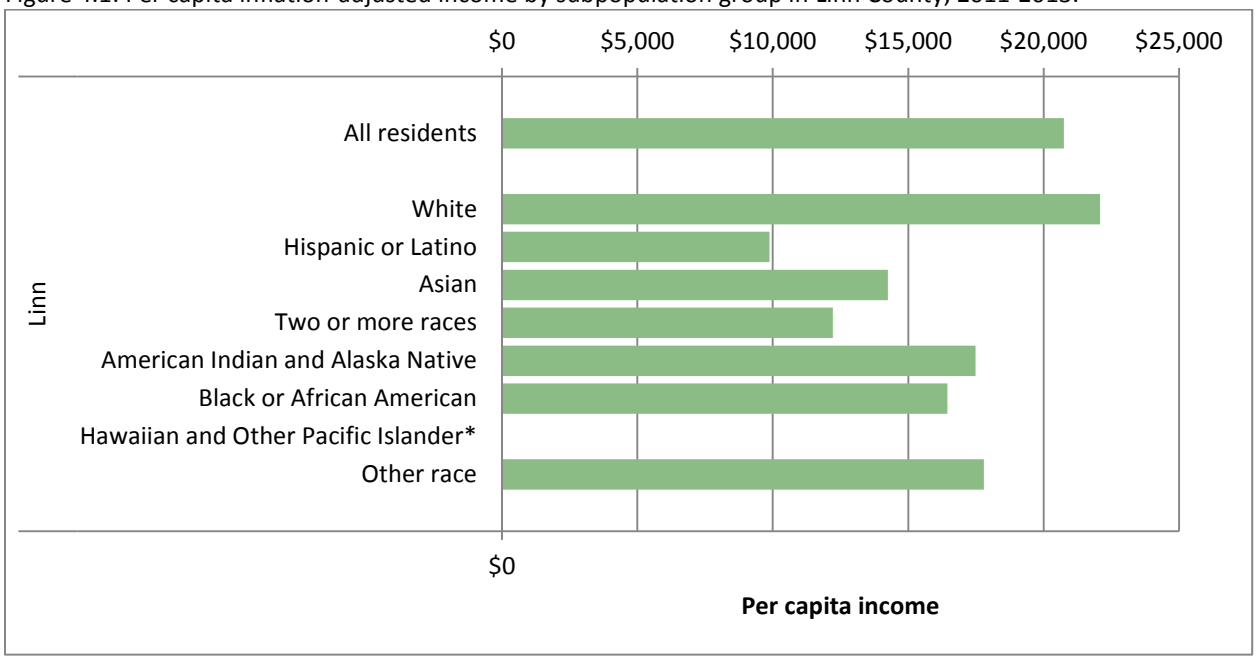
Income, Poverty, and Economic Challenges

Income is the strongest predictor of health among all social determinants of health. Not only are there many studies showing a strong association between income and health[61], but income also affects all other social determinants of health, including education, food security, and housing. The National Longitudinal Mortality Survey found that people in the top five percent of incomes had life expectancies 25 percent longer than people in the bottom five percent of incomes.[62] While income is not a "one size fits all" measure of health, understanding the income characteristics of West Linn County provides a solid foundation for measuring social determinants of health in West Linn County.

Median Incomes

The median income of a population is a measure of the average income in that population; 50% of the population earns more than the median income, and 50% of the population earns less. The median (inflation-adjusted) household income for West Linn County ranges between $22,000 and $68,000 depending on the Census Tract; the median household income for all of Linn County is $44,722.

Figure 4.1: Per capita inflation-adjusted income by subpopulation group in Linn County, 2011-2013.



Source: U.S. Census Bureau American Community Survey, 2010-2014
** Hawaiian and Other Pacific Islander data suppressed*

Income inequality

Income inequality (the distribution of wealth between richer and poor segments of the population) is associated with many health outcomes. Regions with higher inequality are more likely to experience increased infant mortality, lower life expectancy, higher rates of depression, and lower health status overall. Income inequality is commonly measured by calculating the ratio of the 80th income percentile to the 20th income percentile of the population.[263] In Oregon, the 80th income percentile is 4.6 times the 20th income percentile. West Linn County has a ratio of 4.2, significantly lower than the state ratio.

Poverty

Poverty is inextricably linked to poor health outcomes. Poverty is related to both limited income and lack of economic stability, limited choices in education, employment, and living conditions, and reduced access to safe places to live, work, and play. It can also frequently hinder choices and access to healthy food.

The United States Census Bureau determines the Federal Poverty Level (FPL) each year. The FPL was originally an estimate of the amount of money required to meet the cost of living for

[2] The 80th income percentile is the income of the individual who earns more than 80 percent of the population. The 20th income percentile is the income of the individual who earns more than 20 percent of the population. Those who earn more than the 80th income percentile are the richest 20% of the population; those who earn less than the 20th percentile are the poorest 20% of the population.

individuals or families. Currently, the FPL is a statistical threshold of poverty.[64] It is not generally recognized as an accurate measure of true poverty, but it is used for determining eligibility for assistance programs. Below, in Table 4.1, the FPL for individuals and families is presented, as well as specific FPL ratios that are used for eligibility and comparison purposes.

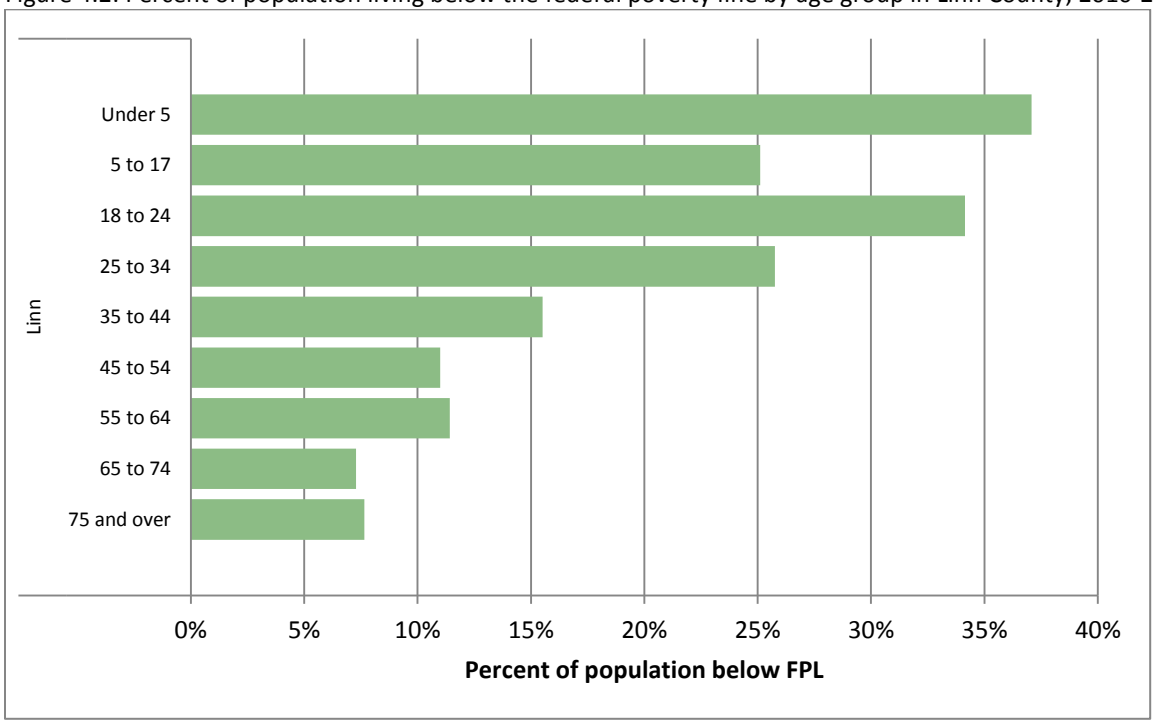
Table 4.1: Annual Income and Federal Poverty Levels and related ratios for 2013.

Family size	Percent of Federal Poverty Level					
	50%	**100%**	138%	185%	200%	400%
Individual	$5,940	**$11,880**	$16,394	$21,978	$23,760	$47,520
Three person family	$9,277	**$18,554**	$25,605	$34,325	$37,108	$74,216
Four person family	$11,922	**$23,844**	$32,905	$44,111	$47,688	$95,376

Source: U.S. Census Bureau, Historical Poverty Threshold Table

Approximately 22 percent of West Linn County's population lives below the federal poverty line, compared to 17 percent of Oregon's total population. One worrisome statistic is that children less than 18 years of age are among the age groups with the highest percentage living below the federal poverty level in Linn County.[65] 26 percent of children less than 18 years of age are below the poverty level.

Figure 4.2: Percent of population living below the federal poverty line by age group in Linn County, 2010-2014

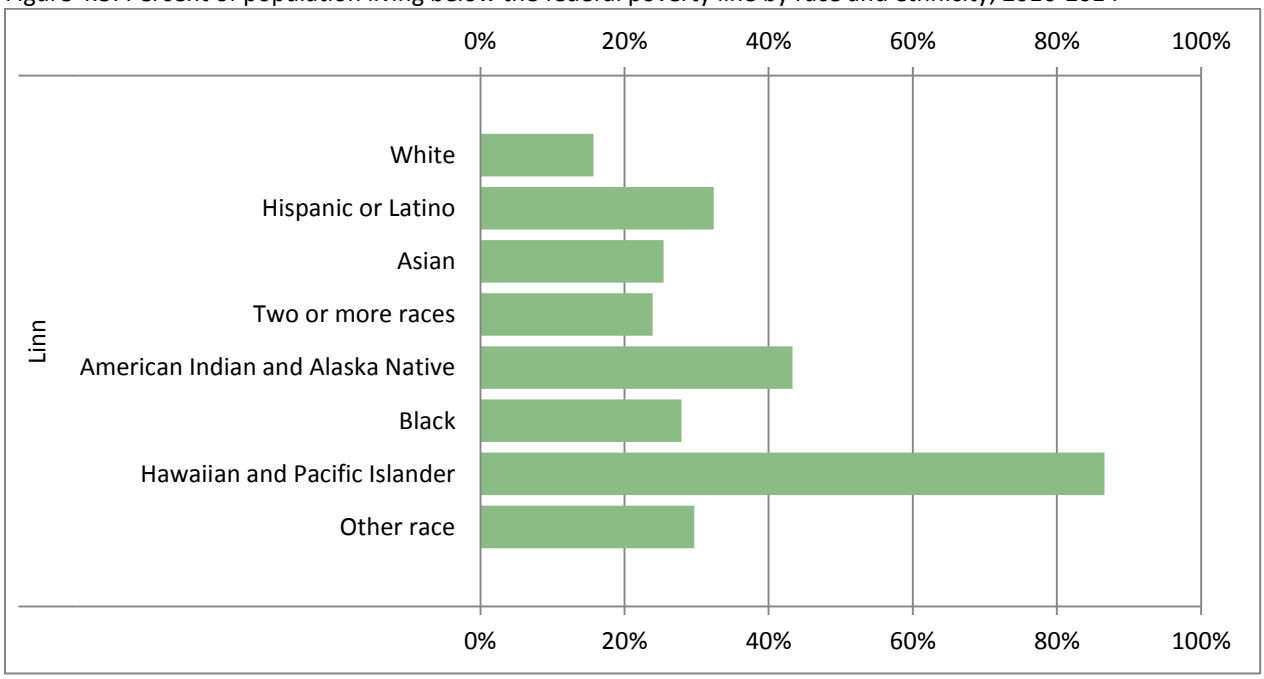


Source: U.S. Census Bureau, American Community Survey, 2010-2014

Earning less than a high school education increases the risk of experiencing poverty.[66] In Linn County, 24 percent of adults over the age of 25 who did not complete high school are below the federal poverty line, compared with 15 percent of those who completed high school.

Variation in poverty rates also exists between racial/ethnic groups in Linn County. As shown in Figure 4.3, all racial and ethnic groups in Linn County have a higher poverty rate than the White, non-Hispanic/Latino population. Individuals in Linn County who identify as Hawaiian or Pacific Islander and Black or African American are among the race/ethnic groups with the highest poverty rates with 87 percent and 28 percent, respectively.[67] It is important to note, however, that the population for these racial/ethnic groups, in addition to the American Indian and Asian populations, is small relative to other groups within the county.

Figure 4.3: Percent of population living below the federal poverty line by race and ethnicity, 2010-2014



Source: U.S. Census Bureau, American Community Population, 2010-2014

Low Income and Cost of Living

Many Linn County residents earn incomes higher than the federal poverty level but still struggle economically to meet their everyday needs. Nearly 37 percent of Linn County earns less than 185 percent of the federal poverty level ($21,775 annually for an individual or $44,863 annually for a family of four in 2015).[68,69] This is the threshold that many assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), use for income eligibility.

Research suggests that the cost of living in Linn County is well above the federal poverty level. Table 4.2 below shows the cost of living for three family types in each county, and the corresponding poverty level. These figures take into account costs such as housing, child care, food, transportation health care, and taxes.

Table 4.2: Cost of living as a percent of the federal poverty level, 2014

County	One adult, one preschooler		One adult, one preschooler, one school-age		Two adults, one preschooler, one school-age	
	Annual cost of living	Annual cost of living as percentage of FPL	Annual cost of living	Annual cost of living as percentage of FPL	Annual cost of living	Annual cost of living as percentage of FPL
Linn	$29,415	187%	$33,809	171%	$41,866	176%

Source: The Self-Sufficiency Standard for Oregon, 2014

Employment

Stable and secure employment influences health, not only by being a source of income, but also by providing access to health insurance. Compared to unemployed workers, individuals who are employed fulltime have higher incomes and standards of living, less stress, and may be less likely to turn to unhealthy coping behaviors such as alcohol consumption or smoking.[70] The unemployment rate has been decreasing steadily in recent years.[71] As of April 2015, the seasonally adjusted unemployment rate in Linn County was 6.3 percent.[72] Generally, an unemployment rate of 5% is considered "full employment" as there is always a certain amount of turnover in the labor force.

Economic Opportunities

Twenty-seven percent of Linn County residents that are employed work in education, health care, and social assistance. Other important business sectors are retail trade; manufacturing; and professional, scientific, management, administrative, and waste services.[73]

Education

Health and education are closely connected. Educational access and attainment are very important predictors of health status. Individuals with higher levels of education are less likely to die prematurely or report acute diseases. They also report positive health behaviors, like maintaining healthy weight, and fewer risky behaviors, like smoking.[74] Furthermore, education levels are the strongest predictor of income and wealth, which strongly influence lifelong health.[75]

Early Learning

Early childhood development supports nurturing relationships and learning opportunities that foster children's readiness for school. The early years are crucial for influencing health and social well-being across a child's lifetime. Research evidence accumulated over the past 40 years

supports the conclusion that children who participate in high-quality early childhood development (ECD) programs benefit from a broad range of immediate and long-term health benefits.[76]

The Head Start Program is one such federal program that promotes the school readiness of children from low-income families by enhancing their cognitive, social, and emotional development. Head Start programs provide a learning environment that supports children's growth from birth to age five in several areas, such as language, literacy, and social and emotional development. Head Start programs also emphasize the role of parents as their child's first and most influential teacher, and support the development of healthy familial relationships and well-being.[77] In Oregon, Head Start programs include the Oregon Head Start Prekindergarten (OHS PreK) program, which serves children age three to five from low-income families. Some Head Start programs also include Early Head Start (EHS), which is a comprehensive program for children below the age of three and pregnant women from low-income families. Oregon children whose families are below the federal poverty level ($24,250 for a family of 4) are eligible for these benefit programs.[78-]

The OHS PreK and EHS programs that serve children and families in Linn County are shown in Table 4.3 below:

Table 4.3: Oregon Head Start PreK and Early Head Start programs and enrollment, 2013-2014

OHS PreK and EHS program	County	OHS PreK enrollment	EHS enrollment	Total enrollment
Kids and Company of Linn and Benton Counties (KidCo) Head Start	Linn and Benton	449	52	501
Total		449	52	501

Source: Oregon Department of Education, Early Learning Division, Oregon Head Start Prekindergarten Programs 2013-2014 Directory

Despite strong research showing the positive impact of high-quality early education, many families in Linn County who are in need of child care may not be served. While there are not data for informal child care options, in 2012, for every 100 children there were 13 available child care slots in Linn County. In Oregon, there were 17 available child care slots per 100 children. The goal for the state is 25 slots per 100 children; Linn County has not yet met that goal. In addition to availability, price may be a barrier for many families. The average annual cost of toddler care in childcare centers in Linn County is $7,680, is lower than the average cost in Oregon.[79,80,81]

High School Education

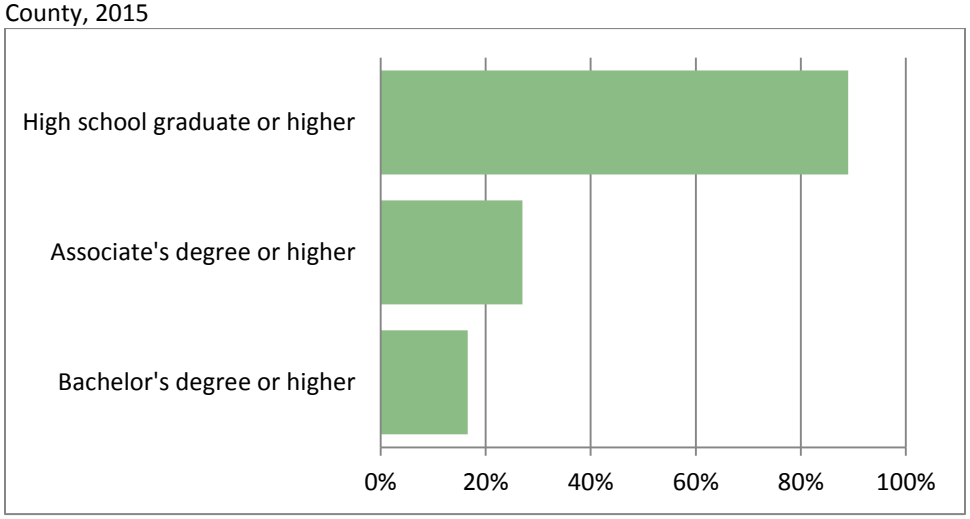
High school graduation is a strong predictor of future employment and earnings. Conversely, dropping out of school is associated with lower income, multiple social and health problems,[82] and health risks.[83] For example, 32 percent of Oregonians who do not have a high school

degree smoke, compared with 24 percent of high school graduates, 18 percent with some post-secondary education, and seven percent of college graduates (age-adjusted).[84]

In the 2013-2014 school year, Linn County experienced a high school dropout rate of 38 students per 1,000 9th–12th graders. In general, Linn County's dropout rates were comparable with the state dropout rate between 2008 and 2014. West Linn County had a high school graduation rate of 81%.

In 2011, Oregon set a goal of 40-40-20, meaning that by 2025, 40 percent of Oregonians would have a bachelor's degree or higher, an additional 40 percent would have an associate's degree, and the remaining 20 percent would have graduated high school. This translates to 100% of Oregonians having a high school degree or higher, and 80% having an associate's degree or higher. In 2013, 90% of West Linn County residents had completed high school or GED equivalent, 27% had an associate's degree or some college, and 17% had a bachelor's degree or higher (Figure 4.4). .[85]

Figure 4.4: Rates of high school completion, associate's degree or higher, and bachelor's degree or higher in Linn County, 2015



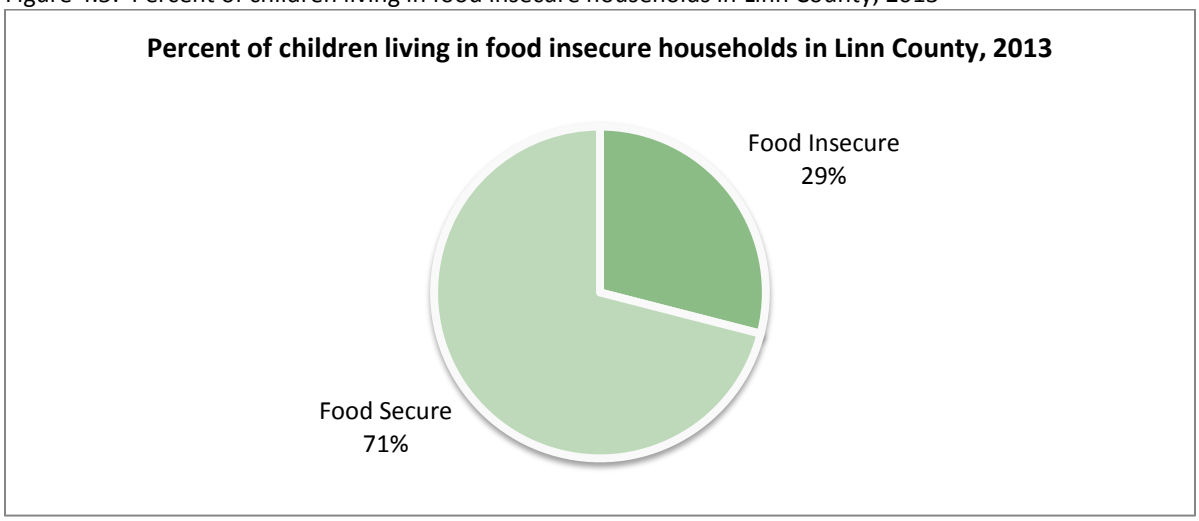
Source: County Health Rankings 2015

Food Security

Food security is defined as having enough to eat, and being able to purchase or obtain healthy food in socially acceptable ways.[86] Adequate nutrition is particularly important for children, as it affects their cognitive and behavioral development. Children from food insecure, low-income households are more likely to experience irritability, fatigue, and difficulty concentrating on tasks, especially in school, compared to other children.[87]

Feeding America, a national nonprofit that monitors food security, estimates that 29 percent of children in Linn County are living in food insecure households as shown in Figure 4.5 below.

Figure 4.5: Percent of children living in food insecure households in Linn County, 2013



Source: Feeding America

Based on Oregon Department of Education data, 51 percent of West Linn County K-12 students were eligible for free/reduced lunch during the 2013-2014 school year. Students whose family incomes are below 130 percent of the federal poverty level ($31,525 annually for a family of four) are eligible for free lunches, and students whose family incomes lie between 130 and 185 percent of the federal poverty level (between $31,525 and $44,863 annually for a family of four) are eligible for reduced-price lunches.[88,89]

An analysis of factors[3] determining food insecurity suggests that in 2013, 16 percent of Linn County population, nearly 20,000 individuals, were residing in households that were food insecure. Among those who were food insecure, 21 percent earned incomes above 185 percent of the federal poverty level, making them ineligible to participate in government assistance programs (Table 4.4). The childhood food insecurity rate was about the same, at 16 percent of the children in Linn County. Of the children living in food insecure households in Linn County, it is estimated that 21 percent of these children are likely ineligible for federal nutrition programs because they live in households with incomes above 185 percent of the federal poverty level.[90]

Table 4.4: Food insecurity in Linn County, 2013

	Number of food insecure individuals	Percent of population that is food insecure	Percent of food insecure people who are ineligible for benefits *
Linn County	19,020	16%	21%
Oregon		16%	25%

* Percent ineligible figure is produced by modeling and is an estimate
Source: Feeding America

[3] Factors include indicators of food insecurity such as poverty, unemployment, median income; food budget shortfalls; a cost of food index; and national average meal costs.

Supplemental Nutrition Assistance Program Participation

The Federal Supplemental Nutrition Assistance Program (SNAP) is the largest domestic food and nutrition assistance program for low-income Americans. U.S. households must meet certain eligibility criteria, such as income, to receive benefits. In 2013, it is estimated that 23 percent of all households (5,177 households) in West Linn County received SNAP benefits.

Women, Infants and Children (WIC)

WIC is a public health nutrition program that is vital to the health of women, infants, and children across Oregon. The WIC program provides health and nutrition services to pregnant and breastfeeding women and children ages 0 to 5 that have a household income less than 185 percent of poverty guidelines.[91] Overall in 2013, a total of 2,489 families were served by WIC in Linn County; 72 percent of these were infants and children under five, and 28 percent were pregnant, breastfeeding, and post-partum women. Approximately 49% of pregnant women in Linn County were served by WIC. Furthermore, 63 percent of families served by WIC in Linn County were working families. [92,93,94]

Emergency Food Support

Linn Benton Food Share, the regional food bank system, distributes emergency food boxes to 23 food pantries (emergency food box agencies) located in both Linn and Benton Counties. In addition to the pantries, Linn Benton Food Share also provides assistance through programs, such as emergency meal sites (soup kitchens), supplemental programs, and gleaners and wood share.[95]

Below are the most salient demographic characteristics of the population that is served by the Linn Benton Food Share:

- 36% of those receiving emergency food are children.
- 7% of those receiving emergency food are 65 years and older.
- 55% of households have children.
- 46% of households had at least one member working.
- 30% of households have one or more member working a full-time job.
- 58% of households report delaying medical care.
- 68% of households report delaying dental care.
- 47% of households delay filling medical prescriptions due to cost.
- 56% report medical/hospital debts.[96]

Linn Benton Food Share distributed over 52,000 food boxes from July 2013 through July 2014. One food box typically contains enough groceries for a 4 day supply[97]. In addition, the Food Share served over 272,000 meals in soup kitchens and shelters. Between food boxes and emergency meals, Linn Benton Food Share provided enough meals to feed nearly 2,500 people three meals a day for the whole year. [98]

Housing and Home Ownership

Housing is an important part of the built environment and another key factor contributing to good health. Older housing in particular can present multiple threats to health, including the presence of mold, asbestos, lead-based paint, and lead solder in plumbing and in the soil.

Poor quality and inadequate housing contribute to health problems such as infectious and chronic diseases, injuries, and poor childhood development. Indoor allergens and damp housing conditions play an important role in respiratory conditions including asthma, which currently affects over 20 million Americans and is the most common chronic disease among children. Approximately 40 percent of diagnosed asthma among children is believed to be attributable to residential exposures.

Housing Affordability

Affordable, quality housing provides shelter that is safe and healthy for all people. Housing that costs more than 30 percent of household income is considered to be "unaffordable."[99] Thirty-eight percent of West Linn households are cost burdened.

Homelessness

The Oregon's Ending Homelessness Advisory Council defines homelessness as being without a decent, safe, stable, and permanent place to live that is fit for human habitation.[100] Understanding homeless populations is a daunting challenge for public health. Homeless people are just as much a part of society as housed individuals, but they face additional obstacles in accessing social services or health care. Even counting the number of homeless individuals is a difficult task, because a homeless individual may move around a lot during the year or be unwilling to interact with social services. Each January, Oregon Housing and Community Services require communities to conduct a point-in-time count of homeless populations. This snapshot of the homeless population is limited in scope and depth. Canvassers visit shelters, transitional housing, and known homeless encampments. Individuals staying with other people out of economic necessity are not counted, nor are homeless people who are in areas not covered by the canvassing. Furthermore, the one-night count misses any individual who is homeless at other points during the year. Notwithstanding these limitations, the point-in-time estimates have the benefit of being a consistent approach across years and geographies, and therefore may give some insight into the homeless community in Linn County.

In 2011, the county point-in-time surveys counted 135 homeless individuals in Linn County (Table 4.5). All of these individuals were in shelters or transitional housing. There were no street counts conducted in Linn County in 2011. Fifty percent of the homeless population in Linn County was male. The average length of time spent homeless was 22 months for men and 13 months for women.

The most recent data on homeless populations is from 2015 (Table 4.7). In 2015, there were 246 homeless individuals identified in the January point-in-time survey, an increase of 44 percent in four years. However, in 2015 the unsheltered counts comprised the majority of the records, which may indicate a larger canvassing effort rather than solely an increase in the homeless population.

In both 2011 and 2015, approximately one quarter of the recorded individuals were members of families, both adults and children (Table 4.5).

Table 4.5: One-night count homeless population figures in Linn County

	2011	2015
Total homeless count	135	246
Sheltered count	125	197
Unsheltered count	10	49
Male	84	123
Female	51	108
Individuals	109	186
Family members	26	60
Average months spent homeless (male / female)	22 / 13	No data

* Counts do not sum to total
Source: OHCS and Community Services Consortium

Another source for recording the number of homeless individuals is the set of statistics gathered by federally qualified health centers (FQHCs). Among the data that FQHCs are required to collect is housing status, which they report each year to the federal government. According to the Bureau of Primary Health Care, a patient's status should be recorded as homeless if the patient was residing in a shelter, transitional housing, on the street, if the patient was doubled up or temporarily living with others, had been homeless within the last 12 months, or resided in a housing program targeted to homeless populations. Compared with the one-night counts, FQHCs may identify homeless individuals who were not staying in shelters or in canvassed encampments or who were homeless at other times throughout the year. However, only those individuals who were able to seek out medical care at an FQHC and chose to do so were identified. Nevertheless, the records provided by the FQHCs indicate a much broader level of homelessness than the one-night counts. In 2014, the Benton Linn FQHC served approximately 835 homeless patients who were homeless during at least one visit to the FQHC. This number is over three times as large as the 2015 one-night count, and represents a 50 percent increase from the number of homeless FQHC patients in 2012.[101]

While these two data sources can broaden the understanding of the homeless population in Linn County, a major challenge is reconciling their different purposes and methodologies. If a crosswalk of data could be created, it would potentially greatly clarify the picture of homelessness in Linn County.

Student homelessness is a recurring problem in Oregon as well. Across the state, an increasing number of Oregon's K-12 public school students are homeless at some point during the school year. Homelessness among students has more than doubled since the 2003-2004 academic school year. 4.1 percent of West Linn County K-12 students experienced homelessness in the 2014-2015 academic year. Table 4.6 shows the number of homeless students in each school district in West Linn County in the 2014-2015 academic year.

Table 4.6: Homeless K-12 students in West Linn County, 2014-2015

	Number	Percent
Greater Albany SD	385	4.1 %
Harrisburg SD	32	3.7 %
West Linn County	417	4.1 %

Source: Oregon Department of Education

Conclusion

The major change in the socioeconomic status of Linn County is the unemployment rate, decreased from 10.3 percent in 2011 to 6.3 percent in 2015. Other comparable indicators have stayed largely the same.

Chapter 5
Access to Medical Care

It is important to examine medical care access and capacity in the larger context of overall factors that contribute to health. "Health care is necessary but not sufficient for improved health; in fact, health care accounts for only about 10–20 percent of health outcomes, according to some experts."[102] Social determinants of health, the upstream factors listed in the previous chapter, are responsible for a much larger percentage of health outcomes than medical care alone. People need a healthy and accessible environment to achieve good health. This includes the broader community context, as well as the characteristics of the local health care system itself.

Many of the forces that shape the opportunity for better health in West Linn County – education, employment, and transportation, for instance – can also affect access to medical care. Hospital data is reported for Samaritan Albany General Hospital; other data is reported at the county level.

Demographic Differences in Access to Medical Care

Some populations face increased barriers to accessing care and receive poorer quality care when they get it. In its 2011 reports on health care quality and disparities, the Agency for Healthcare Research and Quality (AHRQ) finds that, at a national level, low income individuals and people of color experience more barriers to care and receive poorer quality care. Moreover, other research shows that individuals with limited English proficiency are less likely than those who are English proficient to seek care even when insured. Research also finds differing patient experiences and levels of satisfaction by race, gender, education levels, and language.[103]

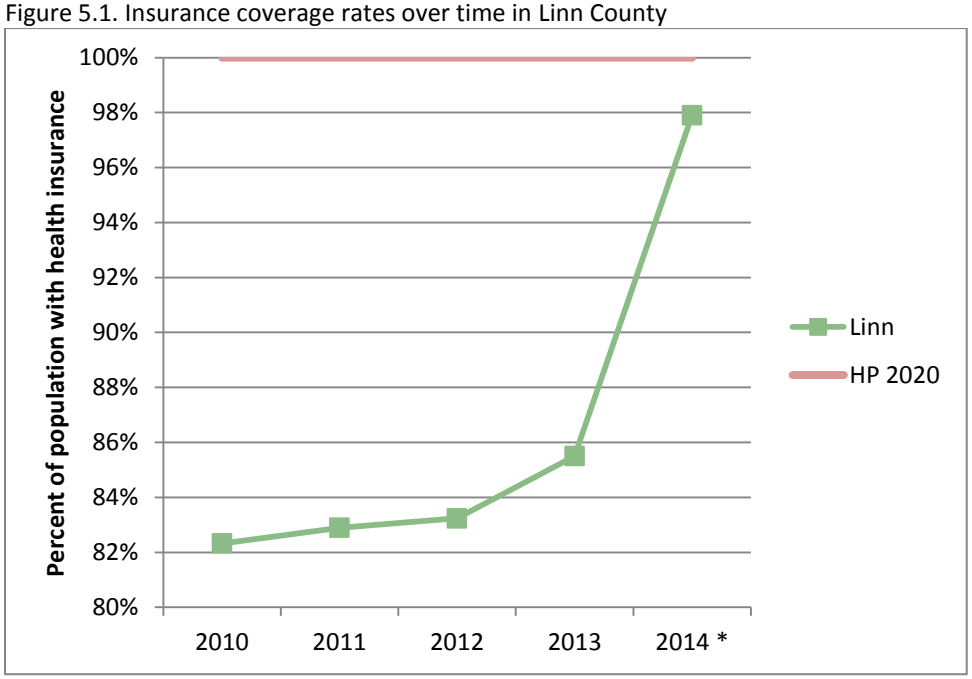
Health Insurance Coverage

Lack of adequate health insurance coverage is often a major barrier to medical care. People who are uninsured or underinsured receive less medical care than their insured counterparts.[104] Inadequate coverage creates a financial barrier between a patient and needed medical care. People without health insurance are less likely to know about or seek out preventive services, and are more likely to have new and worsening health problems, and shorter lifespans.[105] In general, even when uninsured/underinsured persons receive medical care, care is often postponed (due, in part, to concerns about cost). As part of the ACA, Oregon accepted federal funding to expand Oregon Health Plan (OHP) membership, setting targets for enrollment and expanding the variety of services (e.g. dental services). Statewide, membership in OHP increased 75 percent over four years, from 469,000 members in January 2010 to 821,000

members in January 2014. Linn County enrollment increased from 18,000 members to 31,000 members over the same time period.[106,107] In addition to OHP expansion, eighty percent of the consumers registered to the new health care exchange received tax credits and/or cost-sharing subsidies as of April 2014.[108]

Insurance coverage rates in Linn County have risen recently, largely due to the ACA and other healthcare transformation policies. Linn County insurance coverage rate in 2012 was 82 percent, rising to 98 percent in 2014.[109] (Figure 5.1).[110]

Figure 5.1. Insurance coverage rates over time in Linn County



Source: U.S. Census Bureau, American Community Survey, 2009-2013
** 2014 coverage rates are from Oregon Health Authority, 2015*

Because of the rapidly shifting health care and health insurance landscape, local data points that accurately capture these changes are still forthcoming. With that in mind, data from before the ACA expansion showed major disparities among the population based on age, race, and income. Examining these disparities across Linn County can help provide a baseline for future comparisons with disparities which exist after ACA expansion once the data is available.

Uninsured rates

Uninsured rates differed greatly between age groups before ACA. The uninsured rate among children across Linn County was lower than the rate for working-age adults (Table 5.1).[111] Across Linn County, less than one percent of individuals 65 and older lack health insurance due to Medicare. The age group with the highest uninsured rates in Linn County was 18 to 24 year olds, at 22 percent.

Table 5.1: Uninsured rates in Linn County, 2011-2013

	Linn County
Under 18 years old	8.6 %
18 to 64 years old	22.1 %
65 years old and older	0.7 %

Source: U.S. Census Bureau, ACS 2011-2013, Table S2702

Insurance coverage rates were also pronounced across racial/ethnicity categories, employment status, and citizenship status. From 2009 to 2013 in Linn County, over 28 percent of Latino individuals and over 30 percent of American Indian and Alaska Native were uninsured, compared to 16 percent of Asians and 15 percent of the White population. Black or African American, two or more races, and other races had uninsured rates between 27 and 15 percent. Additionally, 42 percent of the unemployed are uninsured, compared to 17 percent of those currently employed. The foreign born and non-citizens have very high uninsured rates, at 45 percent and 59 percent, respectively.[112] Insurance coverage data is not available for undocumented immigrants. However, undocumented immigrants, including undocumented children, are excluded from both Medicaid and the health insurance exchange.[113]
Among the employed, those working less than full time year-round were uninsured at a higher rate (25 percent) compared to those working full time year-round (13 percent). Residents earning less than 200 percent of the federal poverty level are more likely to be without insurance coverage than those with higher incomes, 24 percent versus 9 percent.[114]
The implementation of the Affordable Care Act has had a major impact on insurance coverage rates in Linn County, as Figure 5.1 demonstrates. However, even given the growth in insurance coverage rates over the past 5 years, insurance gaps and inequalities remain, especially for people of color, individuals living in rural areas, and low income workers.[115] As data for recent years become available, it will be important to measure these disparities.

Health insurance among children

Examining insurance coverage rates among children up to age 18 shows a gradual increase in Linn County from 2006 to 2012. As of 2012, Linn County had an insurance coverage rate of 90 to 95 percent for children under the age of 18. While data are not yet available to demonstrate the effects of the ACA on insurance coverage rates among children, the upward trend preceding the ACA expansion provides an important baseline.

Cost of Medical Care

Insurance coverage is only part of the cost of medical care. Additional costs are referred to as cost-sharing and include costs such as copayments, coinsurance and deductibles. Health reform legislation has reduced financial burdens for many people with lower income or significant health care needs. Nevertheless, one in three Americans say they have put off getting medical treatment that they or their family members need because of cost.[116]

According to the County Health Rankings, during the 2006-2012 period, 17 percent of adults in Linn County reported they did not see a doctor in the past 12 months because of cost.[117]

Access Capacity

Primary care, mental health, and oral health are foundational to a comprehensive offering of medical care for a population. Other primary care providers are especially vital in rural areas that may not have the population density to support a full time physician.

Linn County had 1,557 residents per primary care physician; 1,151 residents per primary care provider; 907 residents per behavioral health provider, and 1,854 residents per oral health provider.

Having a usual primary care provider (PCP) is associated with improved health outcomes, increased health equity, and lower healthcare costs. Effective PCPs work to maintain sustainable relationships with patients, connect them with additional health resources in the community, and coordinate their care. Patients with ongoing access to PCPs and other healthcare services have better relationships with their providers and are more likely to receive appropriate care than patients without a regular healthcare provider.[118]

Safety Net Services & Community Benefits

The health care "safety net" refers to the component of the health care system serving low-income and uninsured people. Safety net services are complemented by community funding, programs and activities.[119]

Samaritan Albany General Hospital InReach Clinic serves West Linn County and is a volunteer-based team committed to providing free medical care to low-income adults with no health insurance. Persons served by these programs include the homeless, women and children through maternal-child and WIC services, and HIV-positive people.

Federally Qualified Health Centers[4] (FQHCs) and Free Clinics or "charity" clinics are the most common types of safety net clinics. FQHCs in Linn County provide primary care, mental/behavioral health, and oral health services. Two Linn County FQHCs operate in Linn County, one in Lebanon and one in Sweet Home, but none in West Linn County. Auxiliary safety net providers such as InReach Clinic also serve Linn County's vulnerable populations. Persons served by these programs include homeless, women and children through maternal-child and WIC services, and HIV-positive people.

[4] FQHCs have a legal mandate or expressly adopted mission to serve all patients, regardless of ability to pay or legal status.

Health Care Professional Shortage Areas

Knowing the number of providers and types of services are very important for gauging the capacity and presence of a health care system. However, an understanding of the geographical distribution of these services helps paint a more accurate picture.

While Linn County enjoys a good ratio of health care providers to overall population, geographic distribution of providers can make it difficult for those with limited transportation to access services. Because rural areas of Linn County have either no or very few medical care providers, portions of Linn County are designated as geographic Health Care Professional Shortage areas (HPSA). Designation as an HPSA means that there is an increased risk of poor access to health professionals.[120] Linn County qualifies in part as an HPSA for primary care, dental health, and mental health.

In addition to the geographic designation, Linn County also has population-based HPSAs for migrant seasonal farmworkers and low income individuals. Migrant seasonal farmworkers and their families are a particularly vulnerable subgroup of the Latino/Hispanic population. Farmworkers have different and more complex health problems than those of the general population. Many of the Latino/Hispanic migrant seasonal farmworkers are documented but have undocumented family members with them. Many are employed in agriculture sectors that provide few or no employment benefits. While most are low income, many immigrants and migrant seasonal farm workers do not qualify for Medicaid due to their residency status or they are unable to access Medicaid due to language, transportation and cultural barriers.[121]

Emergency Responders

Emergency Management Services (EMS) response serve an important role in the community. According to the Oregon Office of Rural Health, the mean travel time to the nearest hospital for rural service areas is 24 minutes. Estimated travel time is calculated from the largest town/city in each of the rural service areas to the nearest town/city with a hospital. This is the protocol unless the city already has a hospital, in which case driving time is defaulted to 10 minutes.[122] Areas in Linn County have a mean travel time to the nearest hospital which is greater than 24 minutes, with the longest mean travel time in West Linn County at approximately one hour.[123]

Medical Services

The following seven indicators provide a snap-shot of the breadth and type of services provided by Samaritan Albany General Hospital (SAGH) from 2010-2012:

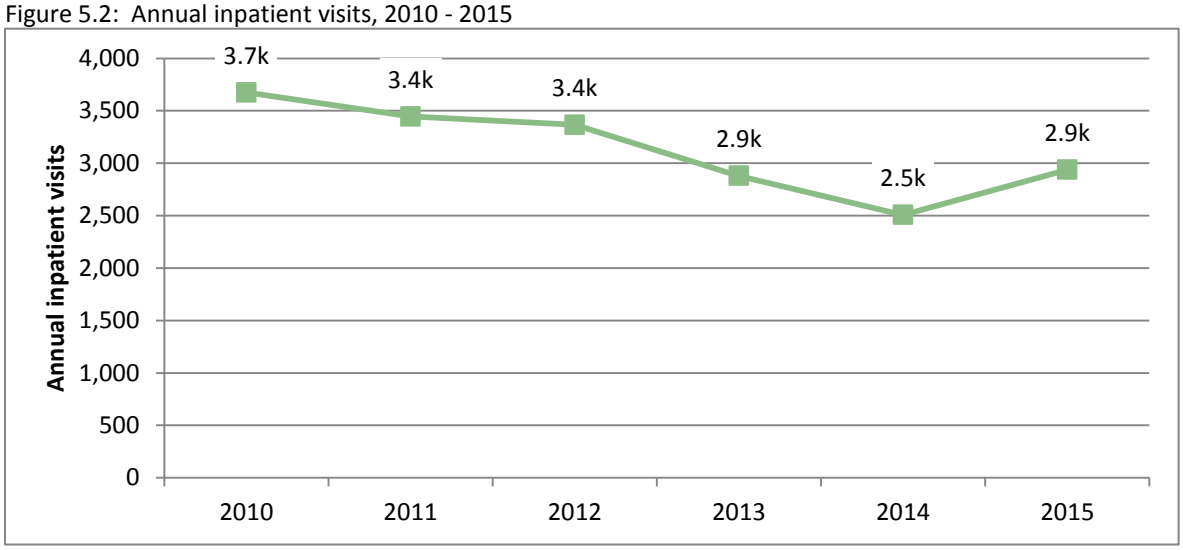
- The number of inpatient visits
- The number of ER visits
- The number of surgeries performed
- The number of infants delivered
- The number of imaging procedures performed

- The number of clinic visits
- The number of home health visits

Inpatient Visits

Inpatient care begins when a doctor makes a formal order to admit a person as an inpatient. The length of inpatient care depends on the severity of the health issue and when the doctor deems it safe for the patient to leave.
From 2013-2015, there were on average 2,770 inpatient visits each year at SAGH. The annual rate decreased about 20 percent from the previous triennium, when on average 3,500 visits were made annually. The following figure (Figure 5.2 illustrates the six year trend.

Figure 5.2: Annual inpatient visits, 2010 - 2015



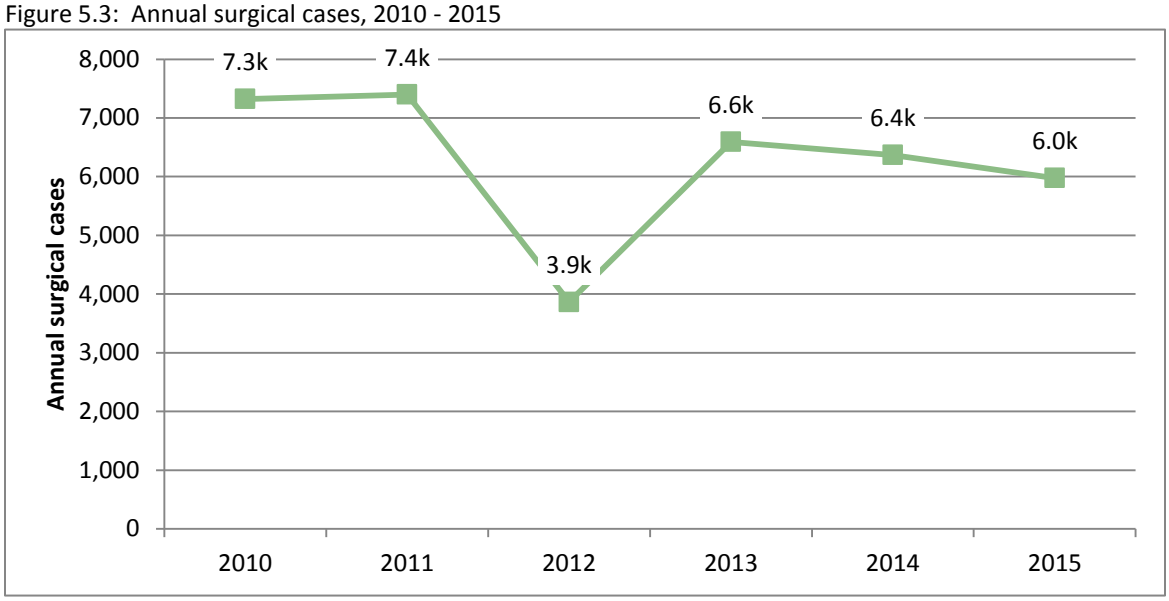
Source: Samaritan Health Services, 2016

Surgical Procedures

Samaritan Albany General Hospital offers surgical services in a number of specialties, including inpatient, outpatient, and minimally invasive surgeries using the best technology available.[124]

From 2013-2015, there were on average 6,300 surgical cases each year at SAGH. There has been an overall decline in the annual number of surgeries performed at SAGH, from 7,300 surgeries in 2010 to 6,000 surgeries in 2015. The following figure (Figure 5.3) illustrates the six year trend.

Figure 5.3: Annual surgical cases, 2010 - 2015

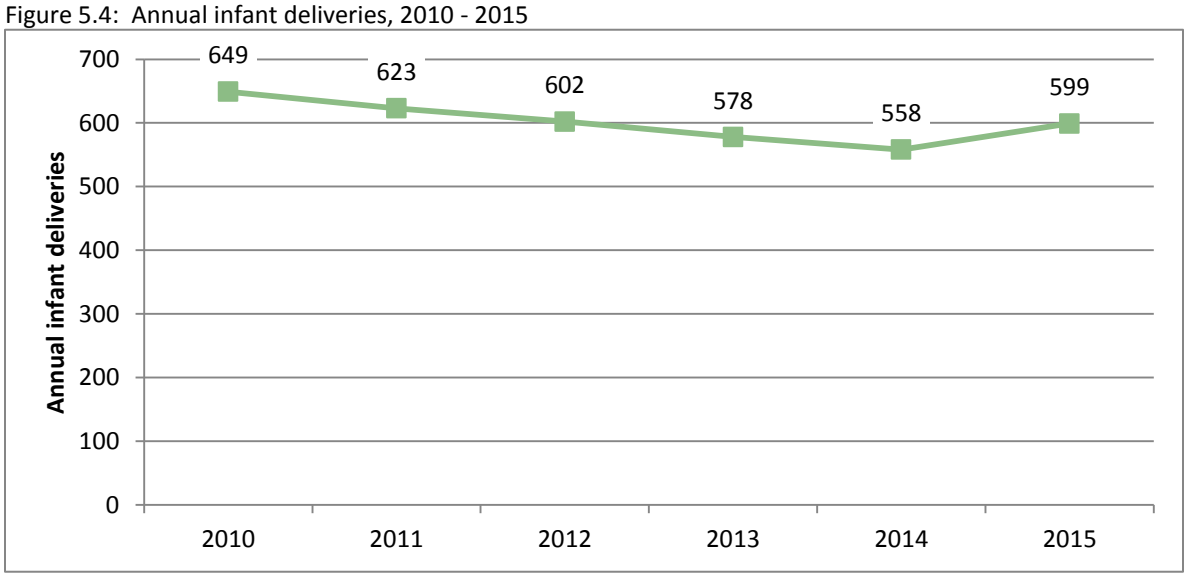


Source: Samaritan Health Services, 2016

Infant Deliveries

The Women's Center at SAGH provides labor and delivery rooms equipped with features and services designed to make mothers as comfortable as possible. They offer educational resources that cover prenatal to postpartum topics and many are offered in Spanish. [125] From 2013-2015, there were on average 578 infant deliveries each year at SAGH. The annual rate declined from 649 deliveries in 2010 to 558 deliveries in 2014. The number of deliveries increased in 2015 to 599, but it is unclear if this increase indicates a reversal of the downward trend. The following figure (Figure 5.4) illustrates the six year trend.

Figure 5.4: Annual infant deliveries, 2010 - 2015



Source: Samaritan Health Services, 2016

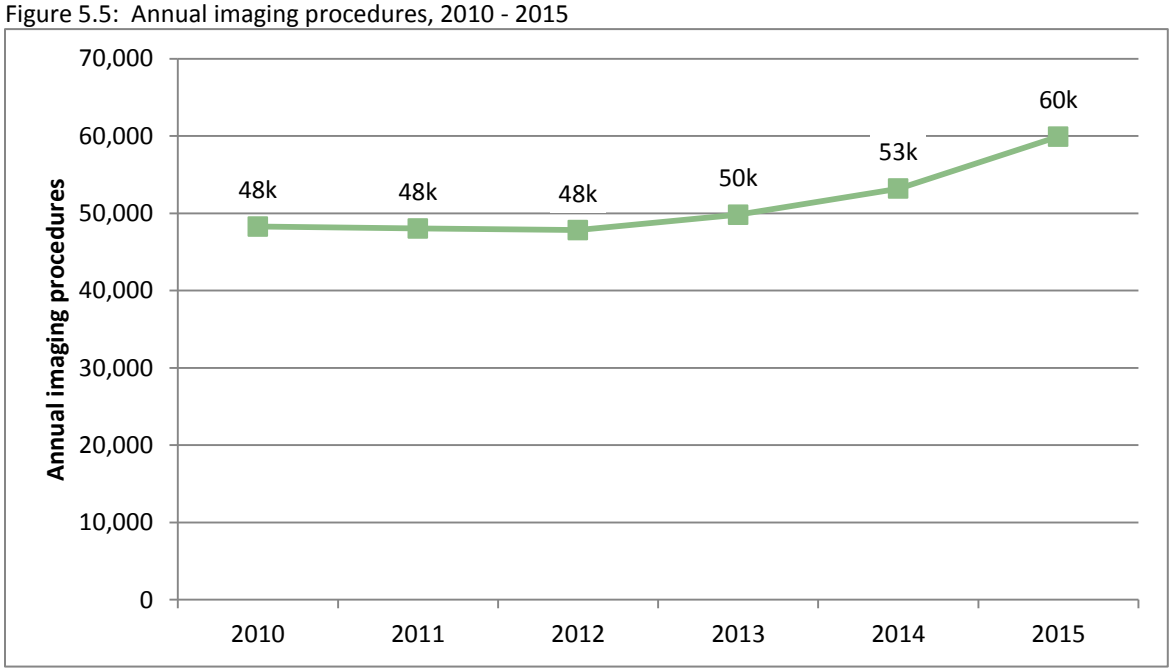
Imaging Procedures

Samaritan Albany General Hospital offers a variety of imaging procedures:

- Angiography
- Cardiac Scoring
- CAT Scan
- Echocardiography
- MRI
- Nuclear Medicine
- PET
- Ultrasound (4-D)
- Virtual Colonography
- X-ray[126]

SAGH has been increasing the number of imaging procedures it conducts in each year. In 2010, SAGH conducted 48,000 imaging procedures, which increased by 25 percent to nearly 60,000 procedures in 2015. The following figure (Figure 5.5) illustrates the six year trend.

Figure 5.5: Annual imaging procedures, 2010 - 2015



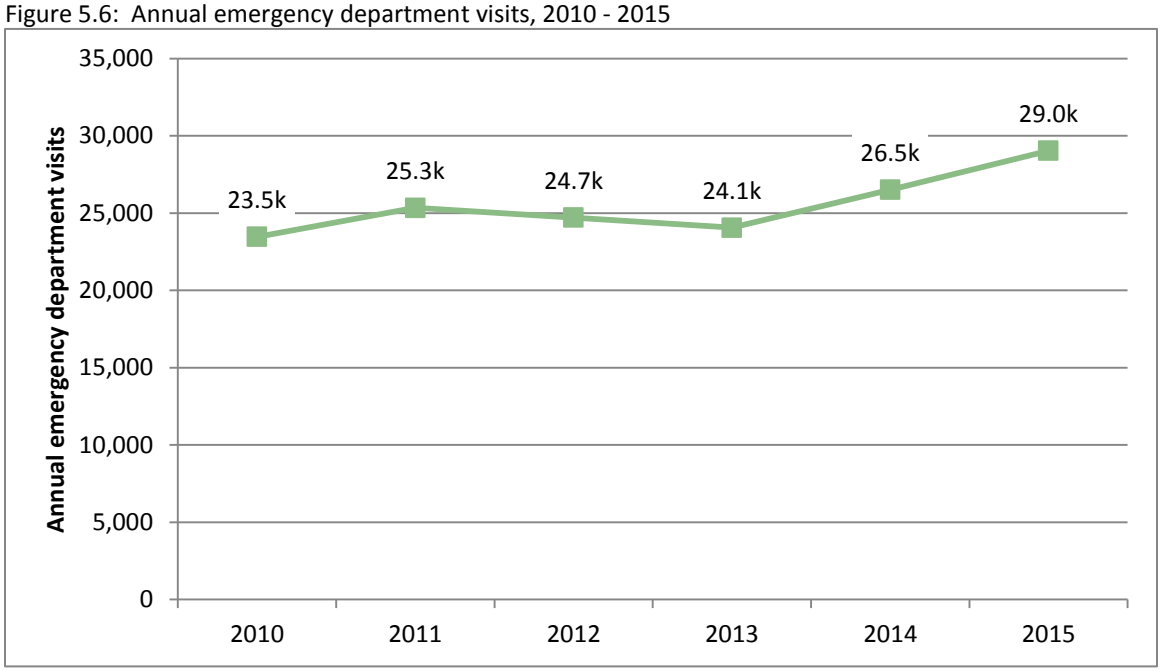
Source: Samaritan Health Services, 2016

Emergency Department Visits

People without health insurance and access to other providers often end up seeking emergency room care. Uninsured adults are more likely than those with private or public health insurance to utilize emergency room care because they lack preventative care and places to receive affordable, accessible care. Lack of access to other providers and adequate health insurance is reflected in rising visits to the emergency room.[127]

From 2013-2015, there were on average 26,500 emergency department visits each year at SAGH, an increase of about 8 percent over the last triennium. The last three years have seen a gradual increase in the number of emergency department visits annually, from 24,100 visits in 2013 to 29,000 visits in 2015. The following figure (Figure 5.6) illustrates the six year trend.

Figure 5.6: Annual emergency department visits, 2010 - 2015



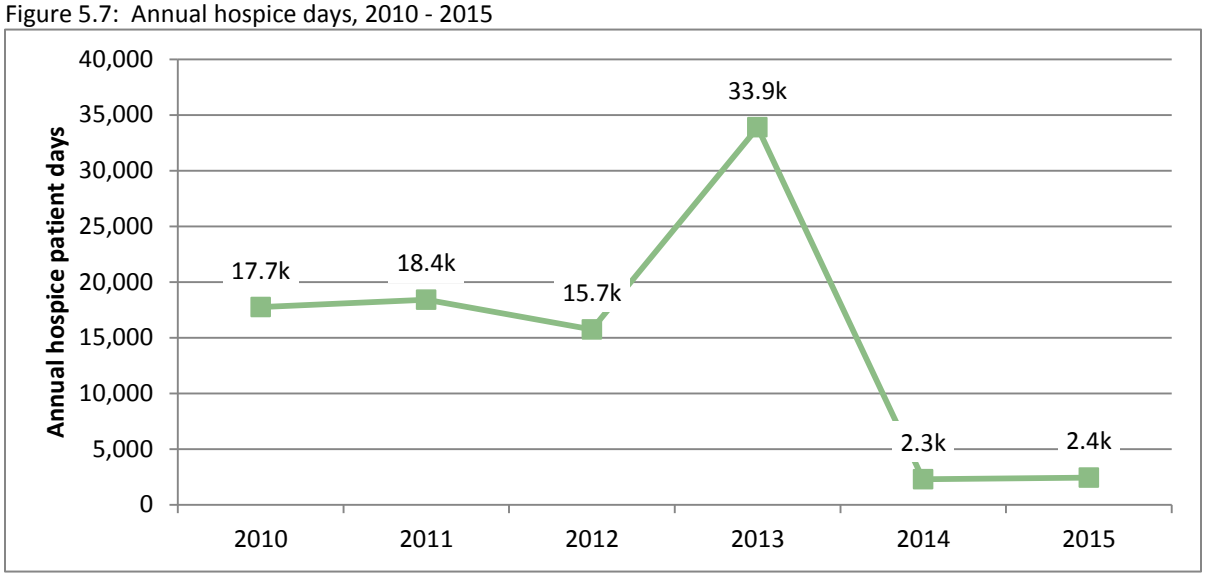
Source: Samaritan Health Services, 2016

Hospice Care

Samaritan Evergreen Hospice offers long-term care resources for patients who are nearing end of life. Hospice services support patients emotionally, spiritually, and physically during this transition. Families of patients are also provided emotional support during this period of grief.[128]

Hospice utilization is measured by the total number of days of hospice care provided. From 2013-2015, the annual hospice days varied greatly. In 2013 there were 33,900 hospice days, roughly double the average annual rate of the previous triennium. However, in 2014 and 2015 hospice utilization decreased to only 2,300 days and 2,400 days, respectively. This annual rate decreased 26 percent the previous triennium, when on average 17,300 hospice days occurred annually. The following figure (Figure 5.7) illustrates the six year trend.

Figure 5.7: Annual hospice days, 2010 - 2015



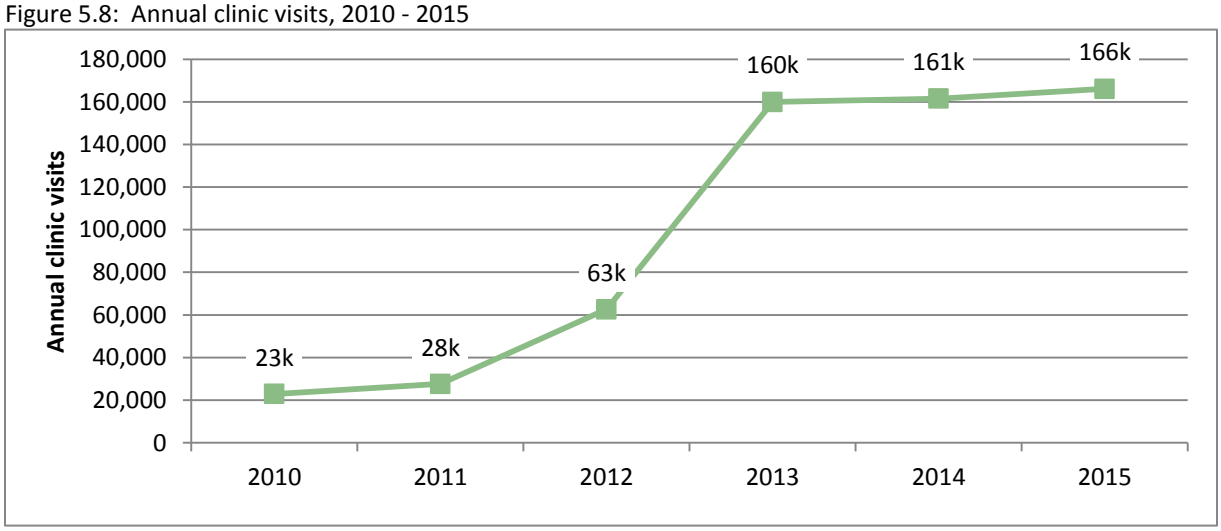
Source: Samaritan Health Services, 2016

Medical Clinics

There are twenty-eight clinics serving the SAGH area. They provide a range of services including family medicine, walk-in/urgent care, and specialty services.

2013 saw a 250 percent increase in the number of clinic visits in the SAGH service area, from 63,000 visits in 2012 to 160,000 visits in 2013. This number has stabilized between 160,000 and 166,000 over the past three years. The following figure (Figure 5.8) illustrates the six year trend.

Figure 5.8: Annual clinic visits, 2010 - 2015



Source: Samaritan Health Services, 2016

Conclusion

Health insurance coverage rates have increased drastically in the past five years. In 2010, 19 percent of Linn County adults were uninsured, and in 2015, that rate had dropped to 2 percent. Childhood uninsurance rates declined from 11 percent to 7 percent over the same time period. Much of the increase in insurance coverage is due to increased enrollment in the Oregon Health Plan, which grew by 13,000 people between 2010 and 2014.

The data presented in this chapter can support an initial understanding and baseline of access to medical care in West Linn County, while calling attention to challenges faced by many in our community when accessing medical care.

Chapter 6
Morbidity and Mortality

Understanding the leading causes of illness and death is the first step on the path to preventing both the loss of life and improving the quality of life within any community. Traditional measures used to evaluate the health of populations are morbidity (incidence of disease) and mortality (deaths). Examining various cancers, heart disease, and other major causes can highlight notable improvement as well as areas in which Linn County is in need of improvement. The more detailed data available about disparities within particular populations and illnesses, the better communities can address these issues effectively in Linn County. Many of the conditions that cause illness and death within Linn County have well-established causes, a number of them rooted in behaviors or risk factors that can be prevented.

Many statistics are aggregated over a set of years in order to report reliable data. When incidence or prevalence rates are reported across many years, the statistic is per person per year. For example, the all-cancer incidence rate in Oregon across 2008-2012 was 448 cases per 100,000 people; this means that in each of the five years between 2008 and 2012, 448 cases were diagnosed for every 100,000 people in the population.

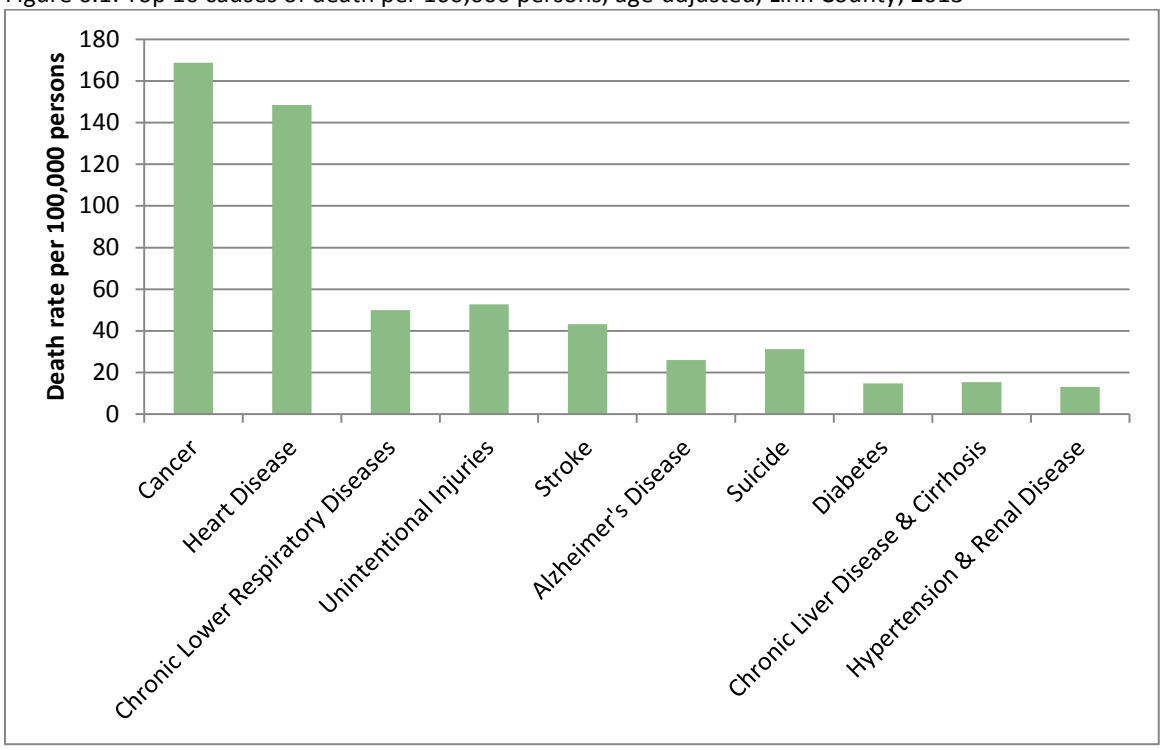
Morbidity and Mortality data is not available for West Linn County, so Linn County figures are reported.

Leading Causes of Death in Linn County

In 2013, the age-adjusted death rate in Linn County was 779 deaths per 100,000 people, compared to 717 deaths per 100,000 people in Oregon. The leading causes of death (for all ages combined) in Linn County are cancer, heart disease, chronic lower respiratory disease, unintentional injuries, and cerebrovascular disease (stroke). Compared with Oregon, Linn County has a similar number of deaths per 100,000 residents for each of its top ten causes of death (Figure 6.1).

Preventable risk factors such as tobacco use, diet, activity and alcohol use contribute substantially to these deaths. For example, in 2013, it is estimated that 26 percent of Linn County deaths were tobacco-related deaths. This proportion is comparable to 22 percent of tobacco-related deaths in Oregon during the same time period.[129]

Figure 6.1: Top 10 causes of death per 100,000 persons, age-adjusted, Linn County, 2013



Source: Oregon Health Authority, Oregon Public Health Assessment Tool, 2013

Chronic Disease and Conditions

Chronic diseases, such as heart disease, stroke, cancer and diabetes are among the most prevalent, costly, and preventable of all health problems. Healthy lifestyles, such as avoiding tobacco, being physically active, and eating well, greatly reduce a person's risk for developing chronic illnesses. Research shows that access to resources that support healthy lifestyles, such as nutritious food, recreational opportunities, and high quality and affordable prevention measures (including screening and appropriate follow-up) saves lives, reduces disability, and lowers medical costs.[130]

Oncology - Cancer

Cancer is the leading cause of death in Linn County and in Oregon.[131] Five types of cancer are discussed in the section: lung, colorectal, breast, prostate, and pancreatic. Lung cancer is the most common cause of cancer death for Oregonians, followed by colorectal cancer and breast cancer.[132] Pancreatic cancer has a very high mortality rate, in part due to the likelihood of a late diagnosis after the cancer has already progressed. Prostate cancer is a common cancer among men.

Linn County's annual rate of newly diagnosed cancer cases is similar to the rate in Oregon, with Linn County having 477 diagnoses per 100,000 individuals each year.

Linn County's incidence of tobacco-related cancer is significantly higher.[133] Data for all cancer and tobacco related cancer incidence are from different years and are therefore not directly comparable.

Cancer rates also vary between different racial and ethnic groups. In Oregon, prevalence of cancer (the proportion of the population living with cancer) varies from a low of 3.6 percent among Asians and Pacific Islanders, to a high of 11.4 percent among American Indians and Alaska Natives.

Between 2011 and 2013, the Linn County mortality rate from all cancers was 182 deaths per 100,000 people per year.

Lung and Bronchial Cancer

Lung and bronchial cancers are closely related, and this section will combine them both as lung cancer. Lung cancer incidence in men is steadily declining as a result of decreasing smoking rates, but the incidence in women remains relatively flat.[134] Lung cancer is the deadliest cancer in Oregon, accounting for 27 percent of cancer deaths in the state in 2013; a number which includes tobacco and non-tobacco caused lung cancers.[135] The rate of lung cancer has remained fairly constant in Linn County and the United States over time.

In Linn County, smoking declined gradually from 2004 to 2011, which has major implication for cancer rates, since smoking is the leading cause of lung cancers.[136] The lung and bronchial cancer incidence rate in Linn County was 73 per 100,000 persons per year from 2008-2012 compared to 61 per 100,000 people in Oregon. Mortality rates are also disparate in Linn County compared to the state. Linn County has a mortality rate due to lung cancer at 55 per 100,000. Oregon has a mortality rate of 47 per 100,000.

Breast Cancer

Oregon has the 7th highest incidence rate for breast cancer in the United States.[137] Although significant improvements have occurred in early detection and treatment, breast cancer is still the leading cause of death for women in Oregon. Only a small fraction of breast cancer cases can be linked to genetics.[138]

The 2008-2012 age-adjusted incidence of breast cancer among women was 132 diagnoses per 100,000 women in Linn County compared to 128 diagnoses per 100,000 women in Oregon. In 2008-2012, the female breast cancer mortality rate in Linn County (27 per 100,000 women) was higher than the Oregon mortality rate due to female breast cancer (21 per 100,000 women).[139] Linn County and Oregon had mortality rates above the Healthy People 2020 target of 20.7 deaths per 100,000 females.[140]

Prostate Cancer

The 2008-2012 incidence of prostate cancer in Linn County was 122 per 100,000 men. The mortality rate for Linn County, however, was the third highest in the state at 26 per 100,000 men, compared to the state mortality rate of 23 per 100,000 men.[141] These rates do not meet the Healthy People 2020 objective to reduce the mortality rate due to prostate cancer 22 deaths per 100,000 men.[142]

Colorectal Cancer

The age-adjusted incidence of colorectal cancer in Linn County is 39 per 100,000 individuals, similar to the state incidence. The Linn County mortality rate (14 per 100,000) is also similar to the state rate. Linn County has achieved the Healthy People 2020 target to reduce the mortality rate due to colorectal cancer to 14.5 deaths per 100,000 people.[143]

Pancreatic Cancer

In 2008-2012, the annual incidence rate for pancreatic cancer in Linn County was 14.5 per 100,000 persons, the second highest incidence rate of pancreatic cancer in Oregon.[144] In contrast with the other cancers discussed in this section, pancreatic cancer mortality rates are close to incidence rates, with rates of 10.7 per 100,000 in Linn County and 10.9 per 100,000 in Oregon. Pancreatic cancer is difficult to diagnose before it has advanced, so survival rates tend to be lower than for other common cancers. One consequence of similarities in incidence and mortality rates is the potential for mortality rates in a given year or set of years to exceed incidence rates. This is because the cancer may be diagnosed in a year prior to the year of death.

Cancer Screening

Research shows that screening for cancer is effective in reducing serious consequences of the disease, which is generally more treatable when detected early. Breast and cervical cancer screening rates in Linn County is fairly consistent with state-level screening rates (Table 6.1). Additional data are needed to identify rates of screening among race/ethnic populations, age group and income level, as risk factors differ among different populations.

Table 6.1: Age-adjusted percent of cancer screening in Linn County, and Oregon, 2010-2013

Cancer Screening Practice	Linn County	Oregon
Mammogram within past 2 years (women 50-74 years old)	74.9%	75.3%
Pap test within past 3 years (women 21-65 years old)	82.0%	81.7%
Current on colorectal cancer screening (50-75 years old)*	63.4%	61.1%

Source: Oregon Health Authority, Health screenings among Oregon adults, 2010-2013
**Current on colorectal cancer screening includes the following: having a fecal occult blood test (FOBT) in the past year; a colonoscopy within the past 10 years; or, a sigmoidoscopy within the past 5 years as well as an FOBT within the past 3 years.*

Heart Disease and Stroke

After cancer, heart disease is the largest contributor to the mortality rate in Linn County and in Oregon. When combined with stroke and adjusted for age, diseases of the circulatory system are the leading causes of death in Linn County and Oregon.

Cardiovascular Disease and Stroke

The heart attack incidence in Linn County is 99 per 100,000 persons.

Numerous health conditions and behaviors contribute to the potential for heart disease and stroke. The prevalence of these factors are listed below:

- High blood pressure: 26 percent,
- High blood cholesterol: 28 percent,
- Diabetes: 7 percent
- Obesity: 33 percent
- Lack of exercise: 21 percent, and
- Smoking: 20 percent.[145]

Many of the effects of heart disease can be reversed with healthy eating, exercise, avoidance of tobacco, and stress reduction. In addition to high blood pressure, high cholesterol, and diabetes being critical health factors of heart disease and stroke, social and economic factors are also important. For example, in the U.S., low-income adults are 50 percent more likely to suffer heart disease than top wage earners, even when other risk factors such as cholesterol or smoking, are taken into account.[146]

Heart Disease Mortality

Across Oregon, the death rate for heart disease is higher in rural areas than urban areas.[147] Mortality rates are very different in Linn County; in 2013 Linn County (148 per 100,000 persons) had higher cardiovascular disease mortality rates than Oregon (135 per 100,000 persons).[148]

Stroke Mortality

In general, stroke mortality rates in Linn County and in Oregon have not achieved the Healthy People 2020 target of a reduction to 34.8 deaths per 100,000 persons (Figure 6.15).[149] However, Linn County's mortality rate is 43 deaths per 100,000 people, as opposed to Oregon's rate of 37 deaths per 100,000 people.

Diabetes

Diabetes in Adults

There are two types of diabetes identified by the medical community. Type 1 diabetes is a hormonal condition in which the body does not produce enough insulin to regulate the conversion of sugar and starches into energy. Type 1 diabetes is caused by genetic and unknown factors and is usually diagnosed in children.

In Type 2 diabetes, the body develops resistance to insulin, so that dietary sugar absorbed into the bloodstream is not converted into glycogen at a healthy rate. There are both genetic risk factors and behavioral risk factors for developing type 2 diabetes. Because diabetes can cause serious health complications, it is important to prevent type 2 diabetes through healthy life choices and to catch early through health screenings.[150]

Hereafter, type 2 diabetes will be referred to as diabetes.

Prevalence of diabetes among adults in Linn County was 7.3 percent from 2008-2011.[151] This estimate may be conservative, however, as many people are unaware of their status. Diabetes often develops gradually, and symptoms and complications can take years to manifest.

Diabetes Mortality

Overall, 2013 age-adjusted annual diabetes mortality rates have been consistently higher in Linn County (31 per 100,000) than they have been in Oregon (23 per 100,000). These rates, however, are lower than the national diabetes mortality rate and meet the Healthy People 2020 objective of no more than 66.6 deaths per 100,000 persons.[152]

Alzheimer's Disease

Alzheimer's disease is the most common form of dementia, which is a general term for loss of memory and other intellectual abilities serious enough to interfere with daily life. Alzheimer's disease accounts for 60 to 80 percent of all cases of dementia. Alzheimer's disease is also terminal, and is the 6th most common cause of death in Linn County. In 2013, the Linn County cause-specific mortality rate of 26 deaths per 100,000 individuals was similar to the mortality rate in Oregon.

Arthritis

Arthritis continues to be the most common cause of disability in the United States, affecting one in five Americans. Arthritis consists of over 100 different diseases and conditions that affect the joints, surrounding tissues and other connective tissues. The two most common types are osteoarthritis and rheumatoid arthritis.

The age-adjusted percentages of adults in Linn County who report an arthritis diagnosis is 30 percent, compared to Oregon at 25 percent.[153]

Asthma

Over the past 20 years, asthma has become one of the most common chronic diseases in the United States. Oregon has one of the highest asthma rates in the nation.[154] Asthma results in direct health care costs (e.g., hospitalizations and emergency department visits) and indirect costs (e.g., missed school and work days and days of restricted activity), and affects the quality of life for people with asthma and their families.

Prevalence of Asthma in Adults

For the past 10 years, the percent of Oregonians with a current asthma diagnosis has been rising slowly. Oregon ranked among the top six states for the highest percentage of adults with current asthma diagnoses in 2011.[155]

Two important risk factors, tobacco use and obesity, contribute to the likelihood of an asthma diagnosis. Oregon counties with asthma levels higher than the state average tend to also be counties with high smoking rates.[156] Likewise, counties with high levels of obesity also tend to have increased prevalence and incidence of asthma. Linn County's adult asthma prevalence is higher than Oregon's at 12.3 percent.[157]

Infectious Diseases

Prevention and control of infectious illnesses rank among the greatest health advances of the 20th century. The World Health Organization defines infectious diseases are those that are caused by bacteria, viruses, parasites, or fungi; these diseases can be passed from person to person.[158] Some are transmitted via ingesting contaminated food or water. Many are spread by microorganisms in coughs or sneezes, while others result from exposures in the environment or insect bites. Diseases that spread from animals are called zoonotic infections.

All physicians, health care providers, and laboratories in Oregon are required by law to actively report confirmed or suspect diagnoses of over 50 infectious diseases and conditions to their local health departments.[159] These reports are directed through county health departments to the Oregon Public Health Division which collects and distributes data to inform health departments, physicians and the public. Reporting enables appropriate public health follow-up for patients, helps identify outbreaks, and provides a better understanding of disease transmission patterns. Some diseases are subject to restrictions on school attendance, day care attendance, patient care, and food handling. Communicable disease nurses in Linn, Benton, and Lincoln Counties investigated 1,336 reports of reportable communicable diseases during 2013, a rate of over 25 investigations every week.[160]

Respiratory Illnesses

Respiratory illnesses such as the influenza virus, commonly referred to as the flu, spread from person to person when droplets from a cough or sneeze of an infected person move through the air and enter the mouth or nose of people nearby.

The common cold[5] and influenza are the most common respiratory illnesses. However, local, state, and national statistics for these diseases are difficult to ascertain because doctors and laboratories are not required to report them to public health authorities. This is because most people experience only mild, short-term illness, and do not seek medical attention. The illnesses are difficult to differentiate, and most are treated symptomatically rather than curatively. The Oregon Health Authority reports influenza and pneumonia mortality jointly; these rates have been steadily declining in Linn County, from 15 deaths per 100,000 persons in 2007 to 8 deaths in 2013.

Less common, but more serious respiratory illnesses include pneumonia, pertussis (whooping cough), and tuberculosis. In general, infectious tuberculosis is extremely rare in Linn County. Between 2007 and 2013, an average of 3-4 cases were reported annually.[161] Tuberculosis cases are actively managed and curative therapy is overseen by public health nurses.

[5] More than 200 viruses cause what is typically considered the common cold, including rhinovirus, coronavirus, respiratory syncytial virus, and the parainfluenza virus.

Pertussis is a very contagious bacterial infection that causes a coughing illness which may last 6 to 10 weeks or longer. It is an endemic disease with epidemic peaks occurring every 2 to 7 years and has proven persistent despite widespread childhood immunization. There was a sharp rise of pertussis in the United States during 2012. Oregon reported more than twice as many pertussis cases in 2012 as in 2011. The number of cases of pertussis in Linn County fluctuates annually; an outbreak in 2012 pushed the incidence above the historical average of approximately 14 diagnoses per 100,000 people per year.

Foodborne Illnesses

The Centers for Disease Control and Prevention (CDC) estimate that each year, 1 in 6 Americans (48 million people) get sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases.[162] The leading causes of foodborne illness in the United States are due to exposure to norovirus, Salmonella, Campylobacter, and *Clostridium perfringens*. Norovirus, Salmonella, and Campylobacter are also among the leading causes of death due to foodborne illness.[163] The incidence of campylobacter in Linn County has historically ranged between 15 and 32 cases per 100,000 each year. In contrast, the incidence in Oregon has stayed below 25 cases per 100,000 people between 2007 and 2013.

Escherichia coli infections, most commonly 0157:H7 (a specific strain of *E. coli*), is another significant causative organism. Around 5 to 10 percent of those who are diagnosed with the infection develop potentially life-threatening complications. Linn County's rate of *E. coli* infections was 22 per 100,000 persons in 2013.[164]

Sexually Transmitted Infections (STIs)

Sexually transmitted infections (STIs, also sometimes called sexually transmitted diseases, STDs) are infections that can be passed from one person to another through sexual contact. Untreated STIs can have consequences for and individual's health such as infertility and even death. Testing for STIs is a very effective mechanism for preventing the spread of STIs. Even incurable STIs, like HIV, are much less likely to be spread if those affected by the infection receive proper treatment. However, untested individuals are unable to receive the treatment they need and are also much more likely to pass on the infection to others.

Chlamydia and gonorrhea are the most common STIs in Linn County. Approximately 80 to 90 percent of chlamydia infections and about 50 percent of gonorrhea infections are asymptomatic in women and may go undiagnosed. If left untreated, these infections may lead to pelvic inflammatory disease, which can cause tubal infertility, ectopic pregnancy and chronic pelvic pain.[165]

Chlamydia

Chlamydia is the most common reportable illness in Oregon, with infection rates steadily increasing over the past decade. In Linn County reported rates of chlamydia are more than twice as high in women as in men; for every 10 men diagnosed with chlamydia, 25 women are diagnosed. Current guidelines recommend chlamydia screening in women who are not symptomatic, but do not recommend the same screening for men without symptoms. This likely causes the higher rate of reported chlamydia cases among women, rather than a difference in infection rates by gender.[166] Overall, Linn County had 335 infections per 100,000 persons in 2013.

Gonorrhea

Another reportable sexually transmitted infection that is present in Linn County is gonorrhea. In general, women are more likely than men to become infected with gonorrhea after exposure. However, as with chlamydia, women are less likely than men to develop symptoms following infection.[167] Gonorrhea infection rates in Linn County were 11 per 100,000 persons in 2013.

The key risk factor for sexual infections is age. Linn County residents between 15 and 24 years of age contract chlamydia at a rate 4.8 times higher than the infection rate among all ages. This trend holds for region infection rates as well. Gonorrhea infection rates are somewhat less influenced by age; 15-24 year olds in Linn County have infection rates 3.1 times as high as the infection rate among all ages (Table 6.2).

Table 6.2: Age-specific incidence rates of chlamydia and gonorrhea, diagnoses per 100,000 persons in Linn County, 2013

	Chlamydia	Gonorrhea
Age	Linn County	Linn County
<15	335	11
15-24	1,611	34
25-44	374	14
45-64	12	6
65+	0.0	0.0

Source: Oregon Health Authority, Oregon Public Health Assessment Tool, 2013

HIV/AIDS

HIV/AIDS (human immunodeficiency virus/ acquired immunodeficiency syndrome) remains an important public health problem in Oregon. From 1981 through 2010, 8,753 Oregonians were diagnosed with HIV infection. Of those, 40 percent (3,540) died. Fortunately, death rates have decreased dramatically since the development of effective antiretroviral therapies. HIV/AIDS is now managed as a serious but chronic disease. As a result, the number of Oregonians living with HIV infections has increased from 2,720 in 1997 to 5,213 in 2010. New

HIV diagnoses in Oregon are most common among 35–39 year old males. Between 2009 and 2013, 21 individuals were diagnosed in Linn County. The 5-year incidence of HIV in Linn County was 5 cases per 100,000 persons per year, about two-thirds of the state's incidence (6.5 cases per 100,000 persons per year) during that time period.[168]

Injury and Violence

Violent Crime

Violent crimes are defined as offenses that involve face-to-face confrontation between the victim and the perpetrator, including homicide, rape, robbery and aggravated assault. High levels of violent crime compromise physical safety and psychological well-being. Crime rates can also deter residents from pursuing healthy behaviors such as exercising out-of-doors.[169]

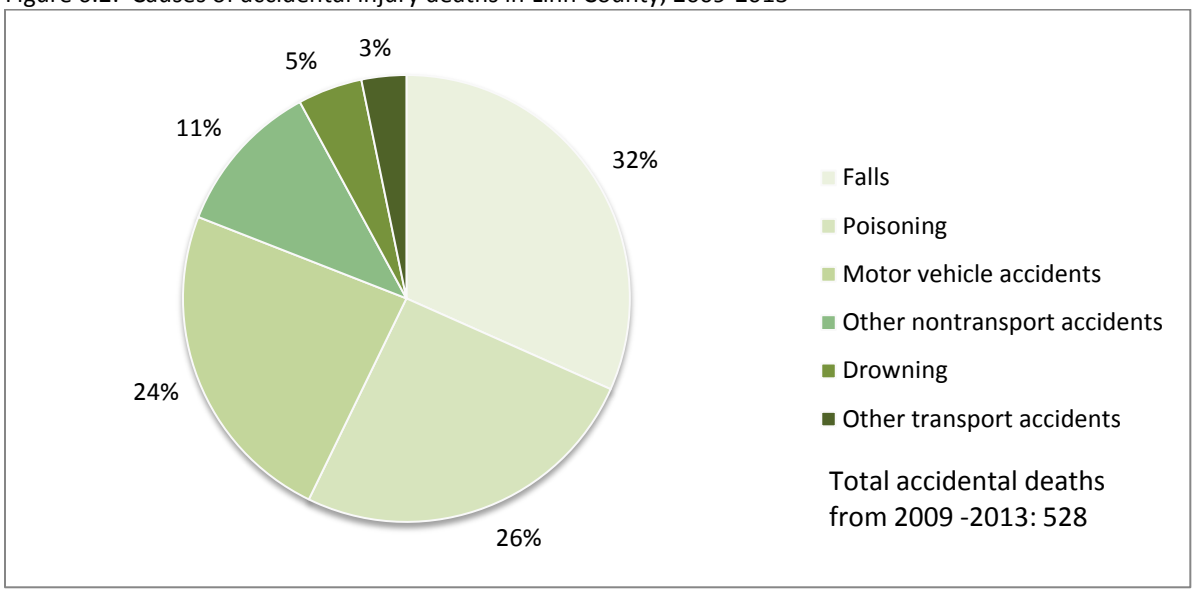
Linn County had violent crime rates of 118 crimes per 100,000 people from 2010-2012. This was well below the Oregon rate of 249 crimes per 100,000 people. This high rate was driven mostly by assault offenses of 73 recorded assaults in 2012 in Linn County.[170] In 2013, Linn County recorded 24 violent deaths, including suicide, homicide, and undetermined causes. This was a rate of 21 violent deaths per 100,000 residents, about equal to the rate in Oregon.[171]

Unintentional Injury Mortality

Injuries are the number one cause of death among people under the age of 44 in Oregon and the fifth leading cause of death overall. Injury is also the number one cause of disability at all ages.[172] Most of the events resulting in injury, disability, or death are preventable. According to Healthy People 2020, injuries and violence have an impact on the well-being of people by contributing to premature death, disability, poor mental health, high medical costs, and high unproductivity.[173]

Linn County injury deaths follow the same pattern as the state (Figure 6.2). Falls contributed to 32 percent of accidental deaths between 2009 and 2013, followed by poisoning and motor vehicle accidents. Together, these three causes comprise 82 percent of accidental deaths in Linn County.

Figure 6.2: Causes of accidental injury deaths in Linn County, 2009-2013



Source: Oregon Public Health Assessment Tool, 2009-2013

Injury mortality is higher among males than females in all age groups in Oregon. Injury mortality rates increase with age for both sexes, starting at age 5.[174] The risks of different major types of injury fluctuate through a person's life. These include, among other types, falls, unintentional poisonings, motor vehicle accidents, and self-harm.

Mental Health Conditions

Mental health disorders are experienced by people of all ages, from early childhood through old age. Research suggests that only about 17 percent of U.S. adults are considered to be in a state of optimal mental health. An estimated 26 percent of Americans age 18 years and older are living with a mental health disorder in any given year, and 46 percent will have a mental health disorder during their lifetime.[175] These disorders include, among others, anxiety, depression, behavior disorders, persistent suicidal thoughts, schizophrenia, and Alzheimer's disease.[176] County Health Rankings reports the number of poor mental health days each month, both as a proxy for mental health diagnoses and as an indicator of overall mental wellness. Residents of Linn County reported an average of 3.3 poor mental health days over the previous month. This measure is based on survey responses to the question: "Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"[177]

Oregonians across the state reported an average of 3.3 poor mental health days. The Healthy People 2020 benchmark is 2.3, placing Linn County and the state in the worst 10 percent for this measure, with clear room for improvement. From 2008 to 2011, 65 percent of Linn County residents reported no poor mental health in the past 30 days. These rates are statistically equivalent to the statewide rate of 65 percent.[178] From 2010 to 2013, self-reported depression

rates in Linn County were 28 percent. Linn County depression rates were close to the state rate of 25 percent.[179]

Suicide

Suicide is a death resulting from the intentional use of force against oneself. As a public health concern, it relates to both injury and violence, and mental health. However, while many unintentional injuries can be prevented by making one's environment safer, suicide can also be effectively prevented by providing treatment to those with mental health disorders. Therefore, suicide is discussed in the context of mental health. Suicide is an important public health problem in Linn County. It is also the leading cause of injury-related death in the state and is the 9th leading cause of death for Oregonians. There are more deaths in Oregon due to suicide than due to car crashes. The suicide rate in Linn County was 16 suicides per 100,000 residents in 2013. The statewide rate in 2013 was 18 per 100,000 persons.[180] Additional detail is given in Chapter 7.

Conclusion

Understanding the leading causes of illness and death is a first step on the path to preventing both the loss of life and improving the quality of life within Linn County. While leading causes of death in Linn County closely mirror those of the state, examining various cancers, heart disease, and other major causes reveal areas of vast improvement, as well as areas in which Linn County is doing more poorly than the state average. Data on many sub-populations are noticeably absent throughout this chapter. As discussed throughout the chapter, many of the conditions that cause illness and death within Linn County have well-established causes, with a number of them rooted in behaviors or risk factors that can be prevented. The following chapter takes a closer look at behaviors and risk factors that affect a person's health and well-being across the life course.

Chapter 7
Health Across the Life Course

A life course framework helps to illuminate the ways in which experiences during key stages of life contribute to health outcomes throughout an individual's lifetime.[181] This framework builds upon the previously discussed social determinants of health to illustrate that a person's environment and the systems in which they live can affect health outcomes differently during different stages of life. For example, there are ways in which maternal and infant disparities contribute to childhood and adolescent experiences which, in turn, contribute to adult and older adult health outcomes. This can have effects not only on an individual's life, but can also span generations, creating and contributing to persistent disparities within the community. By taking a look at the ways in which certain life stages and health factors interact, new opportunities to improve community health can be uncovered. This chapter addresses health behaviors such as engaging in physical activity; maintaining healthy eating habits; being tobacco-free; and using alcohol and prescription drugs appropriately. This larger view illuminates ways that people protect and promote health for others, including assuring a healthy start for children, preventing and managing chronic conditions, preventing disease and injury, and promoting good mental health.

This chapter is organized to follow the course of a person's life. Factors that influence the health of a mother have a lasting effect on the health of her children as infants, adolescents, and adults. The behavioral and lifestyle choices of children and adolescents affect their wellbeing throughout life, as do other health factors that arise during childhood, such as oral care and mental health. Adults continue to influence their health by adopting healthy behaviors or discontinuing unhealthy ones. They may now feel the effects of health conditions that began earlier in life but took time to develop, or reap the benefit of the healthy choices that they have made. Living a healthy life as one ages is very possible, and it is never too late to improve one's health. However, the elderly are also at risk for health issues that may not affect younger people, including falls, mental decline, or elder abuse.

West Linn County data is not available for these data, so Linn County figures are reported.

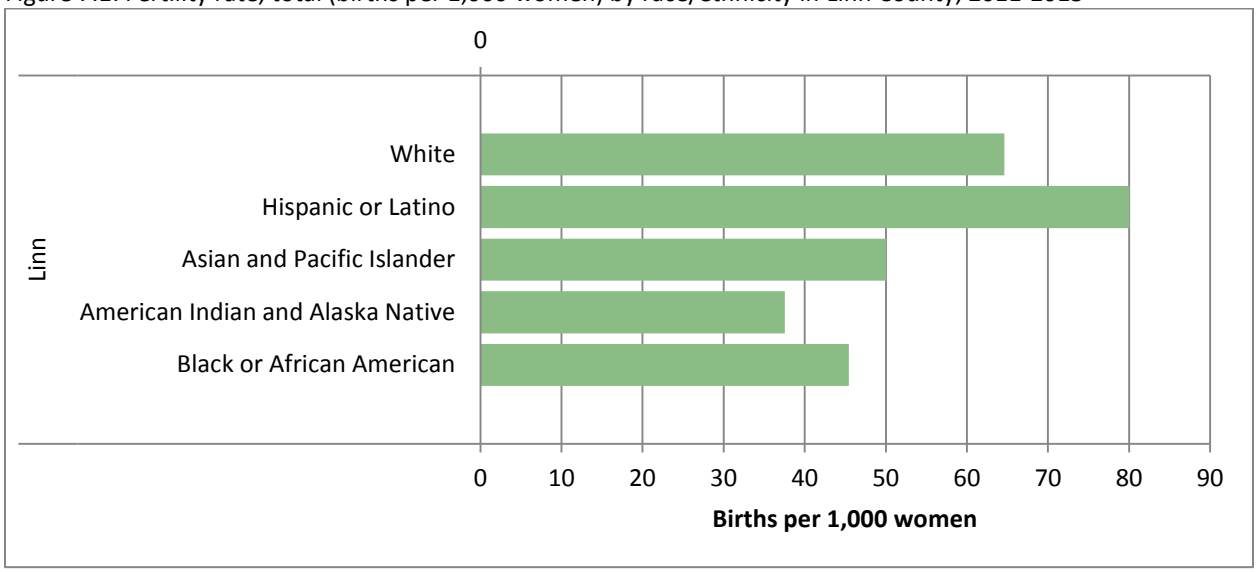
Maternal and Infant Health

Since healthy aging starts at the beginning of one's life, public health professionals can assess the health of a community by starting with the health of mothers and infants during and immediately after pregnancy. This section takes a closer look at maternal and infant health outcomes and various factors that impact them. All fertility data is based on the county of residence, not the county where the infant was born.

Fertility Rate (Total Fertility Rate, TFR)

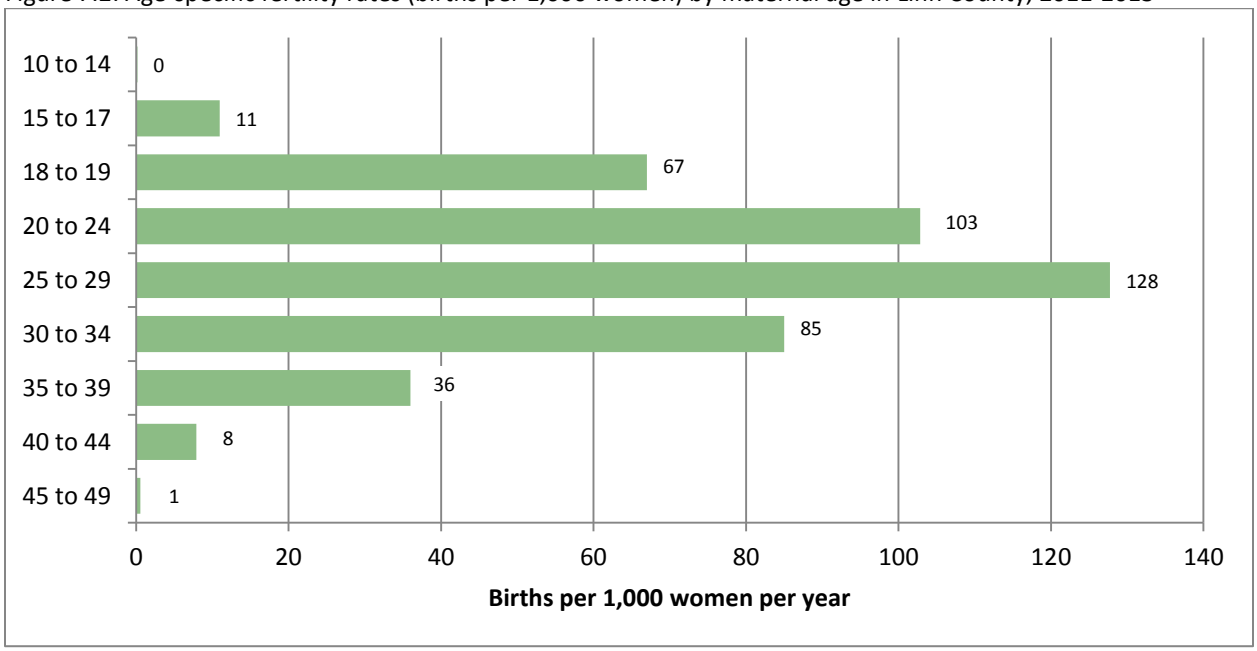
The total fertility rate (TFR) is the total number of births per 1,000 women in a given year. The TFR is based on the age-specific fertility rates of women in their "child-bearing years", which is ages 15 to 44. Linn County has a TFR that is higher than the state's. Among racial/ethnic groups, women who identify as Hispanic or Latina have the highest TFR in Linn County of 80 births per 1,000 women (Figure 7.1).

Figure 7.1: Fertility rate, total (births per 1,000 women) by race/ethnicity in Linn County, 2011-2013



Source: Oregon Healthy Authority, Center for Health Statistics, Birth Certificate Data, 2011-2013
Note: Fertility rate data is based on county of residence, not county of birth

Figure 7.2: Age-specific fertility rates (births per 1,000 women) by maternal age in Linn County, 2011-2013

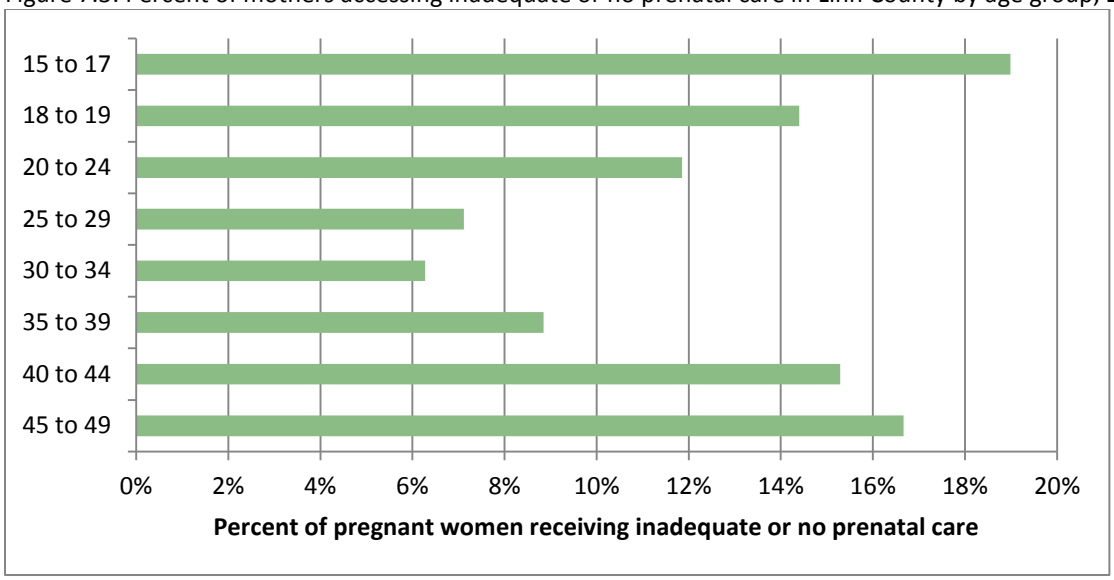


Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2011-2013

Prenatal Care and Healthy Pregnancy

In Linn County from 2011 to 2013, a total of 90.9 percent of all mothers were able to access adequate prenatal care. As shown in Figure 7.3, younger mothers are less likely to access adequate prenatal care than older mothers. Compared with women between 25 and 39, women under the age of 25 are nearly twice as likely to receive inadequate or no prenatal health care in Linn County.[182]

Figure 7.3: Percent of mothers accessing inadequate or no prenatal care in Linn County by age group, 2011-2013



Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2011-2013

There also exist disparities in prenatal care access among mothers of different race/ethnic groups in Linn County. Overall, mothers who identify as White, non-Hispanic tend to access adequate prenatal care more frequently when compared to all other racial/ethnic groups (Figure 7.4).[183]

Unhealthy Behavior during Pregnancy

Smoking during Pregnancy

Smoking during pregnancy is the single most preventable cause of illness and death among infants. Smoking during pregnancy increases the risk of stillbirth, low birth weight, sudden infant death syndrome (SIDS), and preterm birth. It also contributes to cognitive and behavioral problems, and respiratory problems in both the mother and the child.[184]

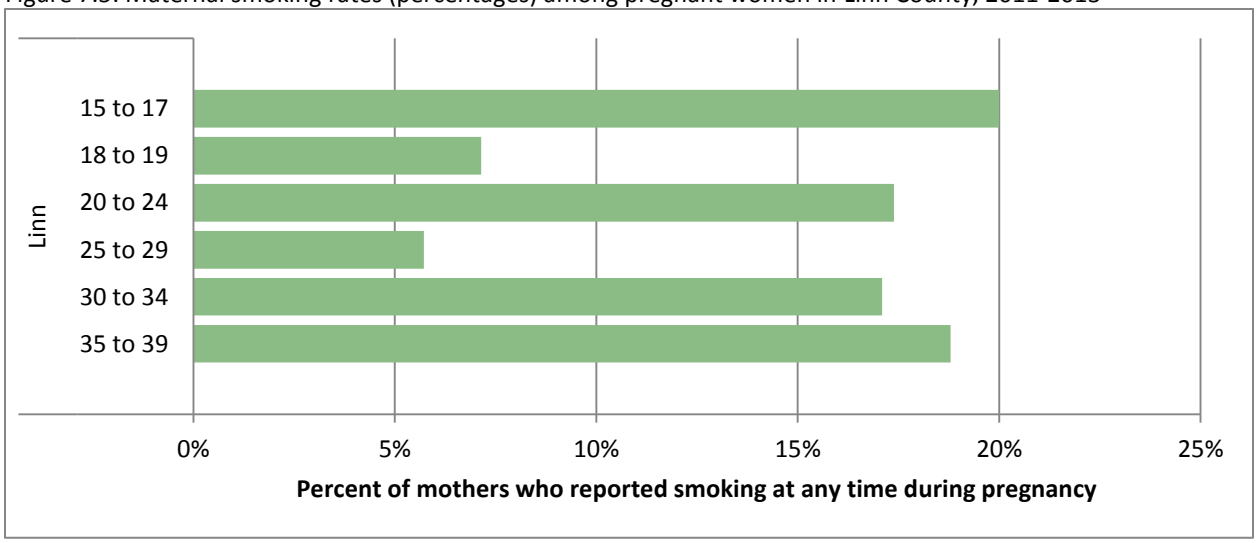
On average in 2011-2013, 17 percent of mothers smoked during pregnancy in Linn County (Table 7.1). However, there is a notable difference in smoking rates when comparing age groups, in which the rate of smoking among pregnant women under the age of 25 is over two times the rate of smoking among pregnant women over the age of 25.

Table 7.1: Maternal smoking rates (percentages) among pregnant women by age in Linn County, 2011-2013

Population (by age)	Linn County
15 to 17	20%
18 to 19	7%
20 to 24	17%
25 to 29	6%
30 to 34	17%
35 to 39	19%
40 to 44	0%
Total	17%

Source: Oregon Health Authority, Center for Vital Statistics, 2011-2013

Figure 7.5: Maternal smoking rates (percentages) among pregnant women in Linn County, 2011-2013



Source: Oregon Health Authority, Center for Vital Statistics, 2011-2013

Smoking cessation counseling and programs offered during prenatal care can provide effective assistance to encourage pregnant women to quit smoking. There currently are no established smoking cessation programs specifically for mothers in Linn County, but efforts are being made to make them available at the county level.

Alcohol Use During Pregnancy

Drinking alcohol during pregnancy can cause miscarriage, stillbirth, and a range of lifelong disorders, known as fetal alcohol spectrum disorders (FASDs). Children with FASDs can have a host of problems, including poor coordination, hyperactivity behavior, difficulty paying attention, poor memory, difficulty in school, learning disabilities, speech and language delays, poor reasoning and judgment skills, vision or hearing problems, and complications with the heart, kidney, or bones. There is no known safe amount of alcohol to drink during pregnancy, and no known safe time to drink alcohol during pregnancy.[185]

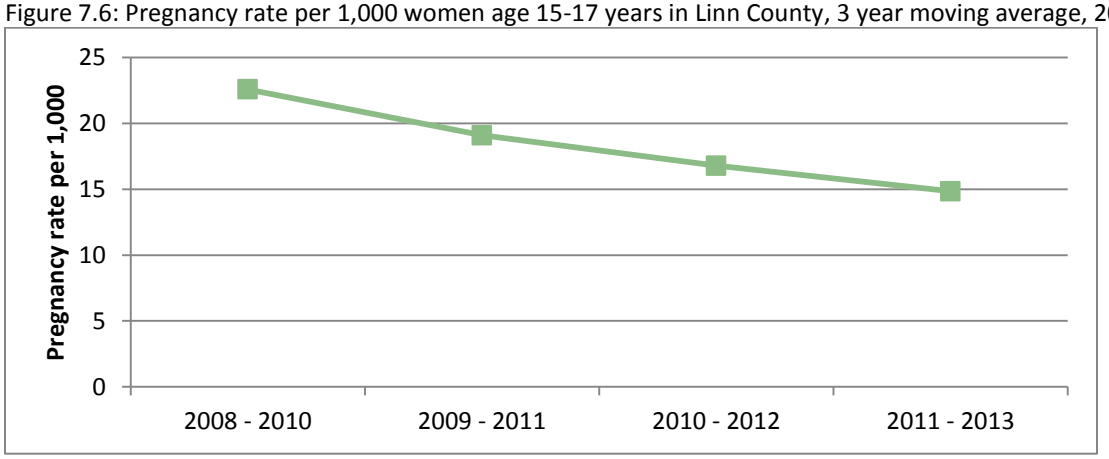
The Pregnancy Risk Assessment Monitoring System (PRAMS), a national surveillance system, provides information about women who have had a recent live birth. Oregon state-level data indicates that 92 percent of pregnant mothers abstained from alcohol during the last 3 months of their pregnancies. Less than one percent had more than one drink per week during the third trimester.[186] There are no Linn County data available at present.

Teen Parenting

Teen mothers are less likely to receive early prenatal care, and are more likely to experience blood-pressure complications and premature birth.[187] Children of teenage mothers are also more likely to become teen parents themselves, be incarcerated during adolescence, drop out of school, experience more health problems, and are two times as likely to experience abuse and neglect. Negative effects of early childbearing on teenage fathers include an increased likelihood of partaking in delinquent behaviors, such as alcohol and drug abuse or dealing, and fewer years of completed school in comparison to their childless peers.[188]

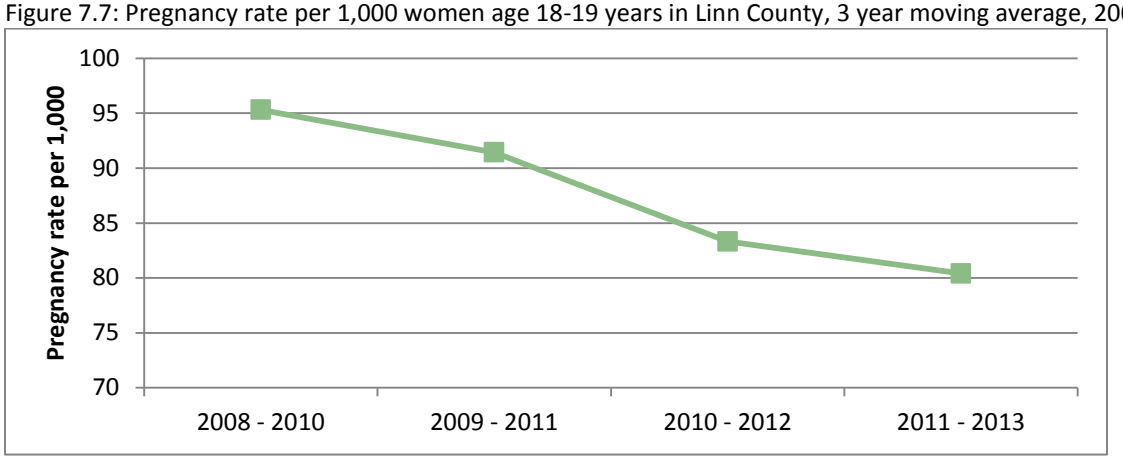
The most recent information available suggests that, overall, Linn County teen pregnancy rates (ages 15 to 17 and 18 to 19) have decreased between 2009 and 2013 (Figures 7.6 and 7.7). Given the small number of teen pregnancies each year, three year averages are shown. The three year average in 2008-2010 among 15-17 year-olds was 22.6 pregnancies per 1,000 women age 15-17. This number declined to 14.8 pregnancies per 1000 women age 15-17 in 2011-2013. This decline is similar among 18-19 year old women; the rate declined from 95.3 pregnancies per 1,000 women age 18-19 in 2008-2010 to 80.4 pregnancies per 1,000 women age 18-19 in 2011-2013. Linn County teen pregnancy rates were below state teen pregnancy rates in 2011-2013 years among 15 to 17 year olds, but were above the state in teen pregnancy rates for all other years.

Figure 7.6: Pregnancy rate per 1,000 women age 15-17 years in Linn County, 3 year moving average, 2008-2013



Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2008-2013

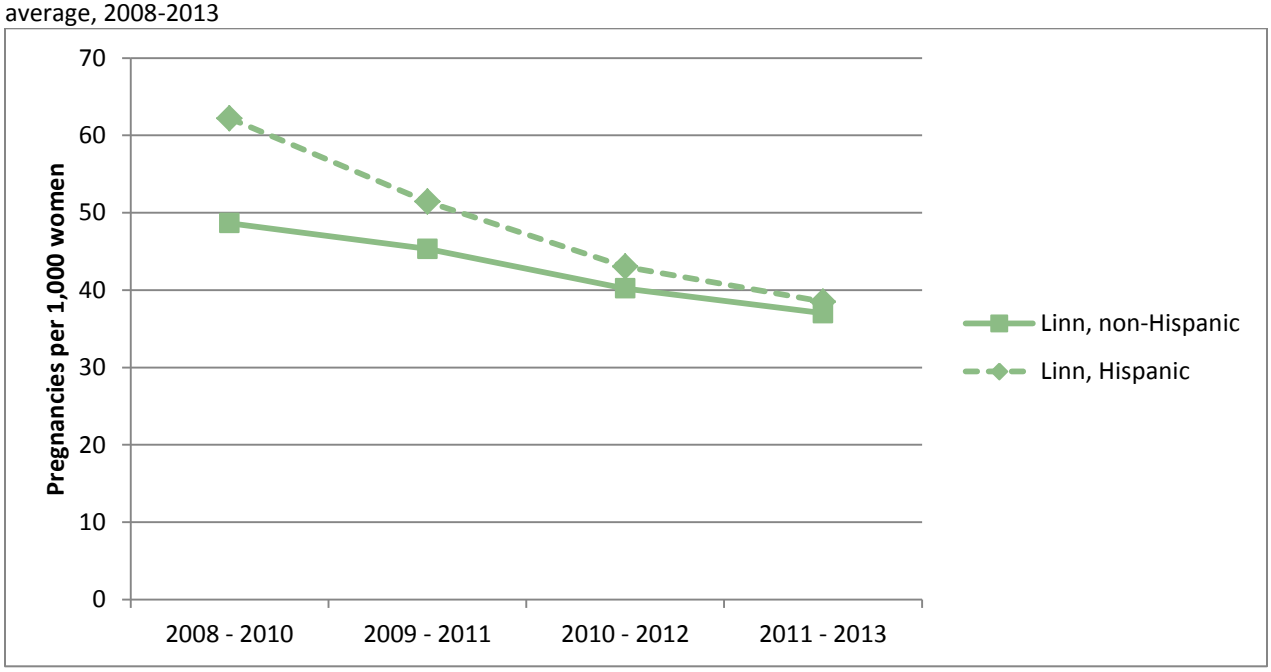
Figure 7.7: Pregnancy rate per 1,000 women age 18-19 years in Linn County, 3 year moving average, 2008-2013



Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2008-2013

Disparities in teen pregnancy rates emerge when the overall Linn County figure is broken down. For example, despite the overall decline in rates, there are striking differences in teen birth rates for Hispanic and non-Hispanic populations. Between 2011 and 2013, Hispanic teens aged 15 to 19 had a pregnancy rate in Linn County that was one percent lower than that of non-Hispanic teens (Figure 7.8). Notwithstanding the greater Hispanic teen pregnancy rates in Linn County, the pregnancy rate among Hispanic teens are declining faster than the pregnancy rate among non-Hispanic teens.

Figure 7.8: Pregnancy rate, Hispanic versus non-Hispanic, women age 15-19 years in Linn County, 3 year moving average, 2008-2013



Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2008-2013

Infant Mortality

The annual infant mortality[6] occurrence in Linn County has been less than 4 per 1,000 births from 2011 to 2013. Infant mortality rates are lower in Linn County (3.98 per 1,000 births) than in Oregon (4.98 per 1,000 births).[189] Linn County has surpassed the Healthy People target of 6.0 per 1,000 births.[190]

Premature Birth and Low Birth Weight

Premature birth, and low birth weight among infants are commonly used measures of maternal and infant health. Infants that are born too early and/or with a low birth weight are at higher risk of dying in the first year of life and of having developmental problems and worse health outcomes throughout life.[191,192] Both conditions are preventable to varying degrees and have been found to be influenced by a variety of factors.

Premature Birth

Premature birth (also known as preterm birth) is a measure of births that occur before the projected full term of the pregnancy. Infants are considered premature when they are born before completing 37 weeks (about 8.5 months) of pregnancy.[193]

In Linn County, the percent of preterm births is 7.9 percent, which is well below the Healthy People 2020 target of 11.4 percent.[194] However, disparities exist among women when stratified by race/ethnicity, as shown below in Table 7.2.

Table 7.2: Percent of births that are premature in Linn County, 2011-2013

	Linn County
White, non-Hispanic	7.9
Black/African American, non-Hispanic	30.4*
American Indian/Alaska Native	4.8*
Asian & Pacific Islander	3.6*
Hispanic/Latino	8.1
All births	7.9

Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2011-2013

** This number may be statistically unreliable due to small numbers and should be interpreted with caution*

Low Birth Weight

Low birth weight results when an infant fails to grow sufficiently during pregnancy and can both signal and cause health problems with the infant. Infants are considered to have low birth weight if they weigh less than 2,500 grams (about 5.5 pounds at birth).

[6] Infant mortality is defined as the death of a live-born infant before the age of 1.

From 2011 to 2013, approximately 6.5 percent of all infants born in Linn County had a low birth weight, which meets the Healthy People 2020 target of 7.8 percent.[195] While Linn County meets the Healthy People 2020 objective for low birth weight infants, differences exist among racial/ethnic groups within the county. Table 7.3 illustrates the variation across different racial/ethnic groups within Linn County.

Table 7.3: Percent of infants born with low birth weight by race/ethnicity in Linn County, 2011-2013

	Linn County
White, NH	6.3%
Black/African American, NH	13.0%*
American Indian/Native American, NH	4.8%*
Asian & Pacific Islander, NH	7.1%*
Hispanic/Latino	7.9%
All infants	6.5%

Source: Oregon Health Authority, Center for Health Statistics, Birth Certificate Data, 2011-2013
** This statistic may be statistically unreliable due to small numbers and should be interpreted with caution*

Breastfeeding

Breastfeeding is associated with numerous health benefits for infants, such as boosting immune system response, reducing the risk of Type 2 diabetes, and preventing obesity. Breastfeeding also promotes maternal-child bonding. The American Academy of Pediatrics recommends exclusively breastfeeding for the first 6 months after birth and further recommends continued breastfeeding for a year or more after birth.[196]

Breastfeeding in Linn County

Data on breastfeeding are limited at both the state and county level. However, state programs, such as the Nutrition and Health Screening Program for Women, Infants, and Children (WIC), give some insight into the percentage of participating women who breastfeed. Table 7.4 displays the available county data on mothers who participate in the WIC program and the rate of breastfeeding. [197]

Table 7.4: Breastfeeding rates among WIC mothers in Linn County, 2014

	Linn County
Percent of pregnant women served by WIC	51%
Percent of WIC mothers who started out breastfeeding (initiation)	91%
Percent of WIC mothers who breastfed exclusively for 6 months	51%

Source: Oregon Health Authority, 2014 WIC Facts

In addition to WIC, most health care providers encourage women to breastfeed their children, and there are many breastfeeding classes and support groups available in Linn County.

Childhood and Adolescence

Childhood and adolescence are formative times in a person's life. The number and severity of adverse experiences during childhood affects an individuals' risk for alcoholism, depression, heart disease, liver disease, intimate partner violence, sexually transmitted infections, smoking, and suicide. Adverse events include emotional, physical, and sexual abuse and neglect, and various types of household dysfunctions such as violence against mothers, substance abuse, mental illness, parental separation or divorce, or an incarcerated household member.[198,199]

Gender Identity and Sexual Orientation

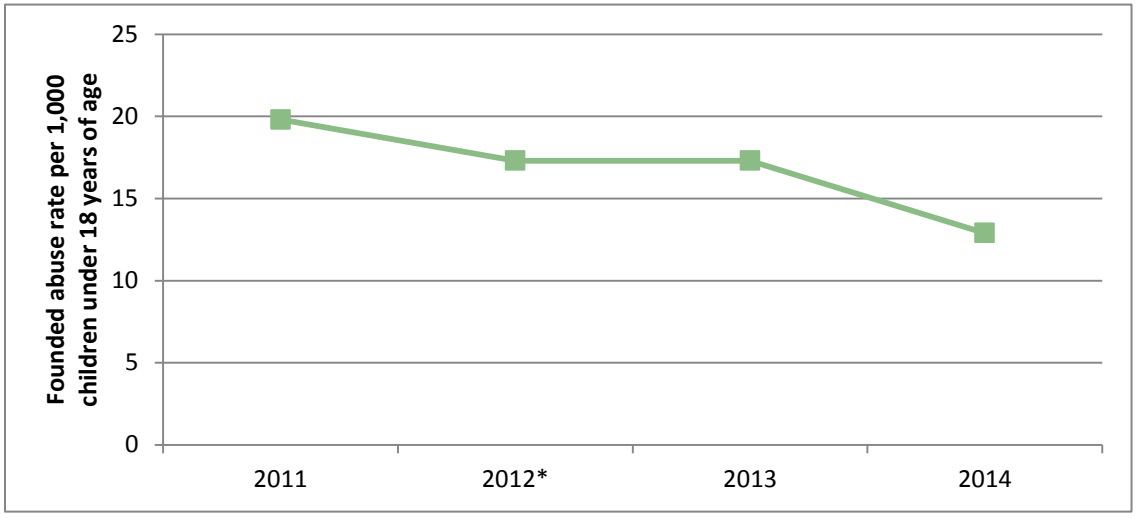
Adolescence is a time of developing sexual awareness and gender expression, although many children are aware of their developing gender identity from a very early age. Because most state and national surveys do not ask questions related to sexual orientation or gender identity, it is difficult to estimate the health needs of lesbian, gay, bisexual, transgender, or queer children, youth and adults in Linn County and Oregon.

Available data include survey responses on harassment among adolescents in our public schools. In Linn County during the 2013-2014 school year, 8th and 11th graders reported having been harassed by a peer who thought they were gay, lesbian, bisexual, or transgender more frequently than 11th graders. Overall, harassment based on perceptions about sexual orientation declines with age.[200,201, 202]

Child Abuse

In 2014, there were a total of 1,157 reports of child abuse/neglect in Linn County, of which 239 (20 percent) were founded (determined to be abuse). There were an additional 493 unfounded reports, and 425 indeterminable reports.[203] The types of abuse/neglect include mental injury, physical/medical neglect, physical abuse, sexual abuse, sexual exploitation, or threat of harm. Most often, the perpetrators of child abuse and neglect are family members (93.9 percent of reports); parents account for 78.2 percent of all perpetrators.[204] In recent years, the rate of child abuse in Linn County has decreased and is similar to the rate in Oregon. [205,206,207,208]

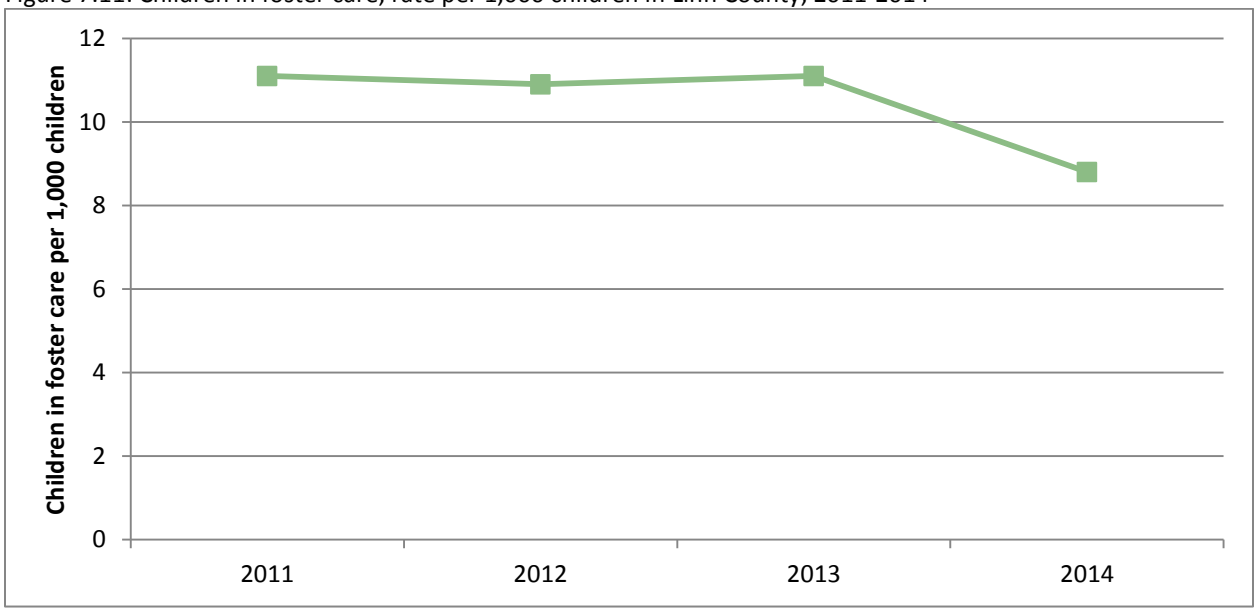
Figure 7.10: Founded abuse rate per 1,000 for children under 18 years of age in Linn County, 2010-2014



Source: Oregon Department of Human Services, Child Welfare Data Book 2011, 2012, 2013, 2014
Rates include neglect, physical abuse, and sexual abuse
**2012 data is from the Portland State University Population Research Center. Starting in 2013, the population data is one year behind the year shown and is from Puzzanchera, C., Sladky, A. and Kang, W. (2014). "Easy Access to Juvenile Populations: 1990-2013."*

Not all reported cases of child abuse result in a foster care placement. Children are placed in foster care for a variety of reasons. Some are placed in foster care because their families cannot provide them with basic safety and protection, while others have had negative experiences such as parental substance abuse, sexual or physical abuse, and abandonment. In Oregon, many children are in foster care due to a history of abuse or neglect.[209]

Figure 7.11: Children in foster care, rate per 1,000 children in Linn County, 2011-2014



Source: Oregon Department of Human Services: Children, Adults and Families Division (2012). Child Welfare Data Book
**State totals do not include Title IV-E eligible children served by tribes.*

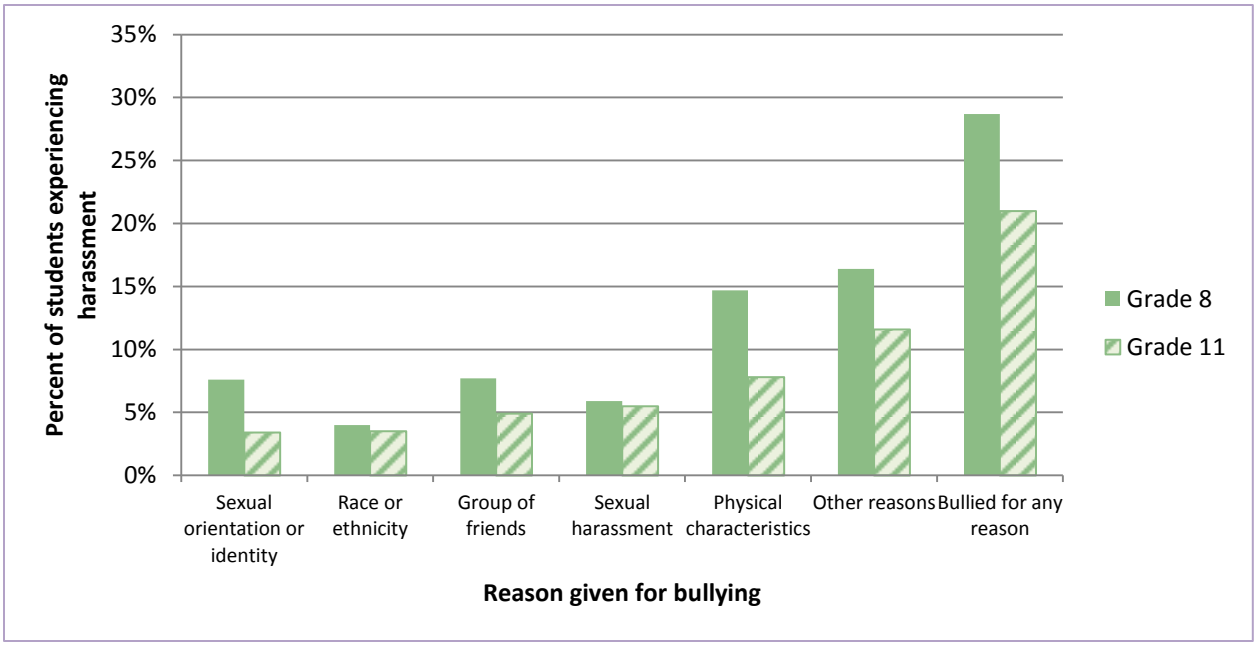
Bullying/Peer Abuse

Violence in schools can affect the learning environment and contribute to absenteeism. Students who are bullied, harassed, and feel unsafe or otherwise victimized, are more likely to miss classes, skip school, feel depressed or exhibit problem behaviors. Research shows that comprehensive discipline, positive behavioral support and anti-bullying programs in schools can reduce the incidence of harassment among primary and secondary school students.[210]

In 2015, seven percent of 8th graders and four percent of 11th graders did not go to school at least once in the past 30 days due to feeling unsafe at school or on their way to school.[211]

Figure 7.12 below shows that reasons for harassment at school differ among age groups at the county level, and that the overall incidence of harassment among Linn County students is common. While the percent of students who report having been harassed at school in the past month tends to decrease with age, reasons for and severity of harassment vary among age groups. Aside from all or other reasons, harassment for physical characteristics is the most reported reason for harassment across all age groups.[212]

Figure 7.12: Percent of students in 8th and 11th grade, who experienced bullying in the past 30 days by reason in Linn County, 2015



Source: Oregon Healthy Teens Survey, 2015

Psychological Distress

Mental health includes our emotional, psychological, and social well-being, and is essential to the overall health and wellbeing of an individual. The World Health Organization defines it as "a state of well-being in which the individual realizes her or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community."[213]

In Oregon, suicide rates are higher than the national average and about 70 percent of people who died by suicide from 2003 to 2012 also had depression. Among all age groups, the suicide rate in 2013 per 100,000 people was 19 in Linn County.[214]

The following table highlights the percentage of 8th and 11th grade students in Linn County and Oregon that exhibited signs of depression, thought about suicide, or attempted suicide during 2015 (Table 7.5). The rate of attempted suicide is higher among 8th graders in Linn County than among 11th graders in Linn County.[215]

Table 7.5: Percent of 8th and 11th grade students that exhibited signs of depression, thoughts about suicide, or actually attempted suicide during the last 12 months, Linn, and Oregon, 2015

	Grade	Linn	Oregon
Felt so sad or hopeless almost every day for two weeks or more in a row that they stopped doing some usual activities	8th	29 %	27 %
	11th	30 %	29 %
Seriously considered attempting suicide	8th	18 %	16 %
	11th	13 %	16 %
Attempted suicide at least once	8th	9 %	8 %
	11th	5 %	6 %

Source: Oregon Healthy Teens Survey, 2015

Physical Activity

Regular physical activity helps improve overall health and wellness, reduces risk for obesity, and lessens the likelihood of developing many chronic diseases including diabetes, cancer, and heart disease. National physical activity guidelines recommend that children engage in at least 60 minutes of physical activity each day, including aerobic, muscle strengthening, and bone strengthening activity.

The Healthy People 2020 objective for physical activity aims to increase the proportion of adolescents who meet current national physical activity guidelines to 32 percent.[216] 33 percent of 8th graders and 25 percent of 11th graders met national guidelines.[217]

Table 7.6 shows that the majority of youth in 8th and 11th grade in Linn County do not spend more than two hours per school day watching television. Among 11th graders, a larger percentage of youth in Linn County spend less than two hours watching television than Oregon youth overall. Linn County surpasses the HP 2020 target for this measure for youth in 11th grade.[218]

Table 7.6: Percent of youth who view television for no more than two hours per school day in Linn County and Oregon, 2015

Grade	Linn County	Oregon
8th Grade	75 %	76 %
11th Grade	77 %	80 %

Source: Oregon Healthy Teens Survey, 2015

Table 7.7 shows that about one-half to two-thirds of 8th and 11th graders in Linn County spend less than 2 hours per day on the computer or on their phone. These rates are comparable to the state average, but fall well short of the Healthy People 2020 target of 82.6 percent.[219]

Table 7.7: Percent of youth who play video/computer games or use a computer for something that is not school work for no more than two hours per school day (including time spent on social networks and on smartphones) in Linn County and Oregon, 2015

Grade	Linn County	Oregon
8th Grade	54 %	54 %
11th Grade	56 %	58 %

Source: Oregon Healthy Teens Survey, 2015

Nutrition

There is a well-established link between eating a healthy and balanced diet, and an increasing number of health benefits. A healthy and balanced diet involves eating a variety of foods which provide essential nutrients (like dietary fiber and potassium), in the right amount – with negative health consequences from consuming too little or too much food.[220] In addition to promoting health, and supporting a healthy weight, mounting evidence links a healthy diet to lowered risks of chronic disease, including several types of cancer, osteoporosis, and cardiovascular disease.[221]

Table 7.8: Percent of youth consuming at least 5 servings of fruits and vegetables per day in Linn County and Oregon, 2015

Grade	Linn County	Oregon
8th Grade	24 %	23 %
11th Grade	19 %	20 %

Source: Oregon Healthy Teens Survey, 2015

Obesity

Being obese or overweight[7] is a complicated health condition. The risk of unhealthy weight is influenced by diet, exercise, and other behaviors, but it also depends strongly on genetic and environmental factors. Obesity is also correlated with socio-economic status and other social determinants of health. In addition to being a poor health outcome, obesity and overweight status can increase the risk of many diseases such as diabetes, heart disease, and possible cancer.

The Oregon Healthy Teens Survey[8] found that more than a quarter of all eighth graders in Linn County are overweight or obese (Table 7.9). Linn County youths are generally less likely to be overweight than Oregon youths, with the exception of 11th graders in Linn County. The rate of obesity and being overweight does not change much between 8th and 11th grade.[222]

Table 7.9: Overweight and obesity prevalence in Linn County and Oregon, 2015

	Linn	Oregon
8th grade overweight	15 %	15 %
8th grade obese	12 %	11 %
11th grade overweight	15 %	15 %
11th grade obese	17 %	13 %

Source: Oregon Healthy Teens Survey, 2015

Oral Health

Another childhood health issue that has ramifications for the rest of a person's life is adequate dental care. Good oral health is essential to overall physical and mental health, and encompasses more than just dental check-ups. Oral disease can lead to cavities and gum ailments, which can in turn contribute to other diseases or conditions. Conversely, certain chronic mental and physical health conditions can also contribute to declines in oral health. Poor oral health can also affect self-esteem, reduce employment opportunities, and increase absenteeism.[223]

[7] Obesity is defined as having a body mass index (BMI) of 30 or more; Overweight is defined as having a BMI of above 25 and less than 30. Healthy weight is a BMI between 20 and 25.

[8] The Oregon Healthy Teens Survey distributes a questionnaire to 8th and 11th graders; therefore, adolescent data is richest for these age groups.

Cavities are almost completely preventable through optimal water fluoridation, application of dental sealants to children's teeth, effective oral hygiene (brushing teeth and flossing), and regular preventive visits to the dentist.[224] The proportion of 8th grade and 11th grade youth who have ever had a cavity is higher than the Healthy People 2020 target of no more than 48.3 percent (Table 7.10). The proportions do not change much in the three years between 8th grade and 11th grade – this indicates that most tooth decay occurs in children before the 8th grade.[225]

Table 7.10: Percent of youth who have ever had a cavity in Linn County and Oregon, 2015

Grade	Linn County	Oregon
8th Grade	73 %	69 %
11th Grade	73 %	75 %

Source: Oregon Healthy Teens Survey, 2015

Achieving and maintaining good oral health is a significant challenge for many people in Linn County, particularly those with lower incomes. This challenge may be exacerbated by the fact that not all cities, districts, or water supplies in Linn County are fluoridated (see Chapter 3: Environment).

One of the objectives of Healthy People 2020 is to increase the proportion of U.S. communities with fluoridated water to 75 percent.[226] Linn County surpasses this percentage (at 82 percent).[227] Approximately 27 percent of Oregon residents have access to fluoridation through community water systems, the second lowest percentage in the country.[228]

Alcohol, Tobacco, and Prescription and Illicit Drug Abuse

Alcohol and prescription medications are consumed appropriately and responsibly by most of the population. However problems frequently occur when these substances are over-consumed, used inappropriately, combined with other substances, or consumed while engaging in risky activities such as driving or unsafe sexual activity. The costs to society of the misuse of alcohol, prescription medications and other drugs are massive, and include injury and death due to overdose; effects on unborn children of drug users; impacts on family, crime and homelessness; spread of infectious disease including through sexual transmission and needle sharing; and financial costs associated with lost productivity, healthcare, and legal expenses for individuals and the wider community.[229]

Table 7.11: Percent of youth who reported taking part in illicit activities in the past 30 days in Linn County and Oregon, 2015

	Grade	Linn	Oregon
Consumed at least one alcoholic beverage	8th	14 %	12 %
	11th	29 %	30 %
Consumed at least 5 alcoholic beverages within a couple of hours	8th	8 %	5 %
	11th	18 %	17 %
Smoked cigarettes	8th	8 %	4 %
	11th	11 %	9 %
Used e-cigarettes	8th	14 %	9 %
	11th	21 %	17 %
Used marijuana	8th	12 %	9 %
	11th	22 %	19 %
Used prescription drugs without a doctor's orders	8th	7 %	4 %
	11th	8 %	7 %

Source: Oregon Healthy Teens Survey, 2015

Alcohol Use

The younger a person begins drinking regularly, the greater the chance that person will develop a clinically defined alcohol disorder. Youth who start drinking before the age 15, compared to those who start at 21, are far more likely to be injured while under the influence of alcohol, to be in a motor vehicle crash after drinking, or to become involved in a physical fight after drinking.[230] Overall, alcohol use among Linn County youth tends to increase with age, reflecting the state trend displayed in Table 7.11.

Binge Drinking

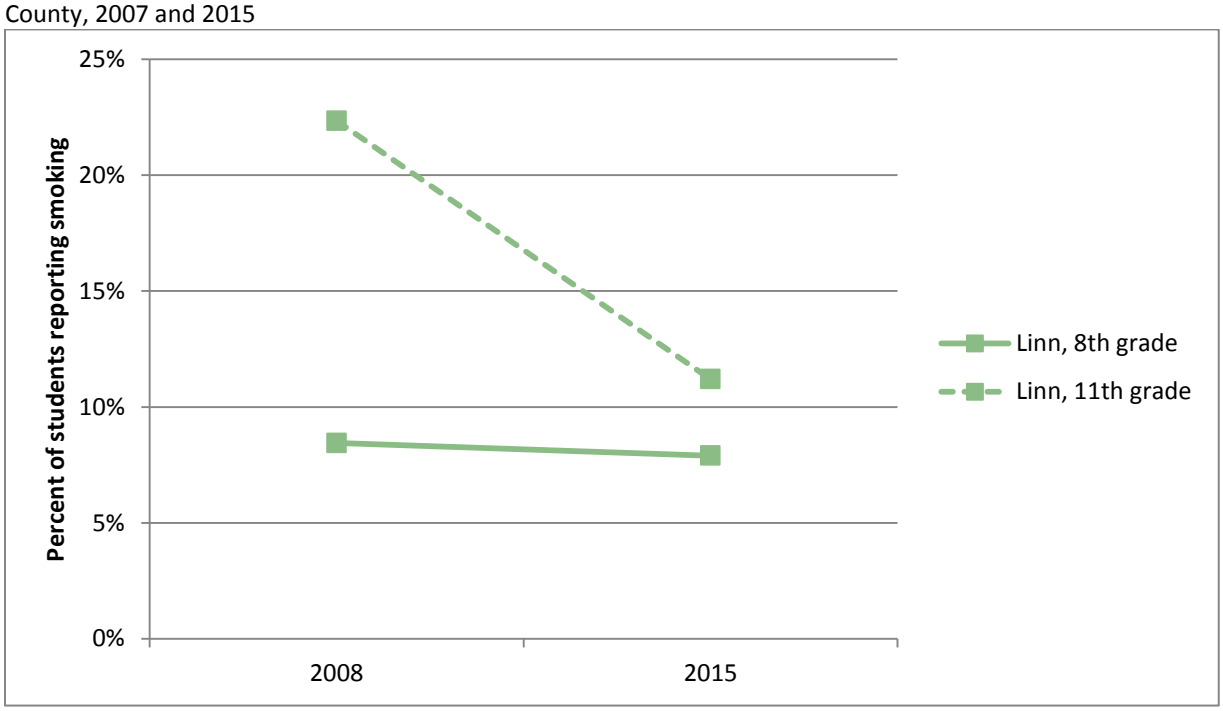
Middle and high school youth in Linn County and Oregon report binge drinking at similar rates. Approximately 8 percent of Linn County 8th graders reported binge drinking in 2015 (Table 7.11,

above). This rate increased to 18 percent among 11th graders.[231] Linn County likely meets the Healthy People 2020 objective of reducing the percent of high school seniors (12th graders) who binge drink to below 23 percent, but it is not possible to directly compare the rates between 11th graders and 12th graders.[232]

Tobacco Use among Adolescents

Tobacco products are designed to deliver nicotine, an addictive drug that changes the way the brain works, causing tobacco users to crave repeated doses. Youth are especially sensitive to nicotine and can become dependent more quickly than adults. Because of their dependency, nearly three out of four teen smokers continue using tobacco products into adulthood.[233] Tobacco use is present among Linn County youth but has been decreasing over time. Figure 7.13 below illustrates this trend, in addition to showing that smoking among youth increases with age.[234,235]

Figure 7.13: Percent of students that reported having smoked cigarettes at least once in the past 30 days, Linn County, 2007 and 2015



Source: Oregon Healthy Teens Survey, 2007 and 2015

2015 was the first year the Oregon Healthy Teens Survey asked students about electronic cigarette use. Among both 8th and 11th graders, electronic cigarette use was significantly higher than smoking cigarettes. The rate of electronic cigarette use among 8th graders was nearly twice that of cigarette smoking (14 percent versus 8 percent), as was the rate among 11th graders (20 percent versus 11 percent).

Marijuana, Prescription Drug, and Illicit Drug Use

Recreational marijuana is still illegal for all individuals under 21 years of age. The effects of marijuana on children and adults have not been studied to the degree that other legal substances have been, including alcohol and cigarettes. Another major public health concern is the abuse of prescription drugs. When these drugs are misused or taken without a doctor's prescription they can be just as harmful as illegal street drugs.

Among youths in Linn County, marijuana use was generally more than twice as prevalent as cigarette smoking as shown in Table 7.11. Marijuana use increased from 8th grade to 11th grade. In Linn County, one out of every five 11th graders surveyed reported using marijuana in the past 30 days. Adolescents in Linn County abuse prescription drugs at rates higher than the state.[236] There are no reliable data on other illicit drug use among adolescents in the county.

Many healthy behaviors that children learn continue to support their health as adults, including good oral hygiene, exercise and nutritious diets, and abstaining from drugs or tobacco. The next section discusses the prevalence of these behaviors among adults in Linn County.

Adults

As individuals enter adulthood, they become independent in their decision making. With adulthood comes a new set of stressors and risks, such as the potential for partner violence or easier access to alcohol, tobacco, and drugs. At the same time, working adults have more independence and resources to engage in healthy behaviors such as consuming nutritious food and getting adequate exercise.

Many of the topics that were covered in the childhood health section are revisited here, and some additional areas are introduced. Much of the data reported in this section covers adults from age 18 onward.

Domestic Violence

Domestic violence, which includes many forms of abuse, affects children and adults. Physical abuse, sexual abuse or assault, intimidation, verbal abuse and emotional abuse, or threats of such harm are all forms of domestic violence. Domestic violence can include abuse from a household member (including roommates or caregivers), intimate partners (including dating partners) or a family member (whether or not they live with the victim).[237]

The Center Against Rape and Domestic Violence (CARDV) is a non-profit organization serving Linn and Benton Counties that provides supportive services to victims of domestic violence, sexual assault, and dating abuse.[238] Services include crisis intervention, emergency shelter, 24-hour crisis line, safety planning, advocacy, court information and support, agency and resource referrals, education, peer counseling, and outreach activities.

CARDV responded to a total 7,178 calls on its 24-hour crisis line and provided emergency shelter to 125 adults and 91 children for a total of 3,240 bed nights. CARDV also provided legal system support to 594 adults and 11 teens from Benton and Linn Counties.[239]

Domestic violence not only has an effect on the victim, but can also have an effect on children; domestic violence poses a threat to children's emotional, psychological, and physical well-being. Children who live with domestic violence are also at an increased risk to become direct victims of child abuse.[240]

Abuse of Vulnerable Adults

Vulnerable adults include the elderly and adults of all ages with physical or mental disabilities, whether living at home or being cared for in a health facility. Abuse and maltreatment of vulnerable adults can include physical, emotional, or sexual abuse, caregiver neglect, and financial exploitation. The information in this section includes adults and seniors.

In Linn County there were 32 allegations of abuse against adults with an intellectual and/or developmental disability in 2014; 20 of these were substantiated.

Mental and Emotional Health

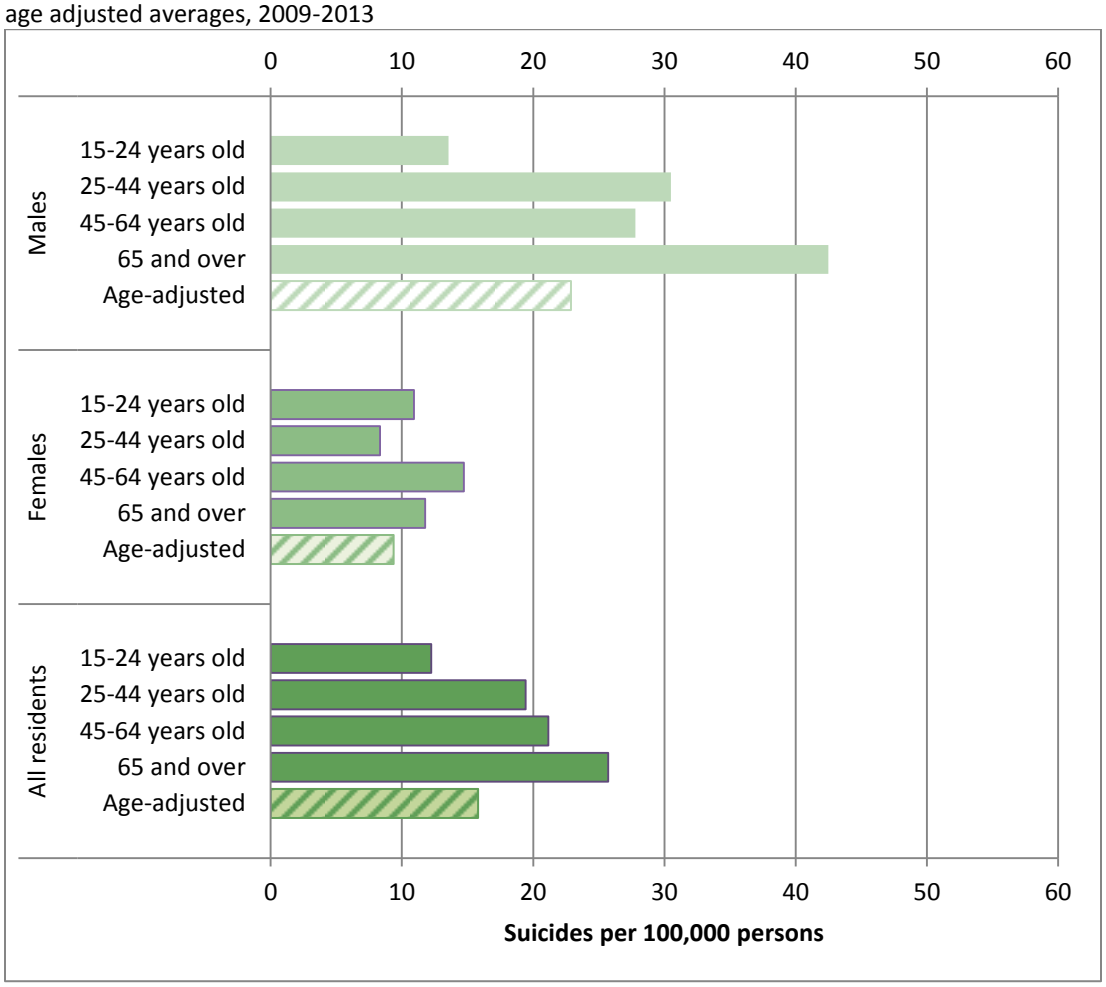
Mental and emotional health begins in childhood and extends throughout a person's life. Many mental disorders manifest during the transition from adolescence to adulthood, including depression, schizophrenia, and bipolar disorder.

A major depressive episode (MDE) is defined as a period of at least two weeks when a person experienced a depressed mood or a loss of interest or pleasure in daily activities. In addition to this, four of the seven symptoms reflecting the criteria for major depressive disorder (as described in the 4th edition of the DSM-IV) must have been experienced by the individual.[241] From 2008 to 2010, eight percent of Linn County adults age 18 years and older reported having had a MDE in the past year.[242,243] This is comparable to seven percent of Oregon adults aged 18 years and older having reported an MDE in the past year.[244]

The most serious consequence of poor mental health is suicide. Overall, the suicide rate among Oregon adult males is 3.7 times the rate among adult females. This is a larger ratio than in Linn County, where the suicide rate among men is 2.4 times the rate among women.[245] The total suicide rate increases with age, but this is due primarily to the outsize effect of male suicide rates, which increase with age. Among males of all age groups in Linn County from 2009 to 2012, males over the age of 65 had the highest suicide rate at 43 per 100,000 men (Figure 7.14). After the age of 70, the rate of suicide among older adult men rises dramatically (up to 72 per 100,000 men for males 85 and older in the state of Oregon).[246] Females had a much lower rate of suicide, averaging 9 per 100,000 women, and this rate does not increase with

increasing age. The suicide rate among women peaks at 15 per 100,000 women between the ages of 45 and 64.[247]

Figure 7.14: Suicide rates per 100,000 men, per 100,000 women, and per 100,000 individuals, with Linn County age adjusted averages, 2009-2013



Source: Oregon Health Authority, Oregon Public Health Assessment Tool, 2009-2013

Physical activity

Physical activity is important for maintaining health as a person ages. Recommendations for adults include at least an hour and fifteen minutes of vigorous-intensity activity or two-and-a-half hours of moderate-intensity activity every week, in addition to muscle-strengthening activities on two or more days a week.[248]

Overall, 22 percent of adults in Linn County met the CDC guidelines for physical activity[9] from 2010-2013, compared to 25 percent of adults in Oregon.[249]

[9] The CDC recommends 30 minutes of moderate physical activity on five or more days per week.

Of greater concern is the proportion of the population that gets little to no exercise. In Linn County, 22 percent of adults report no physical activity outside of work, compared to the Oregon average of 18 percent.[250]

At the state level, participation in physical activity varies by race/ethnicity, household income, and by level of education. Adults with less than a high school education, those earning less than $24,999, and Latinos are less likely to meet CDC physical activity recommendations than their peers.[251] As with children and youth, county-level data that describe physical activity levels among adults by race/ethnicity or level of household income are not available.

Nutrition and eating habits are frequently set early in life. Good nutrition can delay the physical signs of aging and prevent or slow the development of many chronic diseases, including diabetes and cancer. Approximately one in five adults in Linn County and in Oregon consumes at least 5 servings of fruits and vegetables per day.[252]

Obesity

Obesity is a complicated health issue, with many factors that affect the likelihood of obesity, and many downstream health issues that are influenced by body weight.

While about 30 percent of children in Linn County are overweight or obese, the prevalence of overweight or obesity more than doubles among adults. An estimated 25 percent of adults in Linn County are obese; an additional 36 percent are overweight.[253] Therefore, about 61 percent of Linn County adults are either overweight or obese.

Alcohol, Tobacco, and Drug Use

Data shows that younger adults (particularly in their 20's) are at a higher risk for misuse of alcohol and other drugs. One particular area for concern is the misuse of prescription drugs. Misuse of these drugs is highest among young adults (aged 18 to 25).[254] As the most commonly abused type of prescription drugs, painkillers provide a useful marker for prescription drug misuse trends. While data shows little change in the self-reported pain experienced by Americans, the amount of painkillers dispensed in the U.S. has quadrupled since 1999, as have the deaths resulting from prescription painkillers.

Of particular concern is the rate of misuse of prescription painkillers among Medicaid patients. Research shows higher rates of inappropriate provider prescribing practices and patient use as compared to privately insured patients. Potential inappropriate prescribing practices include overlapping prescriptions for painkillers, high daily doses, or long-acting painkillers, and have been shown in at least one study to be present in particularly high rates amongst Medicaid enrollees.[255]

Alcohol Use

Excessive drinking is a risk factor for many adverse health outcomes, such as hypertension, alcohol poisoning, unintended pregnancy, fetal alcohol syndrome, inter-personal violence, and motor vehicle crashes.[256] It can also contribute to a number of health issues including heart disease and stroke, high blood pressure, cirrhosis, coma, and even death.[257] The following data includes adults ages 18 and older.

Excessive drinking is defined differently for men and women, due to different metabolic rates and average body weights. Among men, excessive drinking is defined as 2 or more alcoholic drinks per day for a period of 30 days. In Linn County, five percent of men reported excessive drinking (Table 7.12).

For women, excessive drinking is defined as one or more alcoholic drinks per day for a period of 30 days. In general, excessive drinking among women is lower in Linn County than among men (Table 7.12).

Table 7.12: Alcohol abuse among adults, 18 years and older in Linn County, and Oregon, 2010-2013

	Gender	Linn	Oregon
Consumed at least two alcoholic beverages per day for the past 30 days	Male	5 %	6 %
Consumed at least one alcoholic beverage per day for the past 30 days	Female	4 %	7 %
Consumed at least 5 (male) or 4 (female) alcoholic beverages within a couple of hours in the past 30 days		22 %	18 %

Source: Oregon BRFSS 2010-2013

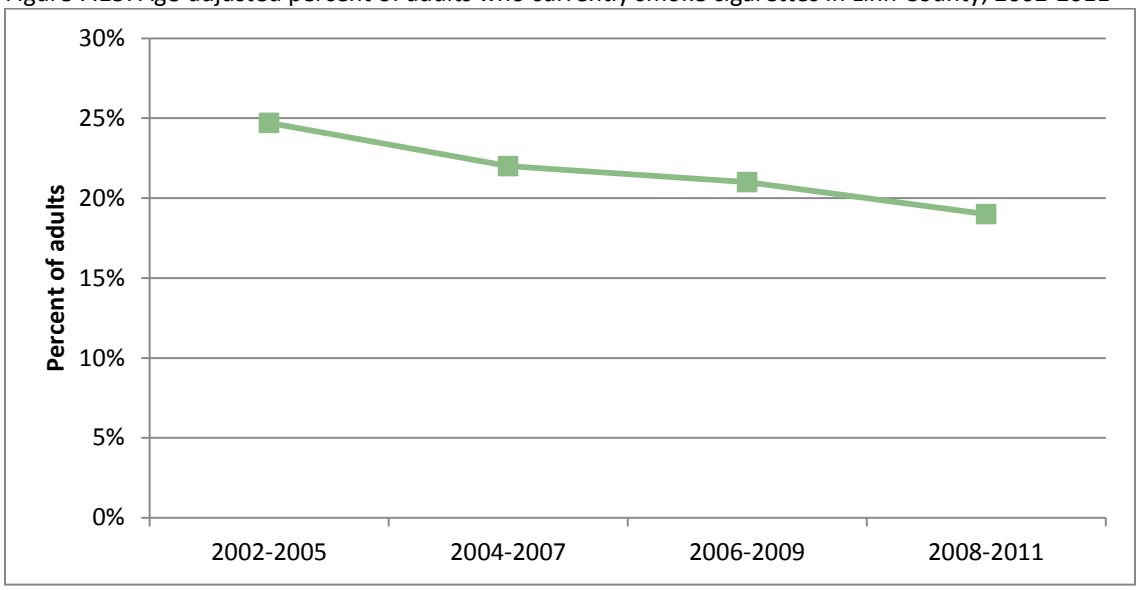
Binge Drinking among Adults

For adults over the age of 18, binge drinking is defined as consuming five or more drinks at one time for men and four or more drinks at one time for women.[258] Binge drinking is more common across Linn County and in the state than drinking every day. Twenty-two percent of Linn County adults reported binge drinking within the past month in 2013 (Table 7.13).[259] Linn County meets and surpasses the Healthy People 2020 objective of reducing the percent of adults that reported having engaged in binge drinking within the past month to 24.4 percent.[260]

Tobacco Use and Exposure to Secondhand Smoke

Tobacco use is the single most preventable cause of disease, disability, and death in the United States. Tobacco use in any form can cause serious diseases and health problems, including cancers of the lung, bladder, kidney, pancreas, mouth, and throat, heart disease and stroke, lung diseases (i.e., emphysema, bronchitis, and chronic obstructive pulmonary disease), pregnancy complications, gum disease and vision problems.[261]

Figure 7.15: Age-adjusted percent of adults who currently smoke cigarettes in Linn County, 2002-2011



Source: Oregon BRFSS, Table II: Prevalence of Modifiable Risk Factors among Adults, 2002-2011

More recent data has been collected that includes up to 2013, but should not be compared to the data in Figure 7.15 above due to changes in survey methodology. The 2010-2013 data is presented in Table 7.13 below, and is likely more accurate due to a more representative survey sample. These data indicate that Linn County is not meeting the Healthy People 2020 smoking target of 12 percent or below.

Table 7.13: Age-adjusted percent of adults who currently smoke cigarettes in Linn County and Oregon, 2010-2013

	Linn County	Oregon
Smoking rates	21 %	19 %

Source: Oregon BRFSS, Table II: Prevalence of Modifiable Risk Factors among Adults, 2010-2013

Secondhand Smoke Exposure

Secondhand smoke is a mixture of the smoke exhaled by a person smoking, and the smoke from burning tobacco in a cigarette, pipe, or cigar. Secondhand smoke contains the same toxic chemicals and carcinogens as inhaled tobacco smoke, and even brief exposure has been found to put a nonsmoker's health at risk. In adults, secondhand smoke exposure has been found to cause lung cancer and heart disease. Children exposed to secondhand smoke are more at risk for ear infections, asthma attacks, respiratory symptoms and infections, and a greater risk for sudden infant death syndrome (SIDS).[262] Measures to reduce the amount of secondhand smoke exposure to others include, but are not limited to, quitting smoking, forbidding smoking in the home, and forbidding smoking in a shared car. Table 7.14 illustrates that the majority of

households in Linn County have rules against smoking in the home, while a smaller majority hold the same rules against smoking in family cars.

Table 7.14: Family tobacco/secondhand smoke practices (age-adjusted) in Linn County and Oregon, 2008-2011

	Linn County	Oregon
Have rules against smoking in the home	93 %	91 %
Have rules against smoking in family cars	85 %	82 %

Source: Oregon Health Authority, Table IV: Age-adjusted and unadjusted prevalence of tobacco use among adults, 2008-2011

Older Adult Health

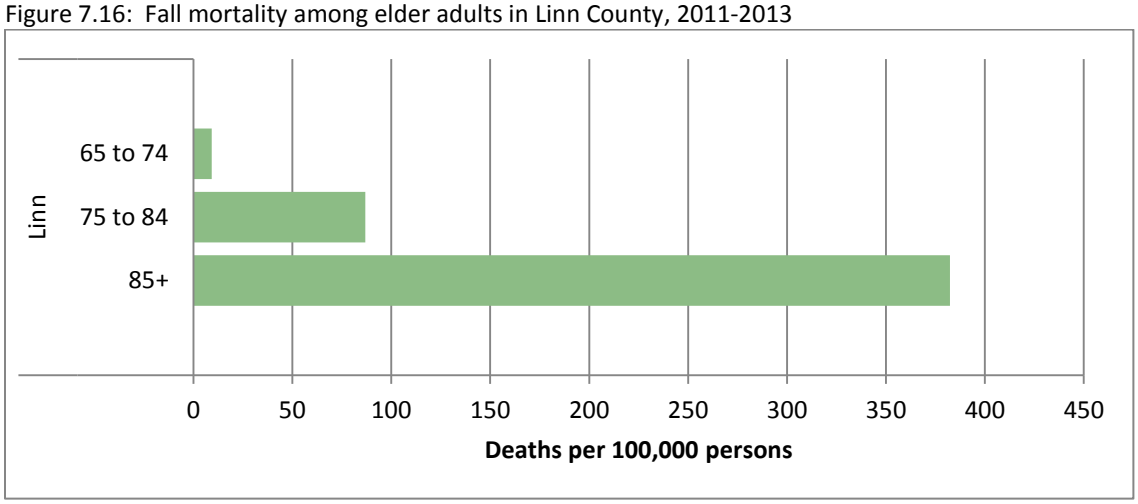
As people age, many of the behaviors they have adopted over their lives begin to pay dividends, whether it is exercising regularly, eating healthy food, or avoiding drugs and tobacco. Older adults also encounter a different set of challenges for staying healthy. This section revisits some of the ongoing behaviors and also highlights new factors that affect health.

Preventing Falls

Falls are a major cause of injury and hospitalization, and the 10th leading cause of death among older Oregonians.[263] Nearly one in three older adults experiences a fall each year, and 20-30 percent of those who fall suffer injuries. As commonly as they occur, injuries and deaths due to falls are not an inevitable consequence of aging; they can be prevented. Muscle weakness is a significant contributing factor in falls, so physical activity is widely viewed as among the most important interventions for preventing injuries related to falls among older adults.

Hospitalization rates for falls increase drastically as adults age; the rate of hospitalizations due to a fall for adults 75 years and older is more than six times the rate for adults 60-74 years. Older adults hospitalized for falls are nearly six times more likely to be discharged into long term care compared to older adults hospitalized for other conditions. In 2013, the cost for fall injury hospitalization among adults 65 years and older in Oregon totaled to more than $219 million.[264] Between 2011 and 2013, the mortality rate from falls in Linn County was 82 deaths per 100,000 residents age 65 and older. Figure 7.16 below highlights the difference in mortality rates for different age groups among the elderly in Linn County.

Figure 7.16: Fall mortality among elder adults in Linn County, 2011-2013



Source: Oregon Health Authority, Oregon Public Health Assessment Tool, 2011-2013

Depression and suicide

Linn County suicide rates are also higher among older adults, with 26 suicides per 100,000 adults age 65 and older between 2009 and 2013. This rate is 50 percent higher than the age adjusted rate for all Linn County residents. This increased rate conceals the difference between older men and women, however. The suicide rate among older men was 20 percent higher than among all men. The suicide rate among older women was 3 percent higher than among all women, and was lower than the suicide rate among women age 45-64. See Figure 7.14 in the Adults Mental and Emotional Health section for a visual representation of these data.

Conclusion

There were a number of promising changes in behavioral indicators over the past triennium. Prenatal smoking rates declined from 20 percent to 17 percent, 11th grade smoking rates declined from 23 percent to 11 percent, and smoking rates continued to decline among all adults. However, 21 percent of 11 graders reported using e-cigarettes, in the first year that these data were recorded. Binge drinking among 11th graders decreased from 26 percent in 2010 to 18 percent in 2015. 19 percent of Linn County residents eat at least five servings of fruits or vegetables per day, up from 15 percent in the previous triennium.

The life course framework helps us recognize two key components of community health: the health issues which are most important at particular stages of life, and when they are best addressed. At the same time, we are able to identify particular disparities that are present throughout the life course, such as the far-reaching risks of poor health tied to low birth weight. In this context, differences in low birth weight that exist by race in Linn County, as well as differences in related behaviors, like smoking among pregnant women, become particularly important for health improvement efforts.

As we gather more data on the health behaviors and practices discussed in this chapter, we will be able to make distinctions between such factors as race/ethnicity, age, and income status. Such data would enable us to focus prevention efforts at the age and sub-population level at which they are most needed in Linn County, resulting in countless health benefits throughout the life course.

Conclusion
Meeting Challenges with Resources

As highlighted throughout the Community Health Needs Assessment, there are many factors that influence and affect health outcomes, both positively and negatively, in west Linn County. The CHNA provides an opportunity to identify the many health concerns, disparities and impacts that residents face in their daily lives.

A health assessment is truly important to help identify needs and opportunities for improvement. At the same time, it is important to highlight the various resources and assets that are alive and well within our communities. These resources and assets refer to the many types of human, social and economic resources that West Linn County can offer to address problems. Organizations, agencies and partners within and across the three counties can collaborate to improve the health and quality of life for residents.

General Health Status

In 2016, Linn County was ranked 22 out of 36 counties for health outcomes, and 26 out of 36 for health factors.[265] It is clear in these numbers that Linn County has a lot of opportunity ahead to work on improving overall health status for the residents who live here. The County Health Rankings look at the different factors and conditions that affect the health and well-bring of county residents, and are made up of four categories: health behavior, clinical care, social and economic factors, and physical environment.

In the 2016 County Health Rankings report, Linn County had strengths in its primary care physician ratio, the proportion of residents who had attended college, and clean air. [266]

Knowledge and Skills in Caring for and Promoting Health

West Linn County is part of a three-county region that shares a long history of collaboration and partnership among various organizations and agencies to improve and promote health.

- Samaritan Albany General Hospital and Samaritan Health Services work tirelessly to improve the health of the people of west Linn County by providing excellent health care and supporting social programs.
- Linn County's Tobacco Prevention & Education Program aims to reduce tobacco-related illness and death. There also exist other population-based prevention and chronic disease programs that reduce the onset and incidence of many chronic conditions and help residents take control of their health.

- Linn County is home to a variety of medical care, dental care, vision care, elder care, medical clinics, doctors, nurse practitioners, and alternative medicine which can be expanded upon to meet the needs of all residents.

Social Support Networks

- Linn County has a comprehensive network of social support and opportunity for the aging population.
- The county offers specialized support for people with mental illness, addictions, disabilities, and children with behavioral or emotional problems.
- The county has a strong commitment to the health and wellbeing of children and youth. This commitment includes a focus on issues such as increasing family stability, kindergarten readiness, and equitable service coordination. Numerous organizations exist to address education, nutrition, and social support for children and families.
- The Albany Partnership for Housing and Community Development has supportive housing services, so that stable housing and case management is the first step forward to ending homelessness.
- Community Services Consortium serves as the community action agency supporting the most vulnerable populations in the county.

Without being able to call out every organization and project that supports the health of west Linn County, what is shown above only highlights a few examples; each example is the result of efforts by countless community partners. A wealth of collective action and resources exists within Linn County. Overcoming the many health challenges facing residents depends on this collective action and the vitally important part that each of our community partners play.

Resources

- Linn County has an excellent basic framework to assist homeless persons (i.e. emergency shelter, transitional housing, and permanent affordable housing).
- The county is particularly strong in offering a wide choice in public schools, private schools, and alternative schooling opportunities.
- The county has several service providers which provide adult education (i.e. literacy, GED and parenting courses).
- The county is particularly strong in offering job seeking services, vocational training, and general support for unemployed persons.
- The county maintains safe, well-marked roads and bike lanes that help prevent traffic injuries and chronic disease.
- The county has a history of collaboration among various sectors to promote many successful and progressive transportation and built environment programs (i.e. Alternative mode options, Dial-A-Bus, PDX transit, Safety sidewalk and ramp program, Public Transit).

Evaluation of Impact

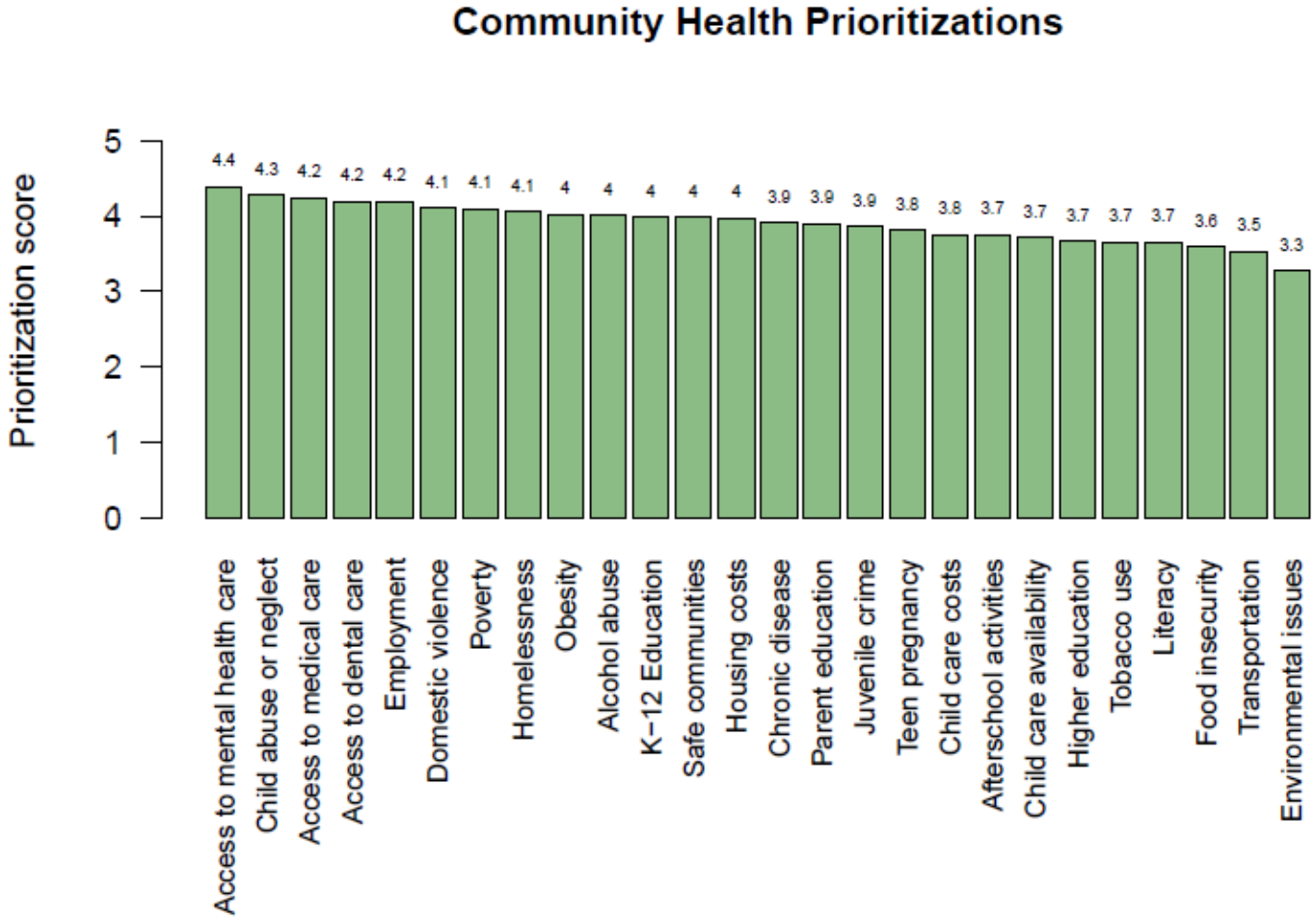
Samaritan Albany General Hospital has provided services and supports to address the health needs prioritized in the previous community health needs assessment completed in 2013. Through both internal and external activities focused on the nine community benefit areas, SAGH utilizes a process evaluation method to determine community impact. The most significant health needs identified in the prior community health needs assessment included obesity, access to health care, substance abuse, poverty, chronic disease, mental health, alcohol abuse and tobacco use.

A variety of actions were taken to address the identified needs, such as the offering health fairs, workshops and classes to the community that addressed obesity, chronic disease, substance abuse and tobacco use. Since 2013 over 16,000 residents participated in one or more of the aforementioned events. To address the access to health care, SAGH has provided transportation, interpretative services, increased medical office hours, expanded urgent care site hours and offered screenings, exams and complete physicals in local schools, Boys & Girls Clubs and in Senior Centers. During this same timeframe over 15,000 residents were transported to a medical appointment and over 5,100 were screened or examined. More detailed information on activities that support the priorities are contained in the 2013, 2014 and 2015 Community Benefit Plans. SAGH also provided over 2 million dollars to non-profit organization through direct financial support or in-kind contributions.

Community priorities

Samaritan Albany General Hospital reached out to community members through a series of key informant interviews, focus groups, and surveys to learn about the health priorities of the community. Full results are presented in the appendix to this document. A summary of the survey results is shown on the following page. Community members were asked to rate 26 health priorities on a scale of 1 to 5, where 1 is lowest priority and 5 is highest priority. The results were averaged for each of the 26 categories.

Figure 8.1: Community Health Prioritizations



A total of **1,228** respondents from Linn County answered the question: "For the following issues that affect health, please circle how much attention you think they should get in our communities on a scale of 1 to 5" from the Community Health Perceptions Survey**.** Responses are reported as mean values. Of those that responded, the top five issues were identifed as: "Access to mental health care" with a mean value of **4.4**; "Child abuse or neglect" with a mean value of **4.3**; "Access to medical care" with a mean value of **4.2**; "Access to dental care" with a mean value of **4.2**; and lastly "Employment" with a mean value of **4.2**".

[1] World Health Organization (WHO). (1985). Constitution of the World Health Organization. Retrieved from http://www.who.int/about/definition/en/print.html

[2] Oregon Health Authority, Office for Oregon Health Policy and Research. (2011). Research Brief: Health Equity. Retrieved from http://www.oregon.gov/oha/oei/docs/health-equity-brief.pdf

[3] Oregon Health Authority, Public Health Division. (2010). The Burden of Asthma in Oregon: 2010. Retrieved from http://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Asthma/Documents/burden/or_asthma2010.pdf

[4] Oregon Health Authority, Public Health Division. (2012). Oregon overweight, obesity, physical activity and nutrition facts. Retrieved from http://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Documents/Oregon_PANfactst_2012.pdf

[5] Hillemeier, M., Lynch, J., Harper, S., & Casper, M. (2004). Data Set Directory of Social Determinants of Health at the Local Level [data set]. Retrieved from http://www.cdc.gov/dhdsp/docs/data_set_directory.pdf

[6] King County. (2012). Equity and social justice annual report. Retrieved from www.kingcounty.gov/equity

[7] Minnesota Department of Health and Healthy Minnesota Partnership. (2012). The Health of Minnesota: Statewide Health Assessment. Retrieved from www.health.state.mn.us/healthymnpartnership

[8] Public Broadcasting Service. (2008). Unnatural Causes: is inequality making us sick? Retrieved from http://www.unnaturalcauses.org/assets/uploads/file/AmazingFacts_small.pdf

[9] Oregon Health Authority. (2013). 10-Year Plan for Oregon Project: Healthy People Policy Vision. Retrieved from http://www.oregon.gov/COO/Ten/docs/PeopleOutcome.pdf

[10] US Census Bureau (2011) State and County Quick Facts: Linn County, OR. Retrieved from http://quickfacts.census.gov/qfd/states/41/41043.html

[11] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[12] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[13] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[14] U.S. Census Bureau. (2013). Veteran Status, American Community Survey 5-year estimates, 2009-2013, Table S2101. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S2101&prodType=table

[15] U.S. Census Quick Facts. (2011). State & County QuickFacts: Veterans. Retrieved from http://quickfacts.census.gov/qfd/meta/long_VET605211.htm

[16] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[17] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[18] U.S. Census Bureau. (2000). Total Population, Universe: Total population, Census 2000 Summary File 1 (SF 1) 100-percent data, Table P001. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_P1&prodType=table

[19] Centers for Disease Control and Prevention, Minority Health. (2012). Definitions. Retrieved from http://www.cdc.gov/minorityhealth/populations/REMP/definitions.html#Def

[20] U.S. Census Bureau. (2013). Selected Social Characteristics in the United States, American Community Survey 3-Year estimates, 2011-2013, Table DP02. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP02&prodType=table

[21] Pew Research Latino Center (2014). Linn County, Oregon. Retrieved from http://www.pewhispanic.org/states/county/41043/

[22] Pew Research Latino Center (2014). Benton County, Oregon. Retrieved from http://www.pewhispanic.org/states/county/41003/

[23] Pew Research Latino Center (2014). Lincoln County, Oregon. Retrieved from http://www.pewhispanic.org/states/county/41041/

[24] Oregon Department of Education. (n.d.). Student Ethnicity statistics, academic year 2013-2014. Retrieved from http://www.ode.state.or.us/sfda/reports/r0067Select.asp

[25] U.S. Equal Employment Opportunity Commission, U.S. Department of Justice Civil Rights Division. (2008). Americans with Disabilities Act: Questions and Answers. Retrieved from http://www.ada.gov/qandaeng.htm

[26] Watson, A., Hanrahan, P., Luchins, D., Lurigio, A. (2001). Mental Health Courts and the Complex Issue of Mentally Ill Offenders. *Psychiatric Services, 52*(4), 477-481. Retrieved from http://dx.doi.org/10.1176/appi.ps.52.4.477

[27] U.S. Census Bureau. (2013). Disability Characteristics, American Community Survey 5-Year estimates, 2009-2013, Table S1810. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S1810&prodType=table

[28] U.S. Census Bureau. (2006). American Community Survey Content Test Report: Evaluation Report Covering Disability. Retrieved from https://www.census.gov/content/dam/Census/library/working-papers/2007/acs/2007_Brault_01.pdf

[29] U.S. Census Bureau. (2013). ACS Demographic and Housing Estimates, American Community Survey 3-Year estimates, 2011-2013, Table DP05. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_DP05&prodType=table

[30] World Health Organization. (2014). Ambient (outdoor) air quality and health. Retrieved from http://www.who.int/mediacentre/factsheets/fs313/en/

[31] National Association of County & City Health Officials (NACCHO). (2013). Statement of Policy: Healthy Food Access. Retrieved from http://www.naccho.org/advocacy/positions/upload/13-04-Healthy-Food-Access-2.pdf

[32] Oregon Blue Book (2015). Linn County. Retrieved from http://bluebook.state.or.us/local/counties/counties22.htm

[33] National Oceanic and Atmospheric Administration. (2015). Climate Data Online. Retrieved from: http://www.ncdc.noaa.gov/cdo-web/

[34] United States Department of Agriculture. (2015). Natural resources conservation service SNOTEL data. Retrieved from http://www.nrcs.usda.gov/wps/portal/nrcs/detail/or/snow/products/?cid=nrcs142p2_046165

[35] Oregon Climate Service. (2015). Oregon Climate Data. Retrieved from http://www.ocs.orst.edu/oregon-climate-data

[36] Active Living Research. (2011). Research Brief: The Power of Trails for Promoting Physical Activity in Communities. Retrieved from http://activelivingresearch.org/files/ALR_Brief_PowerofTrails_0.pdf

[37] City of Newport Bicycle and Pedestrian Advisory Committee. (2008). Newport Pedestrian and Bicycle Plan. Retrieved from http://www.thecityofnewport.net/dept/pln/documents/Newport-Pedestrian-Bicycle-Plan_July2008.pdf

[38] Centers for Disease Control and Prevent. (2015). Community Health Status Indicators: Lincoln County, OR. Retrieved from http://wwwn.cdc.gov/CommunityHealth/profile/currentprofile/OR/Lincoln/

[39] Centers for Disease Control and Prevent. (2015). Community Health Status Indicators: Benton County, OR. Retrieved from http://wwwn.cdc.gov/CommunityHealth/profile/currentprofile/OR/Benton/

[40] Centers for Disease Control and Prevent. (2015). Community Health Status Indicators: Linn County, OR. Retrieved from http://wwwn.cdc.gov/CommunityHealth/profile/currentprofile/OR/Linn/

[41] Community Prevention Services Task Force. (2013). Preventing Dental Caries: Community Water Fluoridation: Task Force Finding and Rationale Statement. Retrieved from http://www.thecommunityguide.org/oral/supportingmaterials/RRfluoridation.html

[42] Centers for Disease Control and Prevention. (1999). Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries. *MMWR, 48*(41), 933-940. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4841a1.htm

[43] Center for Disease Control. (2012). Community Water Fluoridation, 2012 Water Fluoridation Statistics. Retrieved from http://www.cdc.gov/fluoridation/statistics/2012stats.htm

[44] Center for Disease Control (2008). Oral Health Data Systems. Retrieved from http://apps.nccd.cdc.gov/MWF/SearchResultsV.asp?State=OR&StateName=Oregon&County=Linn&StartPG=1&EndPG=20

[45] Centers for Disease Control and Prevention. (2013). Designing and Building Healthy Places. Retrieved from http://www.cdc.gov/healthyplaces/

[46] Centers for Disease Control and Prevention. (2013). Indoor Environmental Quality. Retrieved from http://www.cdc.gov/niosh/topics/indoorenv/

[47] Berkeley Lab, Indoor Air Quality Scientific Findings Resource Bank. (2013). Health Risk of Dampness or Mold in Houses. Retrieved from http://www.iaqscience.lbl.gov/dampness-risks-house.html

[48] Personal communication with Benton County TPEP coordinator. (2015). Tobacco Prevention and Education Program Plan Update.

[49] Personal communication with Linn County TPEP coordinator. (2015). Tobacco Prevention and Education Program Plan Update.

[50] Lincoln County, Oregon. (2013). Smoking at County Facilities. Lincoln County Ordinances 7.550 – 7.580. Retrieved from http://www.co.lincoln.or.us/sites/default/files/fileattachments/county_counsel/page/384/2013-lcc-chapter-07.pdf

[51] Personal communication with Benton County TPP coordinator. (2015). Tobacco Prevention and Education Program Plan Update.

[52] Personal Communication with Linn County TPEP coordinator. (2015). Tobacco Prevention and Education Program Plan Update.

[53] Lincoln County, Oregon. (2013). Smoking at County Facilities. Lincoln County Ordinances 7.550 – 7.580. Retrieved from http://www.co.lincoln.or.us/sites/default/files/fileattachments/county_counsel/page/384/2013-lcc-chapter-07.pdf

[54] Robert Wood Johnson Foundation, County Health Rankings. (2015). Retrieved from http://www.countyhealthrankings.org/

[55] Oregon Health Authority. (2015). Environmental Public Health Tracking. Retrieved from https://public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/EnvironmentalPublicHealthTracking/Pages/index.aspx

[56] Oregon Food Bank. (2011). Rural Grocery Store Owner and Customer Assessment: Benton County. Retrieved from http://www.oregonfoodbank.org/~/media/files/community-food-systems/rural%20grocer%20reportfinaloptpdf.pdf

[57] Robert Wood Johnson Foundation, County Health Rankings. (2015). Retrieved from http://www.countyhealthrankings.org/

[58] Oregon Health Authority. (2015). Environmental Public Health Tracking. Retrieved from https://public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/EnvironmentalPublicHealthTracking/Pages/index.aspx

[59] http://www.who.int/social_determinants/en/

[60] World Health Organization. *(*2011*).* Rio Political Declaration on Social Determinants of Health. *Geneva: WHO.* Endorsed by WHO Member States at the Sixty-fifth World Health Assembly (WHA) in Geneva, Switzerland in May 2012. Retrieved from *http://www.who.int/sdhconference/declaration/en/.*

[61] http://www.improvingpopulationhealth.org/blog/2012/04/the-link-between-income-and-health.html

[62] http://www.nber.org/reporter/spring03/health.html

[63] Institute for Policy Studies. (2015). Inequality and Health. Retrieved from http://inequality.org/inequality-health/

[64] https://www.census.gov/hhes/www/poverty/about/overview/measure.html

[65] US Census Bureau (2009-2013). Table S1701 Poverty Status in the Past 12 months: American Community Survey 3-Year Estimates. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S1701&prodType=table

[66] Centers for Disease Control and Prevention: Morbidity and Mortality Weekly Report. (2013). CDC Health Disparities and Inequalities Report – United States, 2013. Retrieved from http://www.cdc.gov/mmwr/pdf/other/su6203.pdf

[67] US Census Bureau (2009-2013). Table S1701 Poverty Status in the Past 12 months: American Community Survey 3-Year Estimates. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S1701&prodType=table

[68] U.S. Census Bureau. (2013). Table S1701: Poverty Status in the Last 12 Months, 2011-2013 American Community Survey 3-Year Estimates.

[69] U.S. Department of Health and Human Services: Office of the Assistant Secretary for Planning and Evaluation. (2015). 2015 Poverty Guidelines. Retrieved from http://aspe.hhs.gov/2015-poverty-guidelines

[70] http://www.commissiononhealth.org/PDF/0e8ca13d-6fb8-451d-bac8-7d15343aacff/Issue%20Brief%204%20Dec%2008%20-%20Work%20and%20Health.pdf

[71] State of Oregon Employment Department. (2015). Economic Data: Unemployment Rates: Local Area Unemployment Statistics (LAUS). Retrieved from https://www.qualityinfo.org/ed-uesti/?at=1&t1=4101000000,4121010540,4121018700,4104000041~unemprate~y~2005~2015

[72] State of Oregon Employment Department. (2015). April 2015 Employment and Unemployment in Oregon's Counties. Retrieved from https://www.qualityinfo.org/documents/10182/73818/Labor+Force+and+Unemployment+by+Area?version=1.10

[73] U.S. Census Bureau. (2013). Table B08126: Means of Transportation to Work by Industry, 2011-2013. American Community Survey 3-Year Estimates.

[74] http://www.npc.umich.edu/publications/policy_briefs/brief9/

[75] http://www.bls.gov/emp/ep_chart_001.htm

[76] Braveman, P., Sadegh-Nobari, T., & Egerter, S. (2011). Issue brief series: Exploring the social determinants of health: Early childhood experiences and health. Retrieved from eric.ed.gov

[77] Benefits.gov. (2015). Oregon Head Start. Retrieved from http://www.benefits.gov/benefits/benefit-details/1935

[78] Oregon Department of Education, Early Learning Division. (2014). Oregon Head Start Prekindergarten Programs 2013-2014 Directory. Retrieved from http://www.ode.state.or.us/superintendent/priorities/2013-14-opkhsdirectory---final.pdf

[79] Oregon State University. (2012). Child Care and Education in Linn County. Retrieved from http://health.oregonstate.edu/sites/default/files/occrp/pdf/Linn-County-Child-Care-Profile-2012.pdf

[80] Oregon State University. (2012). Child Care and Education in Benton County. Retrieved from http://health.oregonstate.edu/sites/default/files/occrp/pdf/Benton-County-Child-Care-Profile-2012.pdf

[81] Oregon State University. (2012). Child Care and Education in Lincoln County. Retrieved from http://health.oregonstate.edu/sites/default/files/occrp/pdf/Lincoln-County-Child-Care-Profile-2012.pdf

[82] McCarty, C.A., Mason, W.A., Kosterman, R., Hawkins, J.D., Lengua, L.J., & McCauley, E. (2008). Adolescent school failure predicts later depression among girls. *Journal of Adolescent Health*, 43(2), 180-187.; Bogart, L.M., Collins, R.L., Ellickson, P.L., and Klein, D.J. Are adolescent substance users less satisfied with life as young adults and if so, why? *Social Indicators Research*, 81(1), 149-169

[83] Robert Wood Johnson Foundation, Commission to Build a Healthier America. (2011). Issue Brief 5: Exploring the Social Determinants of Health: Education and Health. Retrieved from http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2011/rwjf70447

[84] Oregon Department of Human Services, Oregon Tobacco Prevention and Education Program. (2007). Oregon adults who have lower income or have not finished high school data report-2007. Retrieved from www.public.health.oregon.gov/PreventionWellness/TobaccoPrevention/Documents/lowincomefact.pdf

[85] U.S. Census Bureau. (2013). Table S1501: Educational Attainment, 2011-2013. American Community Survey 3-Year Estimates.

[86] Anderson, S.A. (1990). Core indicators of nutritional state for difficult to sample populations. *The Journal of Nutrition*, 120(11), 1555-1600.

[87] Bhattacharya, J., Currie, J., & Haider, S. (2004). Poverty, food insecurity, and nutritional outcomes in children and adults. *Journal of Health Economics*, 23, 839-862.

[88] Department of Agriculture: Food and Nutrition Service. (2013). Child Nutrition Programs; Income Eligibility Guidelines. Retrieved from http://www.fns.usda.gov/sites/default/files/IEG_Table-032913.pdf

[89] U.S. Department of Health and Human Services: Office of the Assistant Secretary for Planning and Evaluation. (2015). 2015 Poverty Guidelines. Retrieved from http://aspe.hhs.gov/2015-poverty-guidelines

[90] Feeding America. (2010). Map the Meal Gap, Food Insecurity in Your County: Linn County, Oregon. Retrieved from www.feedingamerica.org/mapthegap

[91] Oregon Health Authority. (2015). WIC Eligibility Guidelines. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/wic/Pages/income.aspx

[92] Oregon Health Authority. (2014). 2014 WIC Facts: Linn County Health Department. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual_linn.pdf

[93] Oregon Health Authority. (2014). 2014 WIC Facts: Benton County Health Department. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual_benton.pdf

[94] Oregon Health Authority. (2014). 2014 WIC Facts: Lincoln County Health Department. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual_lincoln.pdf

[95] Linn Benton Food Share. (2015). Annual Newsletter. Retrieved from http://communityservices.us/files/Linn_Benton_Food_Share_Newsletter_2015_Final.pdf
[96] Linn Benton Food Share. (2015). Annual Newsletter. Retrieved from http://communityservices.us/files/Linn_Benton_Food_Share_Newsletter_2015_Final.pdf
[97] http://www.oregonfoodbank.org/understanding-hunger/ofb-network-stats
[98] Linn Benton Food Share. (2015). Annual Newsletter. Retrieved from http://communityservices.us/files/Linn_Benton_Food_Share_Newsletter_2015_Final.pdf
[99] U.S. Department of Housing and Urban Development. (2015). Affordable Housing. Retrieved from http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/
[100] Ending Homelessness Advisory Council. (2008). A Home for Hope: A Ten Year Plan to End Homelessness in Oregon. Retrieved from http://www.oregon.gov/ohcs/pdfs/report-ehac-10-year-action-plan.pdf
[101] Health Resources and Services Administration (2015). Uniform Data System Health Center Program Grantee Profiles. Retrieved from http://bphc.hrsa.gov/uds/datacenter.aspx?q=d&year=2014&state=OR#glist.
[102] Virginia Commonwealth University Center on Society and Health. (2014). Health Care: Necessary But Not Sufficient. Retrieved from http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2014/rwjf415715
[103] The Henry J. Kaiser Family Foundation. (2012). Focus on Healthcare Disparities: Key Facts. Retrieved from https://kaiserfamilyfoundation.files.wordpress.com/2012/11/8396-disparities-in-health-and-health-care-five-key-questions-and-answers.pdf
[104] The Henry J. Kaiser Family Foundation. (2015). Key Facts about the Uninsured Population. Retrieved from http://files.kff.org/attachment/fact-sheet-key-facts-about-the-uninsured-population
[105] The Henry J. Kaiser Family Foundation. (2013). The Uninsured A Primer 2013-4: How does lack of health insurance affect access to health care? Retrieved from http://kff.org/report-section/the-uninsured-a-primer-2013-4-how-does-lack-of-insurance-affect-access-to-health-care/
[106] Oregon Health Authority, Office of Health Analytics. (2014). Oregon Health Plan: Coordinated Care, Managed Care and Fee for Service Enrollment for January 15, 2014. Retrieved from http://www.oregon.gov/oha/healthplan/DataReportsDocs/January%202014%20Coordinated%20Care%20Service%20Delivery%20by%20County.pdf
[107] Oregon Health Authority, Office of Health Analytics. (2014). State of Oregon: Oregon Health Plan, Medicaid, and CHIP Population by County and Medical Care Delivery System: 15 January 2010. Retrieved from http://www.oregon.gov/oha/healthplan/DataReportsDocs/January%202010%20Physical%20Health%20Service%20Delivery%20by%20County.pdf
[108] Oregon Health Authority, Oregon Health & Science University. (2015). Impacts of the Affordable Care Act on Health Insurance Coverage in Oregon: County Results/Statewide Update. Retrieved from http://www.ohsu.edu/xd/research/centers-institutes/center-for-health-systems-effectiveness/upload/Health-Insurance-Coverage-in-Oregon-County-Results.pdf
[109] Oregon Health Authority, Oregon Health & Science University. (2015). Impacts of the Affordable Care Act on Health Insurance Coverage in Oregon: County Results/Statewide Update. Retrieved from http://www.ohsu.edu/xd/research/centers-institutes/center-for-health-systems-effectiveness/upload/Health-Insurance-Coverage-in-Oregon-County-Results.pdf
[110] Oregon Health Authority, Oregon Health & Science University. (2015). Impacts of the Affordable Care Act on Health Insurance Coverage in Oregon: County Results/Statewide Update. Retrieved from http://www.ohsu.edu/xd/research/centers-institutes/center-for-health-systems-effectiveness/upload/Health-Insurance-Coverage-in-Oregon-County-Results.pdf
[111] U.S. Census Bureau. (2013). Health Insurance Coverage Status, American Community Survey 3-Year estimates, 2011-2013, Table S2701. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S2701&prodType=table
[112] U.S. Census Bureau. (2013). Health Insurance Coverage Status, American Community Survey 3-Year estimates, 2011-2013, Table S2701. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S2701&prodType=table
[113] UCLA Center for Health Policy Research. (2012). Undocumented Immigrants and Health Care Reform. Retrieved from http://healthpolicy.ucla.edu/publications/Documents/PDF/undocumentedreport-aug2013.pdf
[114] U.S. Census Bureau. (2013). Health Insurance Coverage Status, American Community Survey 3-Year estimates, 2011-2013, Table S2701. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S2701&prodType=table
[115] Alliance for a Justice Society. (2015). Breaking Barriers: Improving Health Insurance Enrollment and Access to Health Care. Retrieved from http://allianceforajustsociety.org/wp-content/uploads/2015/04/BreakingBarriers_Natl_sm.pdf
[116] Riffkin R. (2014). Cost Still a Barrier Between Americans and Medical Care. *Gallup Poll.* Retrieved from http://www.gallup.com/poll/179774/cost-barrier-americans-medical-care.aspx
[117] Robert Wood Johnson Foundation, County Health Rankings & Roadmaps. (2015). Could not see a doctor due to cost. Retrieved from http://www.countyhealthrankings.org/app/oregon/2015/measure/additional/87/data
[118] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Access to Health Services. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/Access-to-Health-Services
[119] Robert Wood Johnson Foundation. (2012). Health Care Safety Net Resources by State. Retrieved from http://www.rwjf.org/en/library/research/2012/02/health-care-safety-net-resources-by-state.html

[120] U.S. Department of Health and Human Services, Health Resources and Services Administration. (n.d.). Health Professional Shortage Areas (HPSAs). Retrieved from http://bhpr.hrsa.gov/shortage/hpsas/

[121] National Association of Community Health Centers, Inc. (n.d.). Migrant and Seasonal Farmworker Access to Health Care Services and Insurance Coverage: Summary Report on Issues, Resources and Potential Solutions. Retrieved from http://www.cpca.org/cpca/assets/File/Policy-and-Advocacy/Active-Policy-Issues/MSFW/MSFW_access_to_health_care_services.pdf

[122] Oregon Office of Rural Health. (2015). 2015 Areas of Unmet Health Care Need in Rural Oregon Report. Retrieved from http://www.ohsu.edu/xd/outreach/oregon-rural-health/data/upload/2015-Unmet-Need-Report.pdf

[123] Oregon Office of Rural Health. (2015). 2015 Areas of Unmet Health Care Need in Rural Oregon Report. Retrieved from http://www.ohsu.edu/xd/outreach/oregon-rural-health/data/upload/2015-Unmet-Need-Report.pdf

[124] Samaritan Health Services. (2015). Surgical Services. Retrieved from http://www.samhealth.org/services/surgery/Pages/services.aspx

[125] Samaritan Health Services (2015). Women's Center (SAGH). Retrieved 1 November 2013 from http://www.samhealth.org/services/womensservices/Pages/womenscentersagh.aspx

[126] Samaritan Health Services. (2015). Imagine services by location. Retrieved from http://www.samhealth.org/SiteCollectionDocuments/imaging-chart_05.2011.pdf

[127] Gindi, R., Cohen, R., and Kirzinger, W. (2012). Emergency Room Use Among Adults Aged 18–64: Early Release of Estimates From the National Health Interview Survey, January–June 2011. Retrieved from http://www.cdc.gov/nchs/data/nhis/earlyrelease/emergency_room_use_january-june_2011.pdf

[128] Samaritan Health Services (2015). Hospice and Palliative Care. Retrieved from http://www.samhealth.org/services/hospicepalliativecare/Pages/default.aspx

[129] Oregon Health Authority, Oregon public Health Division, Oregon Vital Statistics County data 2013. (2013). Table 19. Tobacco-linked deaths by county of residence, Oregon 2013. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/VitalStatistics/annualreports/CountyDataBook/Documents/2013/table19-2013.pdf

[130] Macera, C., Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. (n.d.). Promoting Healthy Eating and Physical Activity for a Healthier Nation. Retrieved from http://www.cdc.gov/healthyyouth/publications/pdf/pp-ch7.pdf

[131] Oregon Health Authority, Oregon Public Health Division, Oregon Vital Statistics County data 2013. (2013). Table 18. Leading causes of death by county of residence, Oregon, 2013. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/VitalStatistics/annualreports/CountyDataBook/Documents/2013/table18-2013.pdf

[132] American Cancer Society. (2015). Cancer Facts and Figures 2015. Retrieved from: http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-044552.pdf

[133] Oregon Health Authority, Oregon Public Health Division, Tobacco Prevention and Education Program. (2013). Oregon Tobacco Facts: Tobacco-Related Diseases. Retrieved from https://public.health.oregon.gov/PreventionWellness/TobaccoPrevention/Documents/tobacco_facts/tobacco-related_diseases.pdf

[134] Oregon Health Authority, Oregon Public Health Division. (2012). Cancer in Oregon. *CD Summary,* 61(19). Retrieved from http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/CDSummaryNewsletter/Documents/2012/ohd6119.pdf

[135] Oregon Health Authority, Oregon Public Health Division. (2012). Cancer in Oregon. *CD Summary,* 61(19). Retrieved from http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/CDSummaryNewsletter/Documents/2012/ohd6119.pdf

[136] Oregon Health Authority. (2014). Oregon Tobacco Laws and Policies. Retrieved from http://public.health.oregon.gov/PreventionWellness/TobaccoPrevention/Documents/tobfacts.pdf

[137] American Cancer Society. (2012). Cancer Facts and Figures 2012. Retrieved from: http://www.cancer.org/acs/groups/content/%40epidemiologysurveilance/documents/document/acspc-031941.pdf

[138] Susan G. Komen Foundation. (n.d.). Facts and Statistics. Retrieved from http://ww5.komen.org/BreastCancer/FactsandStatistics.html

[139] National Cancer Institute, State Cancer Profiles. (n.d.). Incidence Rates Table, Breast (Female). Retrieved from http://statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=41&cancer=055&race=00&sex=2&age=001&type=incd#results

[140] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Cancer, C-3. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives

[141] Oregon Health Authority, Oregon State Cancer Registry. (2006). Cancer in Oregon, 2006. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Cancer/oscar/Documents/ar2006/ar06.pdf

[142] Office of Disease Prevention and Health Promotion, Healthy People 2020 (2014). 2020 Topics & Objectives: Cancer. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives

[143] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Cancer, C-5. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives

[144] National Cancer Institute, State Cancer Profiles. (n.d.). Incidence Rates Table, Pancreas. Retrieved from http://www.statecancerprofiles.cancer.gov/incidencerates/index.php?stateFIPS=41&cancer=040&race=00&sex=0&age=001&type=incd#results

[145] Oregon Health Authority, Public Health Division, Health Promotion & Chronic Disease Prevention Section. (2013). Diabetes, Heart Disease and Stroke in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Documents/OHA8582_AllVolumes.pdf

[146] Franks, P., Winters, P., Tancredi, D., Fiscella, K. (2011). Do changes in traditional coronary heart disease risk factors over time explain the association between socio-economic status and coronary heart disease? *BMC Cardiovascular Disorders,* 11(28). Retrieved from http://www.biomedcentral.com/1471-2261/11/28

[147] Oregon Health Authority, Public Health Division, Office of Disease Prevention and Epidemiology. (2010). Heart Disease and Stroke in Oregon: Update - 2010. Retrieved from http://public.health.oregon.gov/DiseasesConditions/ChronicDisease/HeartDiseaseStroke/Documents/heartstroke_update2010.pdf

[148] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Heart Disease Mortality, by Case and County. Retrieved from https://ophat.public.health.oregon.gov

[149] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Heart Disease and Stroke, Objectives. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/heart-disease-and-stroke/objectives

[150] American Diabetes Association. (n.d.). Lower Your Risk. Retrieved from http://www.diabetes.org/are-you-at-risk/lower-your-risk/

[151] Oregon Health Authority, Public Health Division, Oregon BRFSS County Combined Dataset. (2008-2011). Table 1: Age-Adjusted and Unadjusted Prevalence of Selected Chronic Conditions among Adults, by County, Oregon 2008-2011. Retrieved from http://public.health.oregon.gov/BirthDeathCertificates/Surveys/AdultBehaviorRisk/county/Documents/0811/ORCounty_conditions.pdf

[152] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Diabetes, Objectives. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/diabetes/objectives

[153] Oregon Health Authority, Public Health Division, Oregon BRFSS County Combined Dataset. (2008-2011). Table 1: Age-Adjusted and Unadjusted Prevalence of Selected Chronic Conditions among Adults, by County, Oregon 2008-2011. Retrieved from http://public.health.oregon.gov/BirthDeathCertificates/Surveys/AdultBehaviorRisk/county/Documents/0811/ORCounty_conditions.pdf

[154] Garland-Forshee, R., Gedman, T., Oregon Health Authority, Public Health Division, Center or Prevention and Health Promotion, Oregon Asthma Program. (2013). The Burden of Asthma in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Asthma/Documents/burden/OR_Asthma_2013.pdf

[155] Garland-Forshee, R., Gedman, T., Oregon Health Authority, Public Health Division, Center or Prevention and Health Promotion, Oregon Asthma Program. (2013). The Burden of Asthma in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Asthma/Documents/burden/OR_Asthma_2013.pdf

[156] Garland-Forshee, R., Gedman, T., Oregon Health Authority, Public Health Division, Center or Prevention and Health Promotion, Oregon Asthma Program. (2013). The Burden of Asthma in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/Asthma/Documents/burden/OR_Asthma_2013.pdf

[157] Oregon Health Authority, Public Health Division, Oregon BRFSS County Combined Dataset. (2008-2011). Table 1: Age-Adjusted and Unadjusted Prevalence of Selected Chronic Conditions among Adults, by County, Oregon 2008-2011. Retrieved from http://public.health.oregon.gov/BirthDeathCertificates/Surveys/AdultBehaviorRisk/county/Documents/0811/ORCounty_conditions.pdf

[158] World Health Organization. (n.d.). Health topics: Infectious diseases. Retrieved from http://www.who.int/topics/infectious_diseases/en/

[159] Oregon Health Authority, Public Health Division. (n.d.). Oregon Disease Reporting: What is Reportable and When. Retrieved from https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/Pages/reportable.aspx

[160] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Communicable Disease Reports, Case Count by Disease and County. Retrieved from https://ophat.public.health.oregon.gov

[161] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Communicable Disease Reports, Case Count by Disease and County. Retrieved from https://ophat.public.health.oregon.gov

[162] Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Foodborne, Waterborne, and Environmental Diseases. (2014). Estimates of foodborne illness in the United States. Retrieved from http://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html

[163] Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases, Division of Foodborne, Waterborne, and Environmental Diseases. (2014). Estimates of foodborne illness in the United States. Retrieved from http://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html

[164] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Communicable Disease Reports, Case Count by Disease and County. Retrieved from https://ophat.public.health.oregon.gov

[165] Centers for Disease Control and Prevention. (2011). STDs in Women and Infants. Retrieved from http://www.cdc.gov/std/stats10/womenandinf.htm

[166] Oregon Health Authority, Public Health Division. (2014). Chlamydia in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/DiseaseSurveillanceData/STD/Documents/9980STD-Chlamydia.pdf

[167] Oregon Health Authority, Public Health Division. (2014). Gonorrhea in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/DiseaseSurveillanceData/STD/Documents/9987-STD-Gonorrhea.pdf

[168] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Communicable Disease Reports, Case Count by Disease and County. Retrieved from https://ophat.public.health.oregon.gov

[169] Robert Wood Johnson Foundation, County Health Rankings & Roadmaps. (2013). Linn County Snapshot. Retrieved from http://www.countyhealthrankings.org/app/oregon/2012/linn/county/1/overall/snapshot/by-rank

[170] National Archive of Criminal Justice Data. (2012). Uniform Crime Reporting Program Data: County-level detailed arrest and offense data, 2012 (ICPSR 35019). Retrieved from http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/35019

[171] Oregon Health Authority, Public Health Division, Oregon Violent Death Reporting System. (2013). Violent Deaths in Oregon: 2013 Retrieved from https://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/NVDRS/NVDRS-Report.pdf

[172] Oregon Health Authority, Public Health Division. (2012). Causes of Death: Leading Causes of Death. Retrieved from https://public.health.oregon.gov/ProviderPartnerResources/PublicHealthAccreditation/Documents/indicators/leadingcausesofdeath.pdf

[173] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Injury and Violence Prevention. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/injury-and-violence-prevention/national-snapshot?topicId=24

[174] Oregon Health Authority, Public Health Division, Injury and Violence Prevention Program. (2013). Injury in Oregon, 2013 Injury Data Report. Retrieved from https://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/Injury_in_Oregon_v2.3.pdf

[175] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Mental Health. Retrieved from http://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Mental-Health/determinants?tab=determinants

[176] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Mental Health. Retrieved from http://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Mental-Health

[177] Robert Wood Johnson Foundation, County Health Rankings & Roadmaps. (2014). Linn County Snapshot: Poor mental health days. Retrieved from http://www.countyhealthrankings.org/app/oregon/2014/rankings/linn/county/outcomes/overall/snapshot

[178] Oregon Health Authority, Public Health division, Oregon Behavioral Risk Factor Surveillance System. (2013). Oregon Adults in Good Mental Health, Oregon, 2008-2011 (Age-Adjusted). Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/AdultBehaviorRisk/county/Documents/0811/MentalHealthAA_0811.pdf

[179] Oregon Health Authority, Public Health Division, Oregon Behavioral Risk Factor Surveillance System. (2013). Chronic diseases among Oregon adults, by county, 2010-2013. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/DataReports/Documents/datatables/ORCountyBRFSS_diseases.pdf

[180] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Selected Causes of Death by County. Retrieved from https://ophat.public.health.oregon.gov

[181] World Health Organization. (n.d.). The implications for training of embracing: A Life Course Approach to Health. Retrieved from http://www.who.int/ageing/publications/lifecourse/alc_lifecourse_training_en.pdf

[182] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Birth Risk Factors: Percent of Births for which Birth Risk Factor is Present. Retrieved from https://ophat.public.health.oregon.gov

[183] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Birth Risk Factors: Percent of Births for which Birth Risk Factor is Present. Retrieved from https://ophat.public.health.oregon.gov

[184] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health. (2007). Preventing Smoking and Exposure to Secondhand Smoke Before, During, and After Pregnancy. Retrieved from http://www.cdc.gov/nccdphp/publications/factsheets/prevention/pdf/smoking.pdf

[185] Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities, Division of Birth Defects and Developmental Disabilities. (2014). Fetal Alcohol Spectrum Disorders (FASDs). Retrieved from http://www.cdc.gov/ncbddd/fasd/alcohol-use.html

[186] Oregon Health Authority, Public Health Division. (2011). Oregon PRAMS: 2011 Results. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/DataReports/prams/Documents/OregonPRAMS2011.pdf

[187] U.S. Department of Health and Human Services, National Institute of Child Health and Human Development. (2013). What are the factors that put a pregnancy at risk? Retrieved from http://www.nichd.nih.gov/health/topics/high-risk/conditioninfo/pages/factors.aspx

[188] Planned Parenthood Federation of America. (2013). Pregnancy and Childbearing Among U.S. Teens. Retrieved from http://www.plannedparenthood.org/files/2013/9611/7570/Pregnancy_And_Childbearing_Among_US_Teens.pdf

[189] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Birth Risk Factors: Percent of Births for which Birth Risk Factor is Present. Retrieved from https://ophat.public.health.oregon.gov

[190] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Maternal, Infant, and Child Health. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives

[191] Barker, D.J., Osmond, C. (1986). Infant Mortality, Childhood Nutrition and Ischaemic Heart Disease in England and Wales. *Lancet,* 327(8489), 1077-81. DOI: 10.1111/j.1365-2796.2007.01809.x

[192] Hack, M., Klein, N., Taylor, H. (1995). Long-term developmental outcomes of low birthweight children. *Future Child, 5*(1), 176-196. DOI: 0.2307/1602514

[193] World Health Organization. (2015). Preterm birth. Retrieved from http://www.who.int/mediacentre/factsheets/fs363/en/

[194] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Birth Risk Factors: Percent of Births for which Birth Risk Factor is Present. Retrieved from https://ophat.public.health.oregon.gov

[195] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Maternal, Infant, and Child Health, Objectives. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives

[196] American Academy of Pediatrics. (2012). Policy Statement: Breastfeeding and the use of human milk. *Pediatrics*, *129*(3), 827-841. Retrieved from http://pediatrics.aappublications.org/content/129/3/e827

[197] Oregon Health Authority, Public Health Division, Oregon WIC Program. (2014). 2014 WIC Facts. Retrieved from https://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual_all.pdf

[198] Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. (2014). Adverse Childhood Experiences (ACE) study. Retrieved from http://www.cdc.gov/ace/outcomes.htm

[199] Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) study. *American Journal of Preventive Medicine*, *14*(4), 245-258. Retrieved from http://www.theannainstitute.org/ACE%20folder%20for%20website/4RCH.pdf

[200] Oregon Health Authority, Addictions and Mental Health Division. (2014). 2014 Oregon Student Wellness Survey: Linn County. Retrieved from https://oregon.pridesurveys.com/dl.php?pdf=Linn_Co_2014.pdf&type=county

[201] Oregon Health Authority, Addictions and Mental Health Division. (2014). 2014 Oregon Student Wellness Survey: Lincoln County. Retrieved from https://oregon.pridesurveys.com/dl.php?pdf=Lincoln_Co_2014.pdf&type=county

[202] Oregon Health Authority, Addictions and Mental Health Division. (2014). 2014 Oregon Student Wellness Survey: Benton County. Retrieved from https://oregon.pridesurveys.com/dl.php?pdf=Benton_Co_2014.pdf&type=county

[203] Oregon Department of Human Services, Children, Adults and Families Division. (2015). 2014 Child Welfare Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2014%20Data%20Book.pdf

[204] Oregon Department of Human Services, Children, Adults and Families Division. (2015). 2014 Child Welfare Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2014%20Data%20Book.pdf

[205] Oregon Department of Human Services, Children, Adults and Families Division. (2012). 2011 Child Welfare Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2011-cw-data-book.pdf

[206] Oregon Department of Human Services, Children, Adults and Families Division. (2013). 2012 Foster Care Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2012-cw-data-book.pdf

[207] Oregon Department of Human Services, Children, Adults and Families Division. (2014). 2013 Child Welfare Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2013%20Data%20Book.pdf

[208] Oregon Department of Human Services, Children, Adults and Families Division. (2015). 2014 Child Welfare Data Book. Retrieved from http://www.oregon.gov/dhs/children/child-abuse/Documents/2014%20Data%20Book.pdf

[209] Oregon Department of Health Services. (2015). Foster Care. Retrieved from http://www.oregon.gov/dhs/children/fostercare/pages/index.aspx

[210] Bosworth, K., Espelage, D., Simon, T. (1999). Factors associated with bullying behavior in middle school students. *Journal of Early Adolescence*, *19*(3), 341-362. Retrieved from http://extension.fullerton.edu/professionaldevelopment/assets/pdf/bullying/bullying_and_middleschool_students.pdf

[211] Oregon Health Authority. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[212] Oregon Health Authority. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[213] World Health Organization. (2014). Mental health: strengthening our response. Retrieved from http://www.who.int/mediacentre/factsheets/fs220/en/

[214] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Suicide Rates, 2009-2013. Retrieved from https://ophat.public.health.oregon.gov

[215] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[216] Healthy People 2020. (2015). Physical Activity: Objectives. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/physical-activity/objectives

[217] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[218] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[219] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Physical Activity, PA-8.3.3. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/physical-activity/objectives

[220] U.S. Department of Health & Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. (2012). What Are the Health Risks of Overweight and Obesity? Retrieved from http://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks

[221] Kennedy, E. (2006). Evidence for Nutritional Benefits in Prolonging Wellness. *The American Journal of Clinical Nutrition, 83*(suppl), 410S-4S. Retrieved from http://ajcn.nutrition.org/content/83/2/410S.full.pdf

[222] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[223] National Institute of Dental and Craniofacial Research. (2014). Oral Health in America: A Report of the Surgeon General (Executive Summary). Retrieved from http://www.nidcr.nih.gov/DataStatistics/SurgeonGeneral/Report/ExecutiveSummary.htm

[224] Oregon Public Health Authority, Public Health Division. (n.d.). Oral Health for Infants and Children. Retrieved from http://public.health.oregon.gov/PreventionWellness/oralhealth/Pages/child.aspx

[225] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[226] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Oral Health. (2008). Populations Receiving Optimally Fluoridated Public Drinking Water – United States, 1992-2006. *MMWR, 57*(27), 737-741. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5727a1.htm

[227] Benton, Lincoln, Linn Regional Oral Health Coalition. (2015). Oral Health Needs in Benton, Lincoln and Linn Counties: An Assessment. Retrieved from http://www.samhealth.org/SiteCollectionDocuments/CommunitySupport/Regional%20NeedsAssessment2015.pdf

[228] Oregon Health & Science University, Portland State University. (2013). State of Our Health 2013: Key Health Indicators for Oregonians. Retrieved from https://www.ohsu.edu/xd/education/student-services/about-us/provost/upload/State-of-Our-Health-2013-monograph.pdf

[229] National Council on Alcoholism and Drug Dependence, Inc. (2015). Facts About Drugs. Retrieved from https://ncadd.org/about-addiction/faq/facts-about-drugs

[230] National Institutes of on Alcohol Abuse and Alcoholism. (2006). No. 68: Young Adult Drinking [factsheet]. Retrieved from http://pubs.niaaa.nih.gov/publications/aa68/aa68.htm

[231] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[232] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Substance Abuse. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/substance-abuse/objectives

[233] U.S. Department of Health and Human Services. (2012). Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Retrieved from http://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/full-report.pdf

[234] Oregon Healthy Authority, Public Health Division. (2007). Oregon Healthy Teens Survey: 2007 Results, County Level Results. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/2007/Pages/sda.aspx

[235] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[236] Oregon Health Authority, Public Health Division. (2015). Oregon Healthy Teens Survey: 2014/2015 School Year Results, 2015 County Reports. Retrieved from https://public.health.oregon.gov/BirthDeathCertificates/Surveys/OregonHealthyTeens/Pages/2015.aspx

[237] Oregon Department of Human Services: Child Welfare Program. (2015). Striving to meet the need: Summary of services provided by sexual and domestic violence programs in Oregon. Retrieved from http://www.oregon.gov/dhs/abuse/domestic/Documents/2014-dv-annual-report.pdf

[238] Center Against Rape and Domestic Violence CARDV. (2015). About CARDV. Retrieved from http://cardv.org/about.php

[239] Center Against Rape and Domestic Violence. (2015). Annual Report 2012-2013. Retrieved from http://cardv.org/files/2012-2013AnnualReport.pdf

[240] The National Child Traumatic Stress Network. (2015). Children and Domestic Violence. Retrieved from http://www.nctsn.org/content/children-and-domestic-violence

[241] U.S. Department of Health and Human Services, Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. (2010). Results from the 2010 National Survey on Drug Use and Health: Mental Health Findings. Retrieved from http://www.samhsa.gov/data/sites/default/files/NSDUHmhfr2010/NSDUHmhfr2010.htm#fig3-1

[242] Oregon Health Authority, Office of Health Analytics and Addictions and Mental Health Division. (2012). Linn County's Epidemiological Data on Alcohol, Drugs and Mental Health 2000 to 2012. Retrieved from http://www.oregon.gov/oha/amh/sew/CountyReports/Linn%20County%20-%20Epidemiological%20Data%20on%20Alcohol,%20Drugs%20and%20Mental%20Health%202000%20to%202012.pdf

[243] Oregon Health Authority, Office of Health Analytics and Addictions and Mental Health Division. (2012). Benton County's Epidemiological Data on Alcohol, Drugs and Mental Health 2000 to 2012. Retrieved from http://www.oregon.gov/oha/amh/sew/CountyReports/Benton%20County%20-%20Epidemiological%20Data%20on%20Alcohol,%20Drugs%20and%20Mental%20Health%202000%20to%202012.pdf

[244] Oregon Health Authority, Office of Health Analytics and Addictions and Mental Health Division. (2012). Lincoln County's Epidemiological Data on Alcohol, Drugs and Mental Health 2000 to 2012. Retrieved from http://www.oregon.gov/oha/amh/sew/CountyReports/Lincoln%20County%20-%20Epidemiological%20Data%20on%20Alcohol,%20Drugs%20and%20Mental%20Health%202000%20to%202012.pdf

[245] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Suicide rates, 2009-2013. Retrieved from https://ophat.public.health.oregon.gov

[246] Oregon Health Authority, Public Health Division, Oregon Violent Death Reporting System, Injury and Violence Prevention Program, Center for Prevention and Health Promotion. (2012). Suicides in Oregon: Trends and Risk Factors 2012 Report. Retrieved from http://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/NVDRS/Suicide%20in%20Oregon%202012%20report.pdf

[247] Oregon Health Authority, Oregon Public Health Assessment Tool. (2015). Suicide rates, 2009-2013. Retrieved from https://ophat.public.health.oregon.gov

[248] Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, and Obesity. (2015). Physical Activity Basics. Retrieved from http://www.cdc.gov/physicalactivity/basics/index.htm

[249] Oregon Health Authority, Public Health Division, Health Promotion and Chronic Disease Prevention Program. (2012). Oregon Overweight, Obesity, Physical Activity and Nutrition Facts. Retrieved from https://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Documents/Oregon_PANfactst_2012.pdf

[250] Oregon Health Authority, Public Health Division, Health Promotion and Chronic Disease Prevention. (2015). Health risk and protective factors among Oregon adults, by county, 2010-2013. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/DataReports/Documents/datatables/ORCountyBRFSS_riskfactors.pdf

[251] Oregon Health Authority, Public Health Division, Health Promotion and Chronic Disease Prevention Program. (2012). Oregon Overweight, Obesity, Physical Activity and Nutrition Facts. Retrieved from https://public.health.oregon.gov/PreventionWellness/PhysicalActivity/Documents/Oregon_PANfactst_2012.pdf

[252] Oregon Health Authority, Public Health Division, Health Promotion and Chronic Disease Prevention. (2015). Health risk and protective factors among Oregon adults, by county, 2010-2013. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/DataReports/Documents/datatables/ORCountyBRFSS_riskfactors.pdf

[253] Oregon Health Authority, Public Health Division. (2014). Oregon state health profiles, Overweight and obesity among adults and youth. Retrieved from http://public.health.oregon.gov/About/Pages/HealthStatusIndicators.aspx

[254] National Institute on Drug Abuse. (2014). Adolescents and Young Adults. Retrieved from http://www.drugabuse.gov/publications/research-reports/prescription-drugs/trends-in-prescription-drug-abuse/adolescents-young-adults

[255] Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention. (2015). Injury Prevention and Control: Prescription Drug Overdose, Risk Factors for Prescription Painkiller Abuse and Overdose. Retrieved from http://www.cdc.gov/drugoverdose/epidemic/riskfactors.html

[256] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health. (2004). Sociodemographic Differences in Binge Drinking Among Adults. *MMWR, 58(12);* 301-304. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5812a1.htm

[257] National Institutes on Alcohol Abuse and Alcoholism. (n.d.). Overview of Alcohol Consumption. Retrieved from http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption

[258] U.S. Department of Health and Human Services, National Institute of Health, National Institute of Alcohol Abuse and Alcoholism. (2004). No. 3, NIAAA council approves definition of binge drinking. Retrieved from http://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf

[259] Oregon Health Authority, Public Health Division. (2013). Health risk and protective factors among Oregon adults, by county, 2010-2013. Retrieved from https://public.health.oregon.gov/DiseasesConditions/ChronicDisease/DataReports/Documents/datatables/ORCountyBRFSS_riskfactors.pdf

[260] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Substance Abuse, Objectives. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/substance-abuse/objectives

[261] U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2015). Healthy People 2020: Tobacco, Overview & Impact. Retrieved from https://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Tobacco

[262] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. (2014). Health Effects of Secondhand Smoke. Retrieved from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/health_effects/index.htm

[263] Oregon Health Authority, Public Health Division, Injury and Violence Prevention Program. (2015). Falls among older adults in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/Fact%20Sheets/Falls_Older_Adults_2015v02262015.pdf

[264] Oregon Health Authority, Public Health Division, Injury and Violence Prevention Program. (2015). Falls among older adults in Oregon. Retrieved from https://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/Fact%20Sheets/Falls_Older_Adults_2015v02262015.pdf

[265] County Health Rankings. (2016). Retrieved from http://www.countyhealthrankings.org/app/oregon/2016/rankings/linn/county/outcomes/overall/snapshot

[266] County Health Rankings. (2016). Retrieved from http://www.countyhealthrankings.org/app/oregon/2016/rankings/linn/county/outcomes/overall/snapshot