

KERN COUNTY
Public Health Services
DEPARTMENT

Community Health Assessment

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Kern County Department of Public Health Services

Community Health Assessment

Introduction

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) The health of every individual affects and is affected by a number of factors. Our personal health can influence our decisions as well as determine our options. Good health can be liberating while poor health can be limiting. Likewise, the state of our health can be shaped by lifestyle choices, genetics, socioeconomic status, occupation, place of residence, and environment. Our personal health can also have profound effects on others as well; healthcare costs can create immense financial burdens on our families as well as society.

The Kern County Public Health Services Department seeks to adapt to and anticipate the ever changing health needs of the community through strong partnerships with community groups as well as individual members and with the guidance of state and federal agencies. To summarize the health of the community and assess any unmet needs, the Kern County Public Health Services Department examined currently published data, unpublished data, and information from various community groups, private enterprises, and government agencies. In addition to evaluating physiological health, social determinants such as economic stability and environmental conditions were analyzed.

Health indicators are common characteristics used to gauge the health of a population over time and allows comparisons across geographies. Throughout the report, Kern County will be compared to the state and national averages as well as the Healthy People 2020 National Objectives. Healthy People 2020 is a compilation of 1,200 objectives in 42 topic areas aimed at improving the health of all Americans. The objectives may measure anything from specific health conditions to environmental influences of health to social factors. The most recently available data is used while still maintaining consistency across jurisdictions. For example, when comparing Kern County data to state or federal data, older data sets may be analyzed even though more recent data is available at the local level.

The Kern County Public Health Services Department hopes that this report will be a useful resource for health professionals as well as policy makers, program planners, and community members. If you have questions or would like to make suggestions about health indicators to include in future editions, please contact the Kern County Public Health Services Department by telephone at (661) 321-3000.

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Section 1: Population

Demographics

Kern County is the eleventh most populous county in California with a 2016 population estimate of 886,507 residents. (2) Covering 8,161 square miles, it is the third-largest county by area and includes 43 square miles of State parks, reserves, historic parks, and recreation areas. (3) Geography includes mountain ranges to valley floor to arid desert. Kern County is California's largest producer of petroleum-based energy, home to the top five producing oil fields in California and five of the top 25 producing oil fields in the nation. (4) Kern County's agriculture industry produces more than \$5 billion worth of goods annually including milk, almonds, table grapes, vegetables, and pistachios. (5) There are four state prisons and two federal correctional facilities operated within the County's boundaries.

Kern County residents account for 2.3 percent of the population of California. (6) Kern County has a larger proportion of residents less than 18 years of age and a smaller proportion of

	< 18 years	18-64 years	65+ years	Median Age
Kern	29.2%	60.7%	10.1%	31.0 years
California	23.3%	63.4%	13.3%	35.5 years
U.S.	22.9%	62.2%	14.9%	37.4 years

residents greater than age 65 years compared to California and the nation (Table 1). Similarly, the median age of Kern County residents in 2015 is noticeably younger than California and the nation. While a younger population may indicate a smaller burden for older adult services like Medicare or Social Security benefits and provides a larger base of workers for the future, it also means that more young people are depending on fewer adults for their current needs. Services for children, like Medi-Cal, public education and after school programs, free and reduced-priced meals, and childcare are likely in greater need in Kern County than other parts of the state.

Kern County has a larger proportion of family households, families with children less than 18 years of age, and single-parent families with children less

	Family Household	Families with Children < 18 years	Single-parent Families with Children < 18 years
Kern	75.5%	39.7%	14.5%
California	68.7%	31.9%	9.7%
U.S.	66.2%	28.8%	9.4%

than 18 years of age than California and the nation (Table 2). Strikingly, single fathers with children less than 18 years of age account for 4.3 percent of Kern County households, compared to only 2.7 percent of California households and 2.3 percent U.S. households. (6) Additionally, the average family size in Kern County is slightly larger than California and the nation at 3.2, 3.0, and 2.6 persons respectively. While family settings can offer many benefits, larger families, particularly those with children dependent on a single income, may be at high risk for poverty and associated barriers. Keeping in mind that Kern County has a larger proportion of single-

parent households compared to the state and nation; largerer family sizes often mean more dependent children rather than more adults.

As of 2015, Kern County has a much larger proportion of Hispanic residents than California and the nation (Table 3). While the proportion of White and Black residents in Kern County is similar to that of the rest of the state, the proportion of Asian residents in Kern County is significantly smaller than California. As the racial and ethnic composition of Kern County continues to change, it is important to create culturally sensitive systems, policies, and environments while protecting the health of the public.

Table 3: Ethnicity and Race

	Kern	California	U.S.
Hispanic	51.0%	38.4%	17.1%
Non-Hispanic White	36.6%	38.7%	62.3%
Non-Hispanic Black	5.3%	5.6%	12.3%
Non-Hispanic American Indian/Alaska Native	0.6%	0.4%	0.7%
Non-Hispanic Asian	4.4%	13.5%	2.1%
Non-Hispanic Native Hawaiian/Pacific Islander	0.1%	0.4%	0.2%
Non-Hispanic Other	0.1%	0.2%	0.2%
Non-Hispanic Two or More Races	1.9%	2.8%	2.2%

Spanish-language education, documents, and services will continue to be needed as the Hispanic population continues to grow. Additionally, while the total number of Non-Hispanic Asians in Kern County remains small, the proportion of residents identifying as Non-Hispanic Asian has increased 21 percent since 2009 (6). In comparison, during the same time frame, the Hispanic population in Kern County grew by 11 percent. Given the diversity of Asian languages, it is important to prepare for the needs of this growing community. Kern County may benefit by seeking out other California counties with large Asian populations to determine best practices. It is also important to recognize that residents of certain races or ethnicities may be at higher risk for certain medical conditions. For example, severe coccidioidomycosis, also known as valley fever, is more common in Blacks and Asians than Whites or Hispanics. Changes in the racial and ethnic background of Kern County residents may also change the incidence of certain diseases.

While Kern County has a smaller proportion of residents who are foreign born compared to California, it has a larger proportion than the nation as a whole (Table 4). (6) Of those who were foreign born, a much smaller proportion of Kern County residents became naturalized citizens than the state or nation. Further investigation is needed to determine if this is due to ineligibility, lack of desire to become a U.S. citizen, or an unmet need of resources or information. Non-citizen residents are ineligible for many government-provided safety net services, including subsidized medical insurance, and may therefore not receive necessary health care.

Table 4: Country of Birth and Naturalization

	Foreign Born	Naturalized Citizens
Kern	20.3%	32.4%
California	27.0%	48.5%
U.S.	13.2%	46.6%

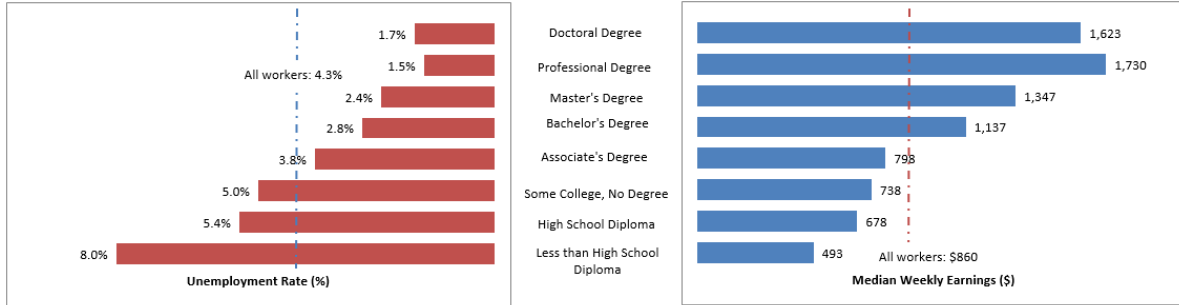
Education, Employment, and Income

Although there are many larger unified school districts in the state (which include elementary and secondary schools), the Kern High School District is the second largest stand-alone high school district in the state, serving 38,070 students in 2015-2016. (7) While there are many benefits to large school districts, such as lower overhead costs and more extracurricular activities, they do not necessarily mean higher academic achievement. Of the 32 high schools in Kern County, only eight were not designated for Program Improvement during the 2015-2016 school year, four of which were continuation schools. (8) Program Improvement determinations are based on Adequate Yearly Progress (AYP), which is an accountability measure used to determine if schools are meeting state standards. It should be noted that AYP has been discontinued by the California Department of Education so the 2015-2016 designations were carried into the 2016-2017 school year; a new accountability system is being developed for 2017-2018 school year. There is one California State University (CSU), and three community colleges located in Kern County, as well as dozens of vocational schools and distance learning campuses. Even so, Kern County continues to have a much smaller proportion of residents with a high school diploma or general education degree (GED) than California or the nation (Table 5). (6) Similarly, the proportion of Kern County residents with a Bachelor's degree or higher is half that of California and the nation. However, the California Department of Finance has forecasted the largest increase in high school graduates to be in Kern County by 2023. (10) It is interesting to note that two local community colleges are on the national list of two-year public institutions with the lowest tuition, suggesting that Associate's degree or other short-term training are both affordable and accessible in Kern County. (11) CSU Bakersfield is the 10th most expensive CSU campus (out of 22) for the 2016-2017 school year. (12) There is no University of California campus within 100 miles of the central Bakersfield area. This suggests that there may be geographical and financial obstacles to higher education for Kern County residents.

	Kern	California	U.S.
High School Diploma or GED	73.4%	81.8%	86.7%
Bachelor's Degree or Higher	15.4%	31.4%	29.8%

Education often influences employment opportunities and earnings. Nationally, workers with a Bachelor's degree earn more than twice as much as a worker with less than a high school diploma (Figure 1, next page). (13) A high school diploma or equivalent increases earnings by more than 25 percent on average. Similarly, workers without a high school diploma are nearly three times as likely to be unemployed, compared to workers with a Bachelor's degree. This is even more pronounced locally. In Kern County, workers with a Bachelor's degree earn more than three times as much as workers with less than a high school diploma; the unemployment rate among workers with less than a high school diploma is four times as high as workers with a Bachelor's degree or higher. (6) Just having a high school diploma or equivalent in Kern County increases earnings by one third and decreases the likelihood of being unemployed by nearly a quarter.

Figure 1: Earnings and Unemployment Rates by Educational Attainment



Source: Bureau of Labor and Statistics, Current Population Survey, 2015

In 2015, the proportion of Kern County residents who were unemployed was higher than California and the nation (Table

Table 4: Employment and Industry

	Unemployment	Agriculture	Manufacturing	Public Transit Commute
Kern	12.7%	16.7%	6.0%	1.1%
California	9.9%	2.4%	9.8%	5.2%
U.S.	8.3%	2.0%	10.4%	5.1%

6). (6) While unemployment is often the result of many factors, a smaller proportion of working adults affects both the number who need assistive services and the number who provide the support that maintains those services. Additionally, some Kern County communities face significantly higher unemployment rates; California City had an average unemployment rate of 20.3 percent in 2015. (14) With agriculture, forestry, fishing and hunting, and mining (which includes oil production) as a major industry in Kern County, seasonal unemployment can push rates even higher. While not unemployed, workers who are employed part time for economic reasons or are marginally attached workers, are considered underemployed. In 2016, California had the third highest underemployment rate in the nation with 11.3 percent of California workers un- or under employed. (15)

Compared to the state and the nation as a whole, agriculture and related occupations provide a large proportion of Kern County's jobs (Table 6). (6) In contrast, far fewer Kern County workers are employed in manufacturing compared to California and the U.S. Also of interest, a much smaller proportion of Kern County workers took public transportation to work compared to California and the nation. This may be, in part, due to large agriculture and oil production industries, which require workers to travel to remote locations, often at unconventional times. Public transportation agencies are often not able to provide services to these workers because of the variability of the work location. Moreover, private companies may also arrange carpooling or other transportation options for their employees, reducing the need for public transportation services. However, it is important to note that there are many workers in many other industries that could benefit from public transportations services and further analysis is needed to determine why public transportation is underutilized in Kern County.

The median household income in Kern County as of 2015 is lower than California and the nation; similarly the per capita income is far less (Table 7). (6) Granted, the cost of living in Kern County may be low relative to some other California counties; however, the

	Median Household Income	Per Capita Income	Families Below Poverty	Children Below Poverty
Kern	\$49,026	\$20,644	19.4%	34.1%
California	\$61,818	\$30,318	12.2%	23.8%
U.S.	\$53,889	\$28,930	11.3%	22.6%

cost of living in California is consistently higher than the nation as a whole. It would be expected that the income be at least comparable between Kern County and the U.S., but this is not the case. Not surprisingly, a larger proportion of Kern County families reported earned incomes below the federal poverty level compared to California and the U.S. This difference is even more pronounced in single-family homes with a female householder. In Kern County, 61.1 percent of families with a female household live below poverty, compared to only 45.2 percent of California families and 47.3 percent of U.S. families. However, even among Kern County families with two or more workers, 7.9 percent live below poverty. Poverty disproportionately affects Kern County children with more than a third living below poverty compared to less than a quarter of Californian children. In 2017, the Federal Poverty Level is set at \$24,600 for a family of four, just over \$2,000 per month. (16)

Housing

As of 2015, Kern County has a higher proportion of single-family homes compared to California and the nation. (6) Analogous with the housing boom that

	Median Home Value	35% or More of Income on Mortgage	35% or More of Income on Rent
Kern	\$167,400	26.9%	46.1%
California	\$385,500	33.7%	47.5%
U.S.	\$178,600	24.7%	42.7%

occurred in Kern County, a larger proportion of Kern County homes were built in 2000 or later compared to the state and nation. Despite this, the median home value in Kern County was far less than California and slightly less than the nation as a whole (Table 8). More importantly, the proportion of homeowners with a mortgage who spent more than 35 percent of their monthly income on their mortgage was higher in Kern County than the nation, but much lower compared to California. On the other hand, the proportion of renters who spent more than 35 percent of their monthly income on rent was similar across the board. In comparison to other areas in California and throughout the nation, Kern County housing seems cheaper and expansive; however, one must also take into account a much lower earned income and larger family size typical of Kern County residents. Housing can provide shelter, stability, and safety. However, poorly maintained residences can be a hazard to health. Poor indoor air quality can aggravate respiratory problems, old paint and plumbing systems can cause elevated lead levels in young children, lack of safety devices like handrails on stairs can contribute to slips and falls which can cause injury. Overcrowding in housing can facilitate the transmission of infectious disease like

influenza and tuberculosis. Those lacking financial resources are more likely to experience unsafe or unhealthy housing conditions; at the same time, the same group of people are less able to address any issues that may occur as a result of poor housing. Housing also extends beyond the physical house. The neighborhood in which the house is located can contribute to health. Nearby public parks may be well maintained or rundown, affecting the likelihood of physical activity. The neighborhood may be bordered with unhealthy fast food restaurants or grocery stores offering fresh produce, affecting the access to nutritious, affordable food. While housing is a necessity, in particular in Kern County where summer temperatures can remain above 100 degrees Fahrenheit for weeks, many aspects of housing can promote or detract from health.

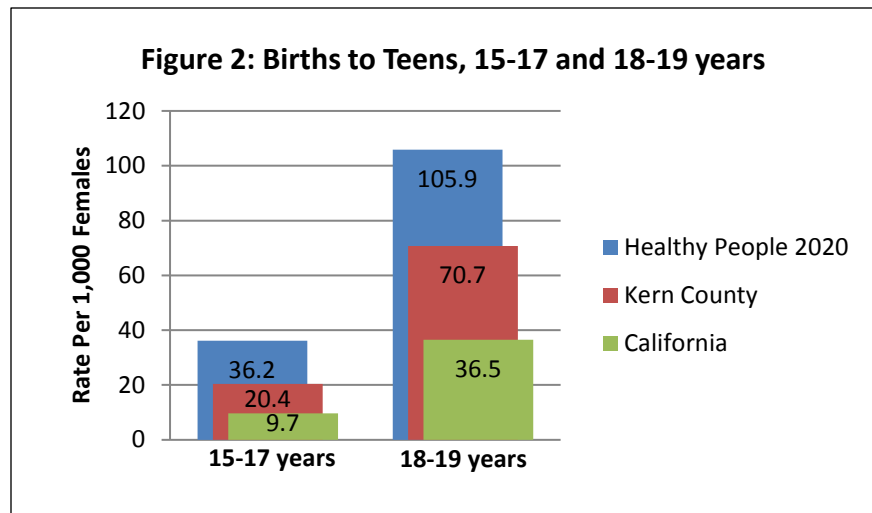
Section 2: Births

The County Health Officer is the local registrar for births in Kern County. The Kern County Public Health Services Department Office of Vital Records reviews records for all births which occur in Kern County before forwarding them to the State for processing. After being certified by the State, birth records are assigned to the county where the mother resides, which is not necessarily the county where the birth takes place. Thus, reported birth statistics encompass births to Kern County women and exclude births to women who are not Kern County residents.

Information about births and related factors are vital to understanding maternal and child health as well as planning and assessing healthcare services. The number of births has a substantial impact on population growth or decline. In recent years, Kern County has seen a decline in the number of births while the overall population continues to grow, lowering the birthrate. While the rate of births in Kern County is higher than California as a whole, a similar declining trend has been seen state- and nationwide. A decline in births may be the result of many things, including family planning, economic pressures, and normal fluctuation. Important birth indicators include births to teens, early entrance to prenatal care, preterm births, and low birth weight. In general, while Kern County meets the Healthy People 2020 target for most birth indicators, it trails behind the statewide averages.

Births to Teens

The Healthy People 2020 National Objective defines birth to teens by the number of pregnancies that occur in a population. Since pregnancy alone may not be accurately counted due to underreported miscarriage, elective abortion, and still births, the number of live births is used in lieu of the number of pregnancies in

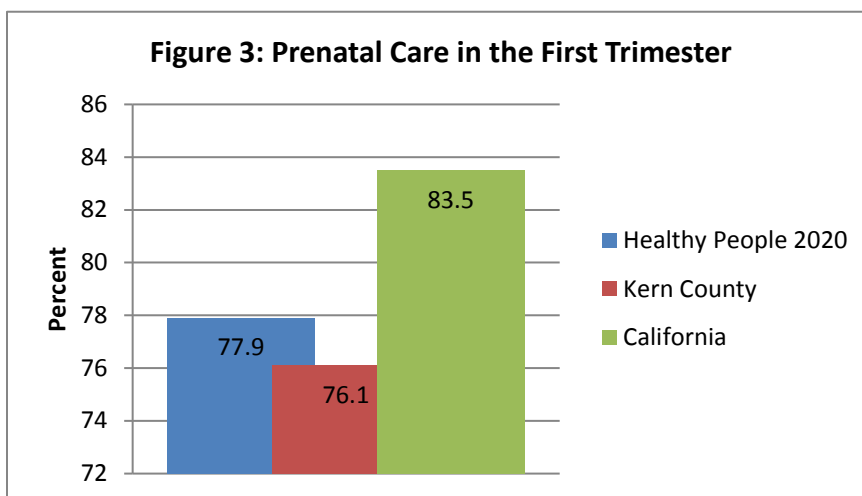


the state of California. Childbearing during adolescence increases the likelihood of dropping out of high school, needing public assistance, and living in poverty. (17) While most studies focus on teenage mothers, there are similar effects for teenage fathers who are more likely to drop out of high school and earn less than older fathers. In addition, there are far fewer resources for teen fathers compared to teen mothers. Being born to a teenage mother increases the likelihood of poor health outcomes in the baby, such as preterm birth, low birth weight, or other pregnancy complications. Additionally, having teen parents increases the likelihood a child will grow up in

poverty. In some cases, adult grandparents provide support for the family; adult grandparents may even assume responsibility as the primary caregiver, but this can create an additional burden on the grandparents. In 2014, the teen birth rate reached historic lows nationally. (18) Following this trend, the teen birth rate in Kern County continued to decline and met the Healthy People 2020 target in both age groups; however, the Kern County teen birth rate is still double the rate of births to California teens (19) ranking Kern County the worst out of 58 California counties in a 2016 report (Figure 2, previous page). (20) While education, access to effective contraception, and pregnancy planning may have reduced teen birth rates in recent years, it is important for Kern County to continue developing methods to decrease teen birth rates to reach the much lower California rate.

Prenatal Care

Prenatal care is the healthcare a woman receives during her pregnancy to help ensure that the pregnancy and delivery are as safe as possible for mother and baby. Women who receive prenatal care early tend to have fewer pregnancy complications and deliver healthier

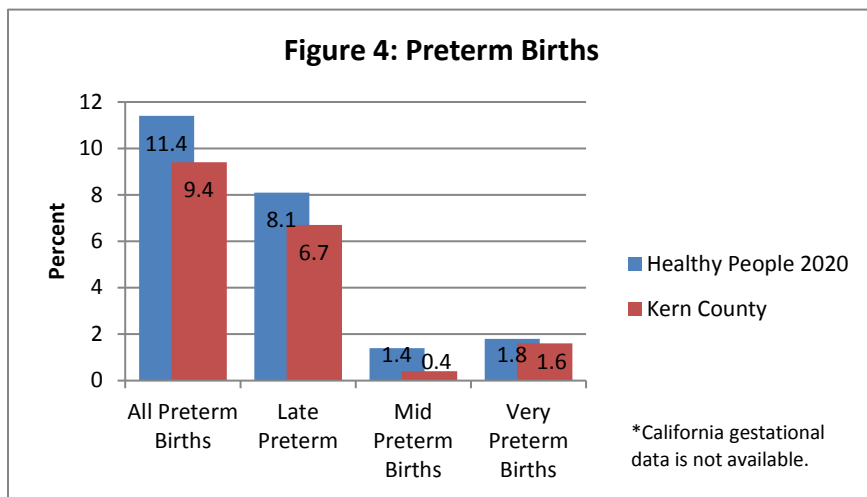


babies. Prenatal care should be received as soon as possible or at least within the first trimester of pregnancy. Unfortunately, Kern County continues to fall short of the Healthy People 2020 target for timely prenatal care; meanwhile, California consistently exceeds the target (Figure 3). This indicates a need for more emphasis on early prenatal care in Kern County. Kern County is ranked 36 out of 58 California counties for prenatal care received in the first trimester. (20) While Kern’s ranking has improved, Healthy People 2020 goals are still not being met. Early prenatal care promotes better health for both mother and child, allowing early intervention where needed. Women who receive late or no prenatal care may have other barriers to accessing the healthcare system such as substance abuse, poverty, age, lack of transportation, or cultural and language barriers. Targeting and eliminating these and other barriers to accessing timely and quality care must be a priority to continue improving maternal and child health. Unplanned pregnancies may also contribute to late entry into prenatal care; if unaware of pregnancy, care cannot be sought. For most women, lack of health insurance should not be a barrier to care. In addition to a multitude of low-cost options, pregnant women usually qualify for presumptive eligibility for Medi-Cal coverage. This enables low-income women to receive prenatal care and pregnancy-related prescription drug coverage on a temporary basis. Presumptive eligibility does

not cover labor and delivery so eligibility requirements for basic Medi-Cal must still be met for continued coverage, but presumptive eligibility allows women to bypass the Medi-Cal waiting period while eligibility is assessed and facilitates entry into early prenatal care.

Preterm Births

Preterm births are defined as any birth occurring before 37 gestational weeks. Late preterm births are defined as births between 34 and 36 gestational weeks, mid preterm births are between 32 and 33 gestational weeks, and very preterm births are defined as any birth occurring at less than

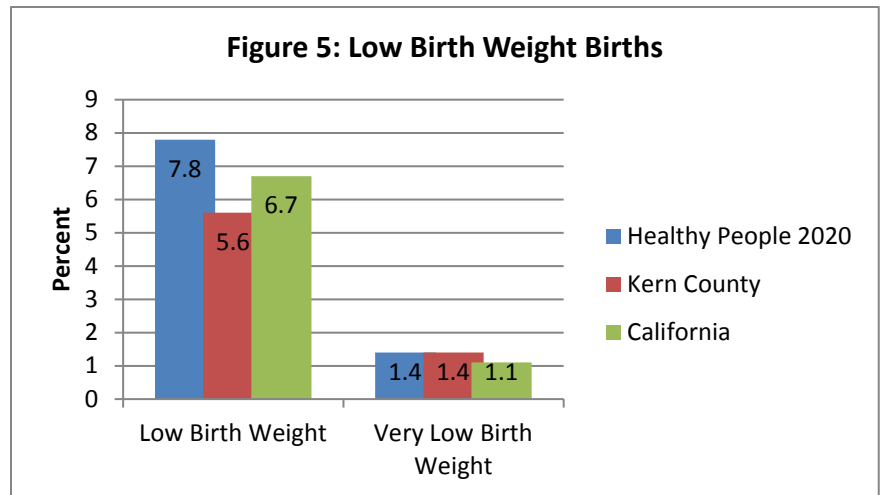


32 gestational weeks. Gestational weeks are usually calculated based on the mother’s last menstrual cycle which can be subject to some errors in recall. However, gestational age may also be adjusted if measurements taken during routine ultrasounds differ significantly from what is expected based on the date calculation. All preterm births require additional medical care and some preterm births result in life-long health issues. In 2014, Kern County met all of the Healthy People 2020 targets regarding preterm birth (Figure 4). [California data by gestational age are not available.] However, further reducing the number of preterm births should continue to be a priority as preterm birth is one of the primary causes of low birth weight and infant mortality. Preterm births can also be affected by early induction of labor or cesarean delivery. Unless medically indicated, it is not recommended to schedule these procedures until at least 39 weeks of gestation. Another common cause of preterm birth is multiples (twins, triplets, etc). While this can be a spontaneous and unpredictable natural occurrence, increased use of fertility treatments likely contribute to the increased number of multiples seen nationwide. Timely and consistent prenatal care can help prolong pregnancy to allow multiples to develop as much as possible before birth and reduce some of the complications related to preterm birth.

It should be noted that infants born after 42 weeks gestation are considered post-term. While there are health risks associated with post-term births, including malnutrition and possible fetal death, most healthcare providers will intervene and induce labor prior to 42 weeks gestation. Since gestational age is subject to recall bias, many post-term births are thought to be mistakes in calculating the gestational age rather than a true post-term birth.

Low Birth Weight

Infants born weighing less than 2,500 grams (approximately 5.5 pounds) are considered low birth weight. (21) Very low birth weight encompasses infants weighing less than 1,500 grams (about 3.3 pounds) at birth. [The World Health Organization



defines extremely low birth weight as less than 1,000 grams, but most American research has been based on the 1,500 gram cut off.] The two main causes of low birth weight are premature birth and intrauterine growth restriction. Intrauterine growth restriction may be the result of genetic, metabolic, or environmental influences. Underlying medical conditions in the mother, tobacco use, and birth defects can all slow growth. While some low birth weight infants may be born full-term and completely healthy despite being small, in general, low birth weight is an indicator of poorer infant health. Kern County met the Healthy People 2020 targets for both low birth weight and very low birth weight births in 2014 (Figure 5). Additionally, Kern County fares better than the California average regarding low birth weight, but there is work to be done to improve very low birth weight proportions in relation to the Healthy People 2020 objectives. Kern County is ranked 45 out of 58 California counties for low birth weight births, when the years through 2012 and 2014 are averaged. (20) While it is difficult to predict birth weight in utero, timely and consistent prenatal care can monitor fetal growth. Additionally, since low birth weight is often linked to preterm delivery, reducing preterm births should have a corresponding effect on low birth weight births.

Section 3: Deaths

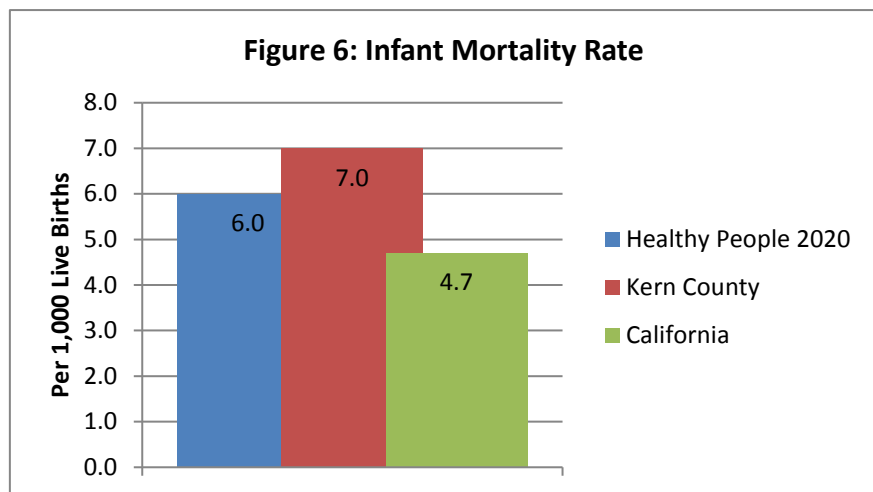
Understanding mortality rates is the first step in reducing premature mortality and prolonging a high quality of life. Developing policies and services that might prevent certain types of causes of death can reduce the overall death rate. Age-adjusted mortality rates account for not only the size of the population, but the age of the population. A population with older individuals is likely to have more deaths than a population of young individuals, particularly when examining common chronic diseases. Recognizing that Kern County has a proportionately younger population than both California and the nation, one would expect to see a smaller mortality rate; however, this is often not the case.

Historically, communicable diseases were the most common causes of death in the U.S. As medical care and public health interventions have progressed to both prevent and treat infectious agents, death from communicable diseases has reduced dramatically. This, of course, resulted in an increasing number of deaths due to chronic diseases. Coronary heart disease and cancer account for more than third of all deaths in Kern County. (22) In comparison, influenza and pneumonia caused only 1.6 percent of deaths.

While the leading causes of death to Kern County residents have remained relatively constant, one notable factor is the recent change in the most common cause of death. Since 1994, coronary heart disease has been the most common cause of death in Kern County. In 2008, the number of deaths due to coronary heart diseases dipped below that of cancer. Since both coronary heart disease and cancer mortality have declined during the overall time period, this is not an artifact of increasing cancer rates; rather it is a demonstration of how far the reduction in coronary heart disease deaths has come. Credit should be given to programs and interventions that promote healthy heart living. As well as decreasing in total deaths, the age-adjusted mortality rate for coronary heart disease has also declined below cancer, indicating that fewer people are dying prematurely due to coronary heart disease. Thus, decreasing mortality is two-fold: decreasing the total number of deaths in a population and decreasing premature mortality to extend length of life.

Infant Mortality

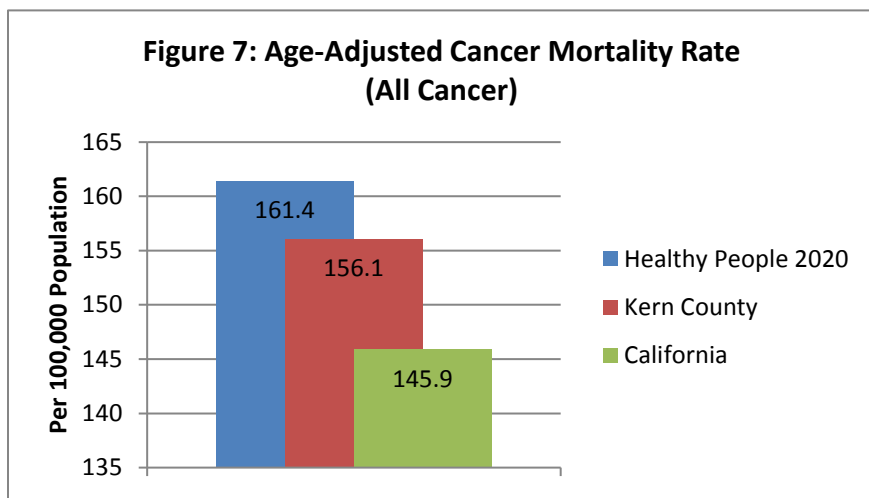
Infant mortality is defined as any death in a person less than one year of age. In 2013, Kern County did not meet the Healthy People 2020 target for infant mortality, and fell far short of the statewide average (Figure 6). In 2013, there



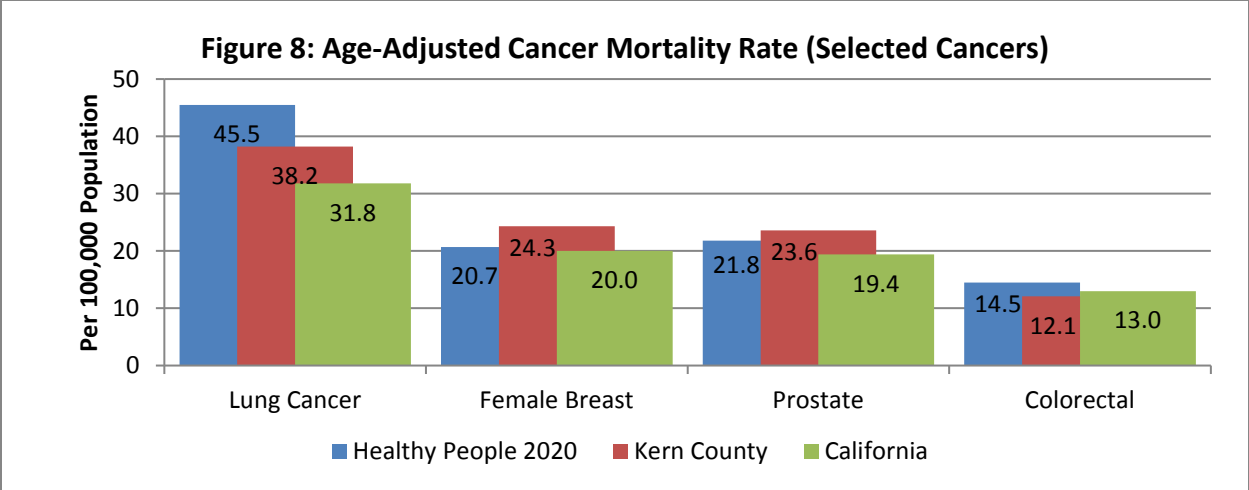
were 99 deaths of Kern County children under the age of one year. (23) A vast majority of infant deaths in 2013 were due to medical conditions present at birth, while some were due to unforeseeable incidents. Clearly, some infant deaths are unavoidable; however, some are preventable and others might be circumvented with risk reduction measures. Nearly one third of infant deaths (31.3 percent) were related in some way to preterm birth. As such, reducing the rate of preterm birth alone could have a substantial impact on infant mortality. Each infant death, regardless of cause, is a tragedy and can have severe repercussions on the family. Any reduction in infant mortality is an achievement.

Cancer Deaths

Since 2008, cancer has been the most common cause of death in Kern County residents, outnumbering heart disease. Cancer is not a single disease, but a general term used to describe a collection of diseases each with its own clinical presentation, survival rate, and risk

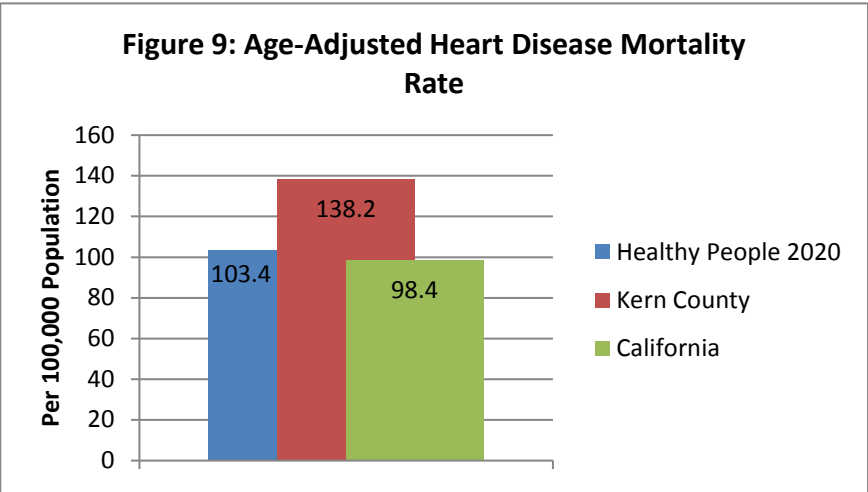


factors. The most common types of cancer mortality in Kern County residents are lung and bronchus, female breast, prostate, and colon and rectum. In 2013, the age-adjusted mortality rate for cancer in Kern County met the Healthy People 2020 target, but was still higher than California as a whole (Figure 7). The same pattern was seen in lung cancer. In female breast cancer and prostate cancer, Kern County met the Healthy People 2020 target; however, there is still improvement needed to meet the lower age-adjusted statewide average. Colorectal cancer mortality rates met the Healthy People 2020 goals and were lower than the statewide average (Figure 8, next page). It should be noted that breast cancer can both occur and cause mortality in men; however, rates are adjusted to the female-only population because the vast majority of breast cancer cases occur in women. While the overall Healthy People 2020 target for cancer was met, it is important to remember that cancer is still the most common cause of death in Kern County and it remains important to take steps to reduce cancer incidence. Kern County ranked 39 out of 58 in all cancer deaths, 42 out of 58 in lung cancer deaths, 47 out of 58 in female breast cancer deaths, 43 out of 58 in prostate cancer deaths, and 32 out of 58 in colorectal cancer deaths. (20)



Heart Disease Deaths

For decades, heart disease was the leading cause of death in Kern County. Great strides have been taken to reduce heart disease in Kern County, reflected by a continuing decrease in the age-adjusted heart disease mortality rate. Heart disease can cause sudden death with a heart attack or

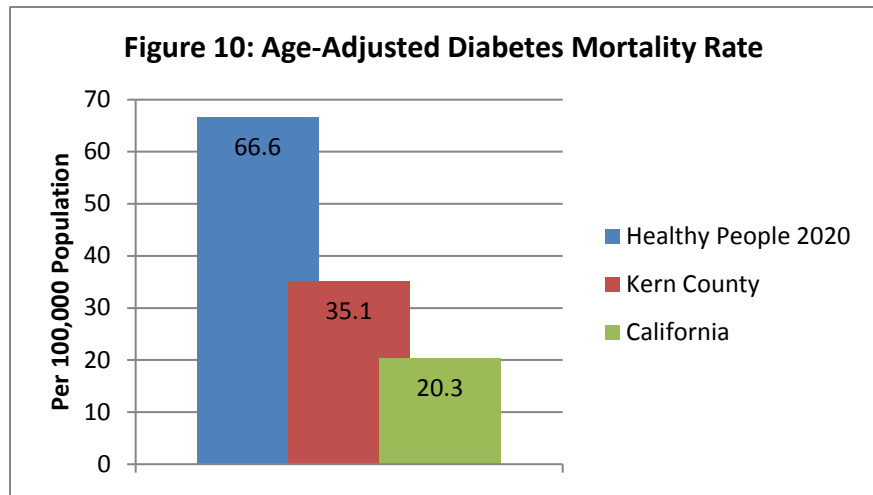


exist as a chronic condition that weakens the heart until it fails completely. While Kern County failed to meet the Healthy People 2020 target in 2013, California as a whole did (Figure 10). (22) Kern County ranks 56 out of 58 California counties in heart disease death. (20) Until 2009, Kern County had consistently ranked 58 out of 58 counties. While some counties that now have higher heart disease mortality than Kern County have seen increases in their heart disease death rates, others have continued to decrease. This indicates that Kern County has decreased its rate of heart disease mortality dramatically. Indeed, the age-adjusted mortality rate for heart disease among Kern County residents has been cut in half since 1998, thanks to local, regional, and national efforts. It is important not to lose sight of the progress that has been made and to continue the trend of reducing heart disease mortality in Kern County.

Diabetes Deaths

Diabetes is a condition which occurs when the body cannot produce enough insulin to complement the circulating levels of blood glucose, or the body does not respond well to insulin despite producing sufficient levels. Unmanaged diabetes can have severe complications,

including blindness, poor circulation and nerve damage that results in amputation, kidney failure, hearing loss, stroke, and coma. People with diabetes are more susceptible to infections and have a poorer prognosis when ill. While Kern County and California met the Healthy People 2020 target, Kern County has a much higher rate than California (Figure 10). (22) It should be noted that Healthy People 2020 includes all deaths that were related to diabetes while Kern County and California only count the deaths in which diabetes is the primary cause. Diabetes is the sixth leading cause of death in Kern County; however, Kern County is ranked worst in the state for diabetes deaths. (20) Diabetes deaths have continued to increase in Kern County, despite decreasing overall mortality. It is difficult to know if this reflects an increase in the number of deaths due to diabetes or if the data is being captured more consistently.



Section 4: Communicable Disease

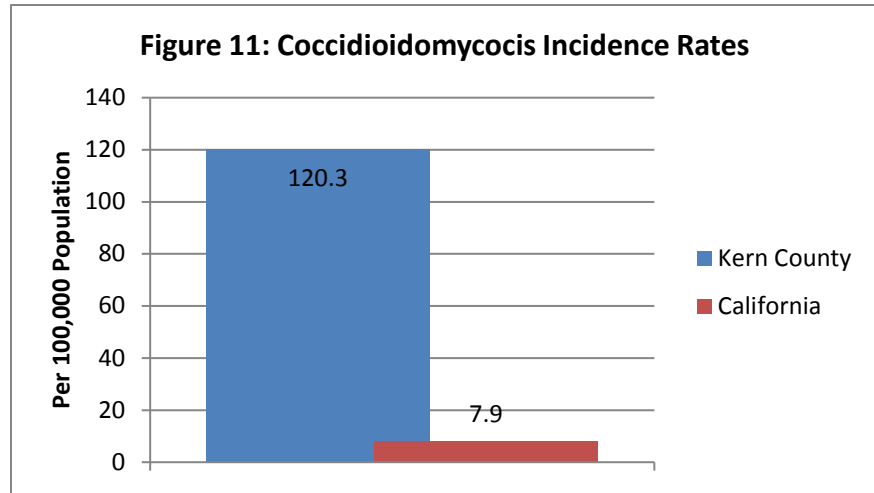
Communicable disease includes any illness in humans which results from pathogenic infection, such as bacteria, fungi, parasites, and viruses. This can include person-to-person transmission, animal-to-person transmission, insect-to-human transmission, and direct contact with fungi and parasites. Communicable disease can range from mild, like the common cold, to nearly always fatal, such as rabies infection. A single condition can also vary in outcome; influenza may cause mild respiratory symptoms in some patients but can progress to pneumonia and death in others.

Control of communicable disease has been one of the highest achievements in public health. In 1900, the leading causes of death across the U.S. included pneumonia and influenza; tuberculosis; diarrhea, enteritis, and ulceration of the intestines; and diphtheria. While pneumonia and influenza are still a leading cause of death more than 100 years later, preventative measures such as the influenza and pneumococcal vaccine have helped prevent many infections and decreased the severity of disease. Antibiotic therapy, case management, and contact tracing has reduced tuberculosis to primarily an imported disease. Even as antibiotic resistance has developed in the disease, improved laboratory techniques has allowed for individually-tailored regimens to combat tuberculosis. Improved sanitation and hygiene has reduced enteric diseases from routine, persistent outbreaks to individual incidents with an occasional cluster of cases. Diphtheria has all but been eliminated in the U.S. due to childhood vaccinations. Other familiar names like measles, mumps, rubella, polio, and tetanus are known only by the immunizations people receive to protect them; very few born after the development of the vaccine have ever experienced those diseases.

A number of communicable and infectious diseases are required by law to be reported to the health department by medical providers and clinical laboratories, as is any unusual disease or outbreak situation. For many of these conditions, public health intervention can reduce or prevent ongoing transmission, making reporting a vital step in disease control. While most reportable conditions rarely cause immediate death in developed countries, they can certainly cause lack of productivity, high medical bills, or other disruptions to everyday life; monitoring morbidity is important to track the burden of disease. Additionally, intervention may be needed to avoid further transmission of disease to others. Public health is in charge of designing systems and policies to minimize disease transmission as well as oversee prophylactic treatment when necessary. Since communicable disease does not stop at the county or state border, there are multiple instances each year where Kern County must work with other jurisdictions to investigate diseases. Some of the most commonly reported diseases in Kern County are sexually transmitted infections, foodborne illnesses, and coccidioidomycosis.

Coccidioidomycosis

Coccidioidomycosis, commonly known as valley fever, is a disease of special significance in Kern County. While it is endemic to much of the southwestern United States, nearly half of all reported California cases occur in Kern County residents. In 2015, Kern County had nearly four



times more cases than any other county in the state. (24) Taking into consideration the population of Kern County, the rate of coccidioidomycosis is more than 15 times that of California as a whole (Figure 11). While coccidioidomycosis is prevalent throughout the entire San Joaquin Valley, even other valley counties do not have nearly as many cases as Kern County. To help spread awareness, answer questions about the disease, and provide analytical data, Kern County has its own website dedicated exclusively to Valley Fever in Kern County (www.KernCountyValleyFever.com).

While most people exposed to the fungus that causes valley fever, *coccidioides immitis*, have mild or no symptoms, a small proportion develop severe disease which may require life-long treatment and can result in death. Unfortunately, predicting where the *coccidioides immitis* fungus might grow has been notoriously difficult so preventing exposure can only be done in a general sense. Since case counts are determined by the patient's county of residence, numbers do not include people who may have been exposed in Kern County through work or play but live in another area. Given that coccidioidomycosis is a regional disease, there are many instances where a patient is infected but does not become symptomatic until returning home to a non-endemic area. Although the infection can be diagnosed by a routine blood test, providers unfamiliar with the clinical presentation of the disease often misdiagnose patients with bacterial pneumonia or other infectious process. Failure to receive antifungal treatment can enable the infection to progress to more severe symptoms and possible debilitation. While Kern County has historically been on the leading edge of coccidioidomycosis treatment, additional research is needed to continue effectively treating patients. Moreover, research continues to be needed to help identify high risk areas and take steps to reduce exposure to the fungus.

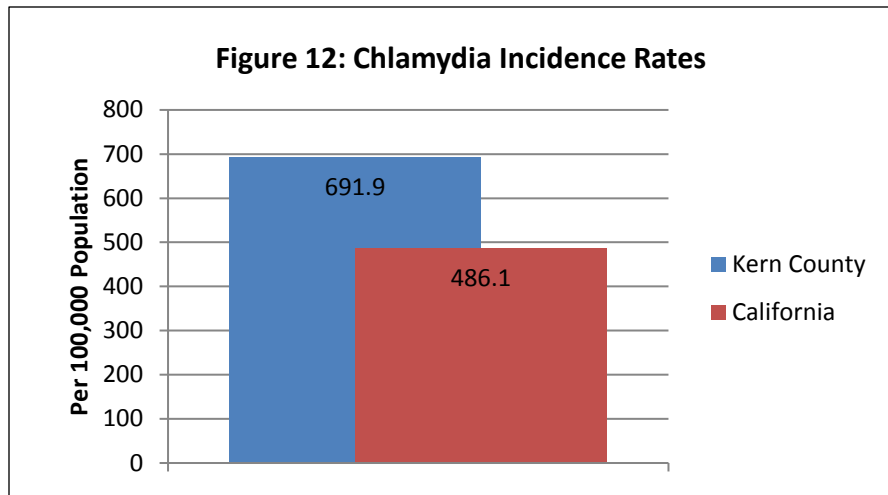
Sexually Transmitted Infections

Sexually transmitted infections (STI) continue to be some of the most commonly reported diseases in Kern County. While STIs can infect people of any age, the greatest concern is among those of childbearing age. STIs can affect fertility in both men and women, and can also be passed to newborns during childbirth. While many STIs, including the most common, are curable with antibiotics, medication cannot reverse damage that has already been caused by infection. Scar tissue, infertility, or a host of neurologic symptoms are just some complications that can be caused by chlamydia, gonorrhea, and syphilis. Additionally, if partners are not also treated, reinfection can occur, which increases the risk of complications.

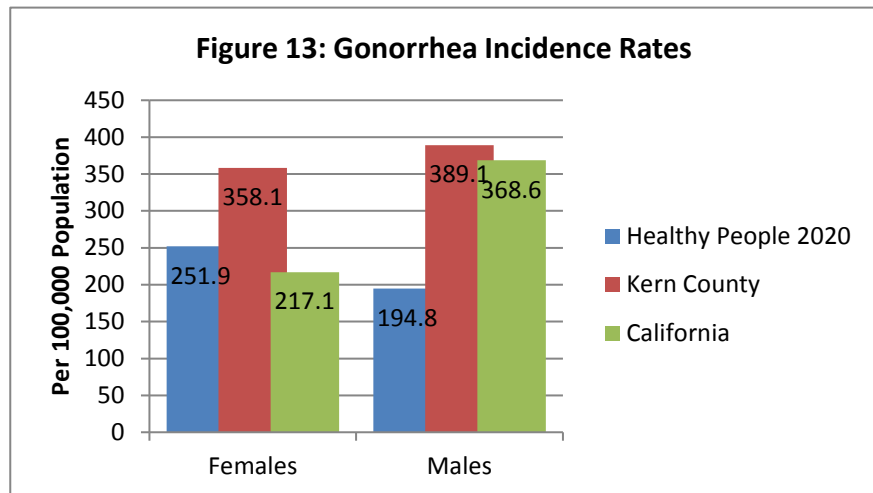
The Healthy People 2020 objectives for chlamydia seek to lower the proportion of women attending family planning clinics with chlamydia infections.

Unfortunately, the national STI surveillance system which collects such data is no longer available at the local

level. Other objectives for chlamydia are under development, but no targets have been set. Regardless of any national targets, the rate of chlamydia infection in Kern County far exceeds that of the state (Figure 12). Indeed, Kern County has been one of the worst counties for chlamydia since 2000, and continues to be ranked 58 out of 58 counties. (20)



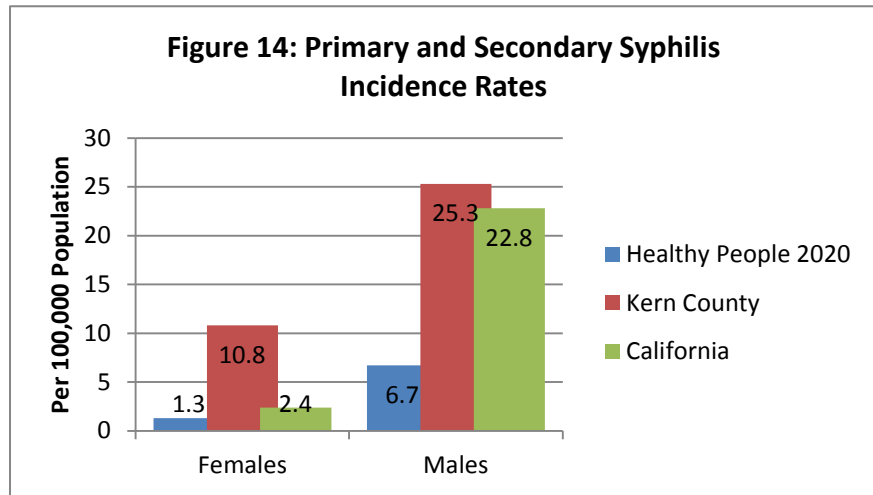
The Healthy People 2020 target for gonorrhea is further broken down by sex as women have a higher rate of infection nationwide. The rate of gonorrhea among women aged 15 to 44 years in Kern County fails to meet the Healthy People 2020 target and is much higher than the state average which does



meet the national target (Figure 13). Kern County is ranked 56 out of 58 counties for gonorrhea

among women. (20) On the other hand, the rate of gonorrhea among men aged 15 to 44 years far exceeds the Healthy People 2020 target, as well as the California average. It should be noted, that gonorrhea is more common in men throughout California, which differs from the national categorization. Kern County ranked 56 out of 58 counties for gonorrhea among males. (20) Like chlamydia, rates of gonorrhea have continued to increase in Kern County.

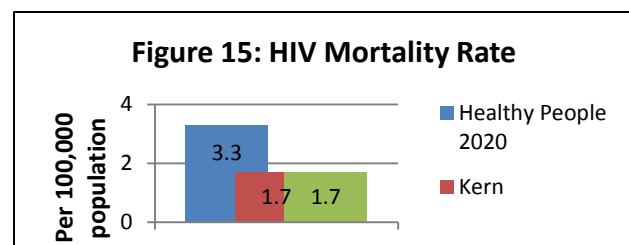
The rate of primary and secondary syphilis in Kern County is significantly higher than the national target as well. The increase in syphilis is a recent development which warrants special attention, particularly among women (Figure 14). While Kern County has a very high rate of syphilis among men, so



does the rest of the state. Unfortunately, the rate among Kern County females is significantly higher than state average, and far exceeds the Health People 2020 target. The increase in syphilis cases is especially concerning after more than a decade of relatively low rates. In 2015, there were 5 times as many primary and secondary syphilis cases when compared to 2010, and the rate has been steadily increasing. (25) Additionally, many syphilis cases are not diagnosed until years after infection. Latent cases are no longer symptomatic themselves and may not present with any additional symptoms until decades later, but cases in the late stage of syphilis may suffer from paralysis, numbness, blindness, dementia, and death. While there are far more cases of chlamydia and gonorrhea than syphilis, the sharp increase in syphilis cases is of great concern.

HIV/AIDS

While HIV/AIDS is by definition a sexually transmitted infection, it is often placed in its own category. Special safeguarding of HIV/AIDS information is the result of historically poor treatment of HIV/AIDS patients and stigma associated with infection. Additional measures in case counting and disease management are also afforded HIV/AIDS cases. Whereas most diseases are investigated by individual counties with little inter-jurisdictional communication, great care is taken to follow up with HIV/AIDS patients who move to another county. While there are more than 122,000 current HIV/AIDS cases in California, fewer than 2 percent of those cases were reported in



Kern County. (26) Due to the sensitive nature of HIV/AIDS diagnoses, data regarding HIV/AIDS cases is often restricted to large sets of aggregate data to reduce the risk of identifying individual patients. In 2015, there were 122 newly diagnosed HIV infections cases in Kern County. (27) About a quarter of those cases had already progressed

Table 9: HIV/AIDS Needs

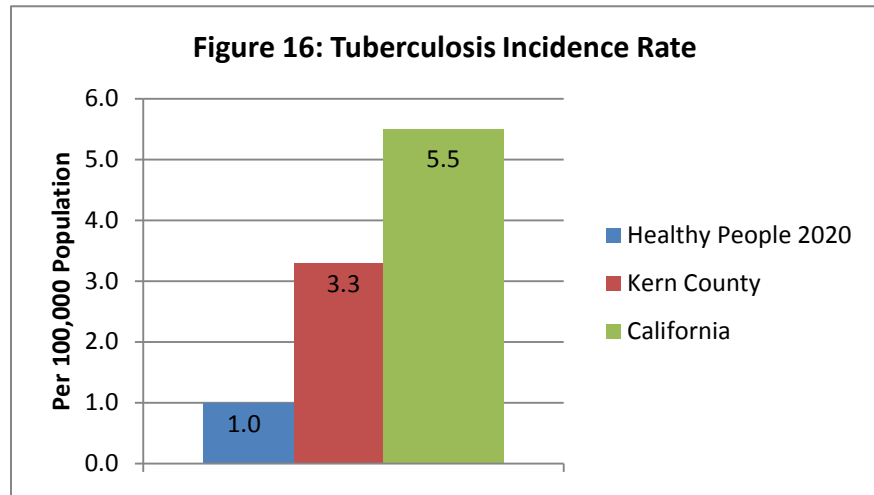
Service Category	Needs service	Needs met
Outpatient healthcare	71%	86%
Dental care	56%	78%
Food Services, vouchers, nutrition education	44%	83%
Housing services	36%	84%
Medication payment assistance	32%	61%
Mental health services	29%	86%
Substance use services	20%	79%
Home health care/ professional support in home	16%	75%
Hospice	6%	33%
Alternative healthcare	5%	40%

to AIDS at diagnosis. As advancements in treatment has become more available prolonging life, the prevalence of HIV/AIDS continues to increase while the incidence remains relatively stable. In 2013, Kern County and the state both exceeded the Healthy People 2020 HIV mortality rate goal of less than 3.3 deaths per 100,000 population with 1.7 deaths per 100,000 population for both the county and state (Figure 15). (28) In a 2011 assessment of the needs of HIV/AIDS cases, of the most commonly needed services, a high proportion of those clients had their needs met. (27) For example, 71 percent of patients reported needing outpatient healthcare, and of those, 86 percent indicated that their needs were met (Table 9). Unfortunately, services that were not often as needed were less likely to be provided, meaning clients who needed those services were less likely to have their needs met. For example, only 6 percent of patients reported needing hospice care; of those, only one third actually received the service. While it is commendable that the vast majority of service needs are being met, and since this assessment was performed, a great deal of outreach has been implemented, it is important to continue to provide support for the less common needs of some of our most vulnerable patients as well.

The most commonly reported risk factor among Kern County HIV/AIDS patients is sexual contact with an infected partner, followed by injection drug use. Consistent and correct barrier use can reduce the risk of all sexually transmitted infections. Condoms are free and available at many low-cost clinics throughout the county. Additionally, the Condom Access Project enables Kern County residents to request a specified number of free condoms discretely through the mail. Reducing exposure from injection drug use may be more difficult. The population in and of itself is more obscure so education campaigns and harm reduction strategies may have limited success. There are no certified needle exchange programs or pharmacies participating in the nonprescription sale of syringes in Kern County, limiting access to safe needles.

Tuberculosis

While tuberculosis is relatively rare in the United States, it continues to be one of the deadliest infectious diseases worldwide. (29) Many of the local cases of tuberculosis are imported from outside the U.S., but domestic transmission has also been documented, including person-to-person



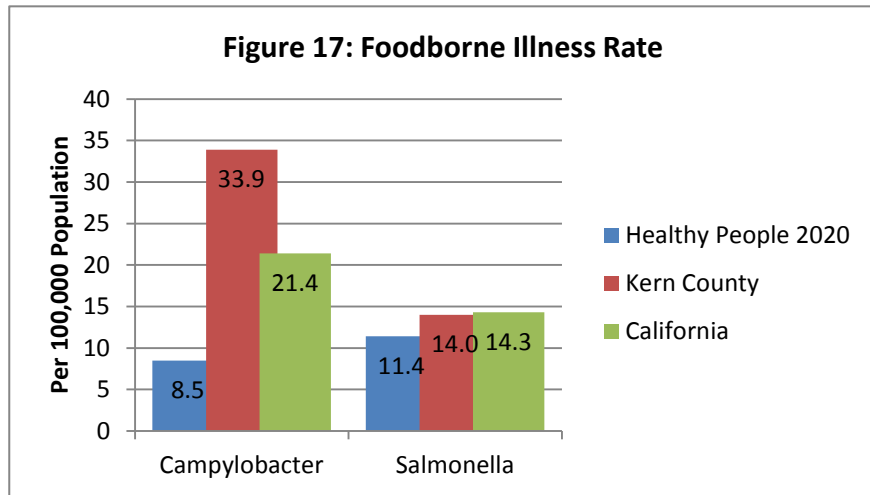
transmission in Kern County. Given that California is a border state, it is not surprising that neither Kern County nor the State met the Healthy People 2020 target in 2015 (Figure 16). It is also not surprising that the rate among Kern County residents is lower than California as a whole; counties that serve as major international hubs like Los Angeles County and San Francisco County as well as those that border Mexico are more likely to be home to immigrants that may have been infected with tuberculosis in their country of origin. However, Kern County does have a large Hispanic population as well as a concentrated Filipino population, many of which who regularly travel abroad to countries where tuberculosis is endemic. Additionally, tuberculosis can be easily transmitted in congregate living settings like prisons. Since Kern County includes four state prisons, two federal prisons, and several other correctional facilities, tuberculosis control and prevention remains extremely important.

Foodborne Illness

Foodborne illnesses are any infections that result from consuming foods or drinking liquids that contain certain pathogens. They can also be passed person-to-person through inadequate hand washing or contaminated swimming water. Most foodborne illnesses are caused by bacteria, viruses, and parasites, but some can be caused by toxins such as those found in naturally poisonous mushrooms or certain reef fish. The latter group is more often referred to as food poisoning or food intoxication and is relatively rare. The most common reportable foodborne illnesses in the United States are salmonellosis, campylobacteriosis, shigellosis, and hepatitis A. Due to large vaccination campaigns, hepatitis A is much less common in Kern County than two decades ago. Foodborne illness is of particular concern due to the vast agricultural industry in Kern County. Foodborne outbreaks can bankrupt businesses in addition to causing illness. Foodborne illness is often subject to a great deal of fluctuation due to local, regional, and national outbreaks. Better disease detection and laboratory identification enables cases across the country to be linked and increases the potential to identify sources of infection. Foodborne

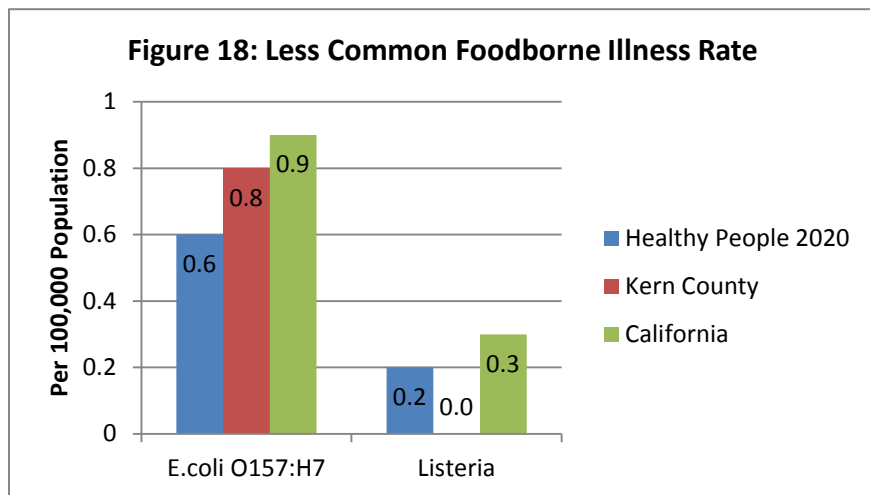
illness is also severely underreported as most people typically do not have severe enough symptoms to warrant medical attention.

While some foodborne illnesses have national objectives, others do not. In 2015, the incidence rate of campylobacteriosis among Kern County residents was higher than the rate among all Californians, and over four times the national target (Figure 17). While this only captures one year,



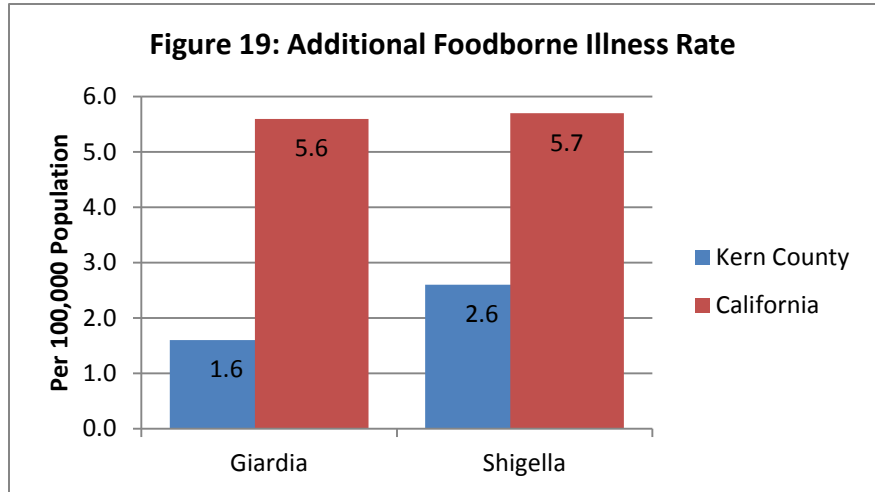
campylobacteriosis has been on the rise in Kern County for several years. The rate of salmonellosis in 2015 in Kern County was slightly lower than the state average; however, it did not meet the Healthy People 2020 target.

In comparison, Listeria and E.coli O157:H7 infections are not common foodborne illness with fewer than one case per 100,000 population in 2015. However, both conditions can have severe complications including miscarriage (listeria) and hemolytic uremic syndrome (E.coli



O157:H7) which makes them important to track. Preventing transmission of these bacteria can be life-saving. E.coli O157:H7 was the cause of one of the first large scale nationwide outbreaks in ground beef in 1993. The 2011 listeria outbreak was the deadliest foodborne disease outbreak in the United States in recent history. While these are relatively uncommon spontaneous illness, nationwide outbreaks can certainly increase the incidence rate in any given year. Kern County fares better than the state regard E.coli O157:H7 incidence rates, however improvements remain to be made to meet the Healthy People 2020 target. While there were no cases of listeria reported in Kern County in 2015, there have been cases in other years (Figure 18).

Currently, there are no national targets for reducing giardia and shigella transmission; however they remain important diseases to monitor. In 2015, Kern County had lower rates of both giardia and shigella compared to the California average (Figure 19). Giardia is a parasite that is



found in the environment and can be carried by many animals including wildlife and domestic pets. Shigella, on the other hand, is a bacterium that is only passed person to person. While other foodborne illnesses may be naturally occurring in the environment or in animal hosts, shigella resides only in human so food and water must be directly contaminated by an infected person. As such, interventions to reduce transmission are largely successful.

Foodborne illness is still one of the leading causes of mortality and morbidity worldwide. Domestically, improved sanitation, measures to protect the food supply, ready access to clean water, and disease investigation has reduced foodborne illness transmission to a handful of sporadic cases and the occasional outbreak, a major success for public health in the U.S.

Section 5: Chronic Disease

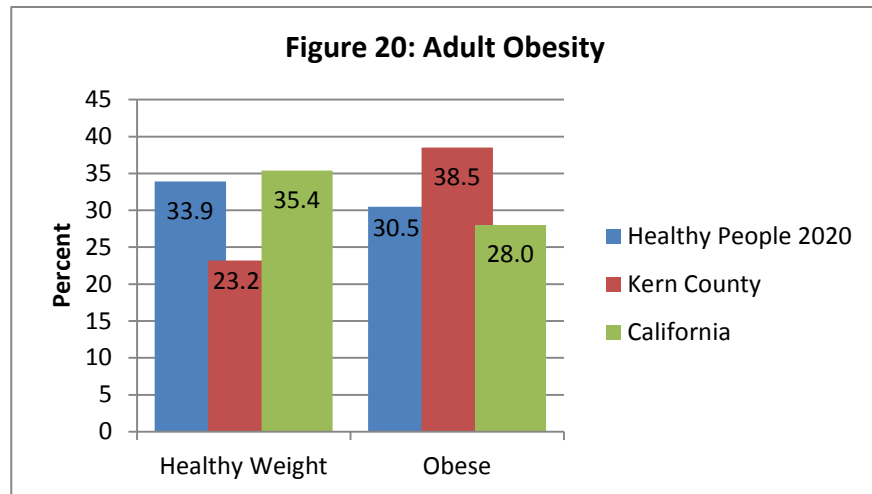
Around the mid-1900s, it was recognized that chronic disease, rather than communicable illness, had become the cause of most mortality in the United States. Great strides had been taken to reduce communicable disease and the impact was clear; vaccination and sanitation put an immediate stop to transmission. As the burden of communicable disease decreased, chronic disease morbidity and mortality increased. While some chronic diseases are common causes of death, others can cause a loss of productivity or quality of life without causing fatalities. Most chronic diseases data comes from death certificates or specialized registries. Unfortunately, data repositories for the vast majority of chronic diseases do not currently exist. Most data is pieced together through surveys collected at the state and local level making it difficult to compare across jurisdictions. However, extraction from electronic medical records has made some data analysis possible; most other data relies on self-reports from patients. A small snapshot regarding just a few common chronic diseases affected Kern County can be found below (Table 10). The proportion of population diagnosed relies on self-reports (30) while the hospitalization data is extracted from electronic medical records (31).

	Proportion of Population Diagnosed	Total Number of Hospitalizations	Mean Length of Hospital Stay	Mean Cost of Hospital Stay
Heart Disease	7.3%	4,763	5.6 days	\$92,092
Cancer	8.1%	1,893	6.8 days	\$117,845
Hypertension	31.7%	238	10.3 days	\$52,803
Obesity	38.5%	488	1.5 days	\$59,326
Asthma	16.8%	658	3.2 days	\$35,554
Diabetes	9.8%	1,486	4.6 days	\$52,936
Stroke	2.0% (2013)	1,774	5.7 days	\$78,424

As can be seen in the Table 10 (above), there are several chronic diseases proportions from 2015 summarized that do not often cause mortality themselves, but may contribute to other diseases or acute events that can cause fatalities. Hypertension, for example, may be the underlying cause of a heart attack or stroke, which can in turn cause death. Of note, while only 9.8 percent of Kern County residents report having diabetes, Kern County is ranked 58 out of 58 in diabetes deaths. (20) On the other hand, only 2.0 percent of Kern County residents report having a stroke. A stroke is usually categorized as an acute event rather than a chronic condition and people are not diagnosed until they actually have one. However, chronic conditions such as hypertension are often precede the incident. Thus managing chronic conditions can reduce the risk of acute events. While damage caused by chronic conditions often cannot be reversed, mitigating the condition such as reducing blood pressure to within the normal range, can significantly reduce the risk of developing other diseases or associated complications.

Obesity

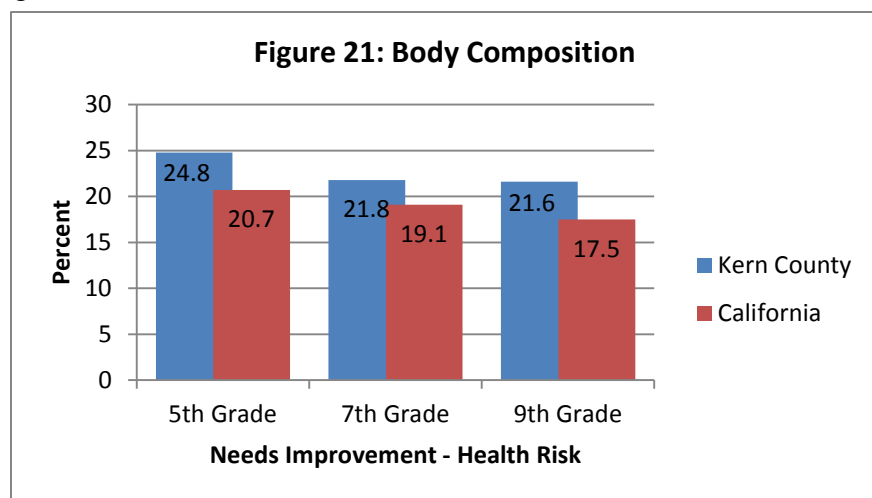
While obesity has a scientific definition of any individual with a body mass index (BMI) over 30 units, in popular culture, it may be used as a general term for anyone who is overweight. Since obesity has been correlated with a number of chronic diseases, reducing obesity is likely to have far



reaching impacts. While California as a whole meets the national objectives for reducing obesity in the population, Kern County continues to have a higher proportion of obese residents than the rest of the State and does not meet the Healthy People 2020 target (Figure 20). Another 37.9 percent of Kern County residents are overweight and at risk for becoming obese. (30) For adults, a BMI between 18.5 and 24.9 is considered healthy. Unfortunately, a smaller proportion of Kern County residents maintain a healthy weight compared to California and Kern County does not meet the Healthy People 2020 target. California, on the other hand, meets the national target for healthy weight. Obesity is on the rise throughout the country; unlike communicable disease where interrupting transmission can show an immediate reduction in the spread of diseases, changes to chronic disease are not so easily measured. Reversing a chronic condition often takes a long-term commitment to making healthy choices and sustaining a healthy lifestyle.

While “childhood obesity” is a common term in popular media, the BMI scale was designed for adults age 20 years and up. Since children are proportionally different from adults as well as continuing to grow in height, calculations for BMI in children are much less stable.

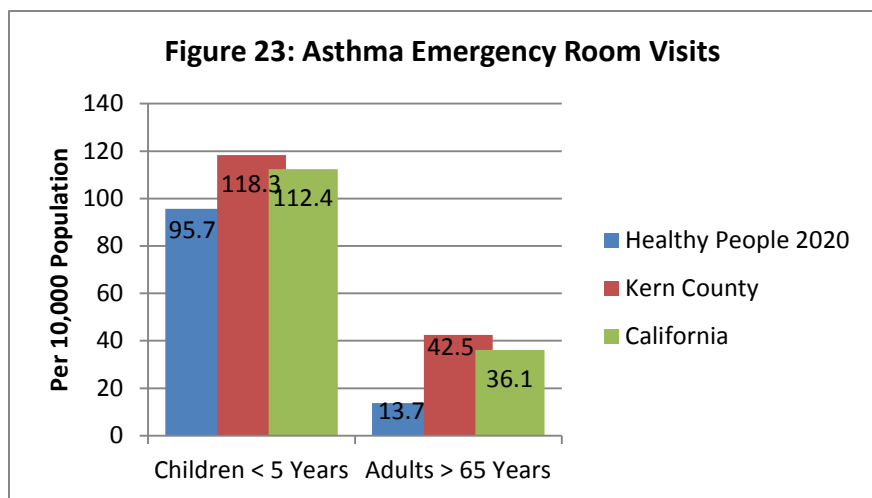
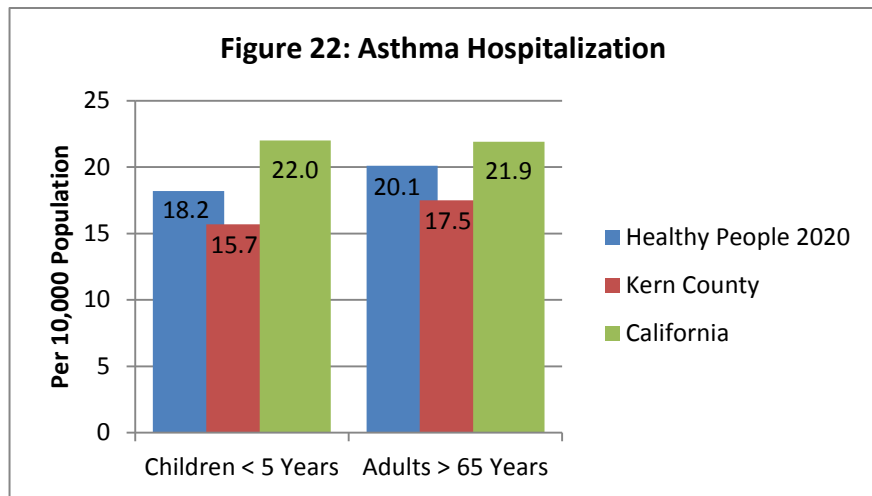
Nevertheless, children with increased weight are at risk for becoming obese as adults as well as all of the associated chronic conditions. During school physical fitness testing, a higher proportion of Kern County fifth and seventh grade students had a body composition that indicated they were at risk for



aversive health conditions compared to the California average (Figure 21, previous page). (32) On the other hand, Kern County had a slightly smaller proportion of ninth graders with high risk body composition compared to the rest of California. While schools can use different tools to measures body composition, decreasing the health risk associated with excess weight is important throughout one’s life. While there are many resources dedicated to developing healthy lifestyles in children, there are fewer resources for adults. Given that children learn their habits from the adults in their life, it is important for adults to both create an environment conducive to healthy living and lead by example.

Asthma

Asthma is a condition of special importance due to Kern County’s historically poor air quality. Poor air quality can aggravate asthma symptoms, and since there is a limit to what any individual can do to avoid air quality, controlling asthma is vital to avoiding emergency situations. While there are very few deaths due to asthma (10 deaths in Kern County in 2013), asthma is a chronic condition that can cause a significant reduction in quality of life. Particularly in young children, asthma causes a number of hospitalizations each year. Kern County met the national target for hospitalizations in children



under age five as well as adults over 65 years of age, but California on average did not (Figure 23). Unfortunately, Kern County saw more emergency room visits in both children under 5 years of age and adults over 65 years of age compared to California; and neither met the national target (Figure 23). A high rate of emergency room visits are certainly a concern, but a smaller hospital admission rate may mean that the symptoms can be controlled and managed in the outpatient setting.

Section 6: Environmental Conditions

A person's physical environment can influence their health in a number of ways. In countries that lack basic sanitation, food and waterborne illnesses continue to run rampant. In areas where access to healthy foods or safe environments for physical activity may be limited, more residents tend to be overweight and obese. Workers exposed to certain chemicals may be more likely to develop certain diseases. Rural areas may have to drive long distances to seek healthcare and may not receive emergency services in time. Even something that seems as innocuous as clutter can cause some people enough stress to raise blood pressure and set off the cascade of related health issues. In the same respect, environments that foster wellness can improve health. Hospitals, once dull, drab, and sterile, have evolved into warm, welcoming, and bright facilities. Structural changes like handrails and warning signs can help avoid accidental slips and falls. There are innumerable factors that affect health, and while it is impossible to control every environmental condition, it is possible to make adjustments to improve our health despite environmental barriers.

Air Quality

Air quality was the second most serious problem in Kern County identified by a 2012 community survey administered by a local hospital collaborative. (33) This is not surprising given that the Bakersfield metropolitan area ranked worst in the nation for short term and annual particle pollution in the State of Air published for 2016. (34) Additionally, the Bakersfield metropolitan area is ranked second to Los Angeles-Long Beach metropolitan area in the nation for ozone pollution. While Kern County still has a ways to go, and despite the

Figure 24: Short-Term Particle & Ozone Pollution Trends

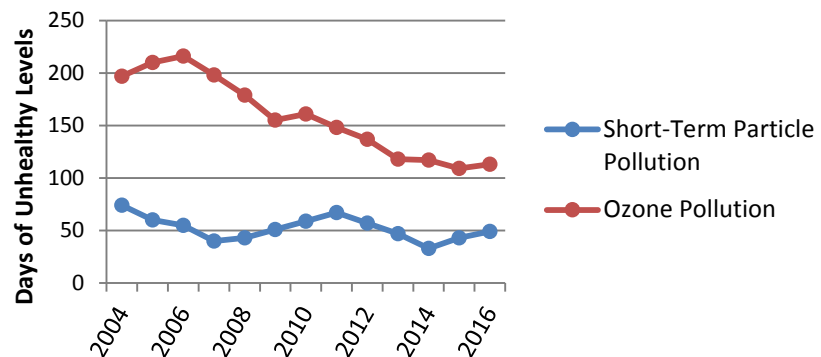
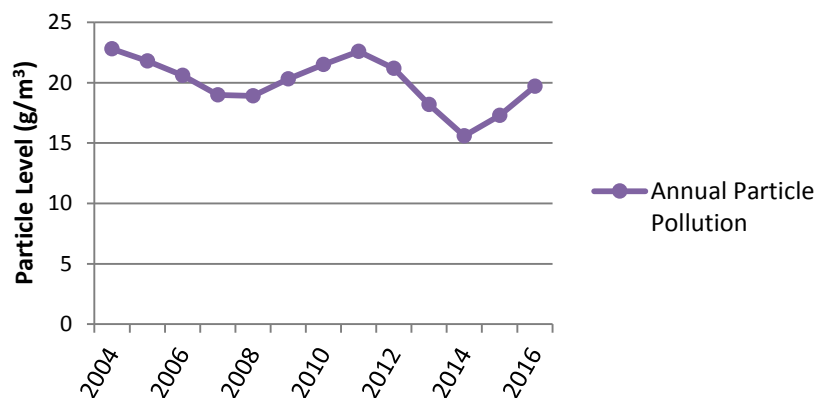


Figure 25: Annual Particle Pollution Trends



notorious rankings, there has been an overall trend of improving air quality and the progress made in the past decade should be applauded (Figure 24 and Figure 25). Systems and policy changes that protect air quality like “no burn” days and promotion of behaviors like carpooling can continue to lower the impact of poor air quality on health.

Climate

Due to the diverse geography of Kern County, from arid high desert to the mountains to the valley, climate also varies. In the metropolitan Bakersfield area, average winter lows are 39 degrees Fahrenheit, and summer highs average 97 degrees Fahrenheit. (35) Average and record highs and lows of select cities show how wide the variability can be (Table 11). Granted, some records are decades old, but there is clearly a wide range of weather throughout the County. Kern County residents often face higher heating and cooling bills than other parts of the State where weather is more temperate. In a

Table 11: Average and Record Temperatures (°F)

	Average		Record	
	High	Low	High	Low
Arvin	101	43	118	22
Bakersfield	97	39	118	12
California City	97	33	111	-5
Delano	100	34	115	14
Maricopa	97	38	116	15
McFarland	100	34	115	14
Ridgecrest	102	31	119	1
Shafter	100	34	115	14
Taft	97	38	116	15
Tehachapi	86	31	103	-4
Wasco	100	34	115	14

community needs assessment survey, participants indicated their greatest need to be having enough money to pay utility bills. (36) This selection was made more often than affordable childcare, food, medical care, transportation, affordable housing, and employment assistance—all things considered in great need. This could be the result of any combination of things. For example, utility bills might be the largest expense in a household and therefore unaffordable, utility bills might be a lower priority than food and medical care and thus less likely to be paid, or residents are unaware of potential assistance for utility bills. In any case, the survey indicates there is a clear need for assistive services. While most utility companies in the greater Bakersfield area offer assistance programs for qualifying households, other areas of Kern County may be served by businesses that do not offer such programs.

Climate can also have a direct impact on health. In the summer, heat exhaustion, heat stroke, and heat-related death are very real concerns in Kern County; dehydration can exacerbate underlying conditions. In the winter, attempting to heat the home with alternate sources like a stove can cause carbon monoxide poisoning and placing heaters too close to furniture or fabrics can ignite fires. A number of respiratory diseases such as influenza are also very common in the winter; extreme temperatures can both keep people in close contact with one another and provide environments in which pathogens thrive. Kern County is also subject to extremely dense fog, which can increase the chances of motor vehicle accidents. High winds and dust storms in

certain parts of the county can aggravate respiratory disorders and contribute to infectious diseases like coccidioidomycosis. Drought conditions throughout the state of California can have an even greater effect on Kern County residents. Drought adversely affects the agricultural industry; lost crops and lower revenue may result in work layoffs, many of whom already earn lower wages, putting more residents at risk of poverty.

Water Quality

While most community water in Kern County is considered safe for consumption, there are a few areas where trace elements exceed the allowable limit. The U.S. Environmental Protection Agency monitors water quality and issues citations for violations. In 2015, arsenic was the most commonly cited violation in Kern County. (37) Certain industries,

Rule Violation	Number of Violations
Arsenic	3389
Coliform (TCR)	2245
Nitrate	676
Radionuclides	114
Synthetic Organic Chemicals	50
Inorganic Chemicals	44

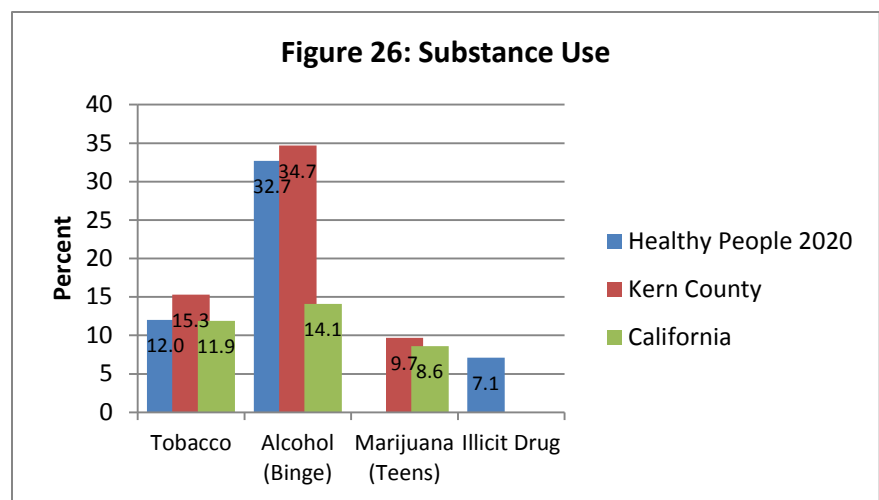
such as mining, create arsenic as a byproduct while others, including agriculture, use arsenic in combination with other chemicals, leaving traces behind. Run off and other contamination leads to increased arsenic in ground water which is then drawn into drinking water systems. Removal of arsenic requires water treatment methods such as ultra-filtration or reverse osmosis. Unfortunately, some small water treatment facilities do not have the resources to implement these measures in a timely manner. Filtration systems can also be installed in individual homes, but may be expensive to maintain. The second most common violation in 2015 was the total coliform rule. While many types of coliforms do not present a health hazard, it serves as an indicator that harmful bacteria may be present. Due to the large amount of people that are served by water facilities, bringing water facilities into compliance with federal regulations and safety standards must be a high priority.

Section 7: Health Behaviors

Health behaviors are decisions we make in response to or as a matter of health and the actions that follow those decisions. The choices made and habits formed can affect both long and short term health. Eating well, washing hands, and visiting a medical provider when ill are all behaviors that are promoted. Unfortunately, despite the volumes of information available to the average person about health and wellness, knowledge does not necessarily translate to healthier behaviors. As cigarette smoking has decreased over the past few decades, obesity has increased. While education certainly has value, it should be done in coordination with policy and structural changes. Tobacco, for example, has been subject to age restrictions and photo identification requirements for purchasing, product specific taxes that increase its cost, advertising restrictions, extensive anti-smoking media campaigns, segregated areas and then completely banned use in public places and workplaces, and prominent warning labels. Additionally, nicotine replacement products are now covered by most health insurances, and increasing social pressure has turned smoking from a glamorous past time to a bad habit. Along with education, these institutional changes have helped curb tobacco use dramatically over the last half a century. Health behaviors can be influenced in many ways and measures to promote healthy behaviors should continue to be implemented.

Tobacco, Alcohol, and Substance Use

In 2015, Kern County had a higher proportion of residents who reported being a current smoker than California as a whole. (30) Kern County also failed to meet the Healthy People 2020 target for proportion of the population of who are smokers, while California as a whole met the target



(Figure 26). When examining local policies and ordinance regarding tobacco control, the American Lung Association in California rated Kern County with a failing grade, indicating few to no policies that protect citizens from the aversive effects of tobacco. (38) On the bright side, Kern County received acknowledgement for a letter “A” grade for efforts to reduce the sales of tobacco products for many cities, indicating that steps in tobacco control are underway. In 2015, over a third of Kern County residents reported binge drinking in the past month compared to much fewer California residents on average. The state met the Healthy People 2020 target, but

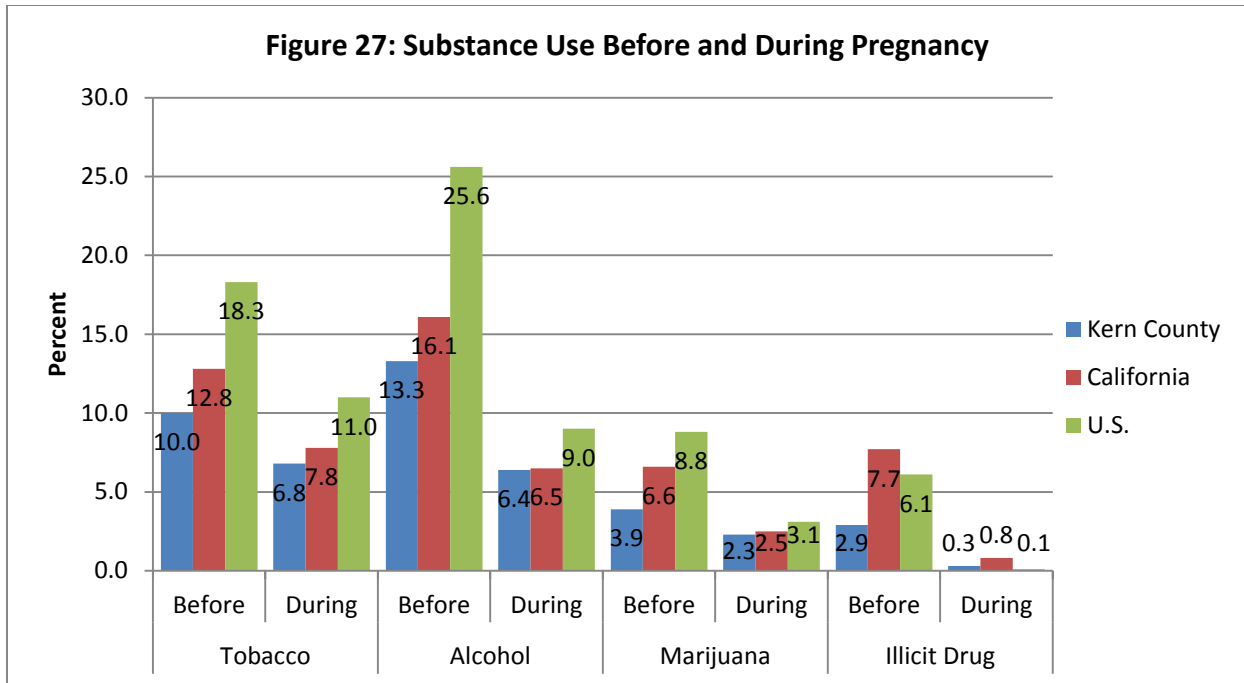
Kern County did not, indicating that binge drinking is a more common occurrence here than other parts of the state. Since marijuana is legal in some states but still classified as an illicit substance in others, there are no specific targets for reducing marijuana use; however, Kern County teens reported greater marijuana use than teens statewide. It is important to note data regarding marijuana use is from 2012, while data regarding tobacco and alcohol is from 2015. While there is a Healthy People 2020 target for reducing past-month illicit substance use, there is no current local or statewide data available for comparison.

In a community survey asking about the seriousness of specific health issues, illegal drug use was third on the list, only behind air quality and obesity. On average, survey respondents indicated illegal drug use in Kern County to be a 4.28 on a five-point Likert scale. (33) In comparison, alcohol abuse was rated 3.86 out of 5 as a community problem. Drug, alcohol, and tobacco abuse treatment programs were also indicated as one of the top ten needs in the community. Methamphetamine is a drug of particular concern in Kern County. Kern County has a methamphetamine reduction task force to help combat methamphetamine use. Law enforcement and first responders are all trained to identify locations where methamphetamine may be produced, as it can pose an explosion hazard. For most clients, referrals to substance abuse programs come through child protective services or the criminal justice system, which may help with compliance, but ultimately may indicate an array of other accompanying issues.

Table 13: Methamphetamine Use

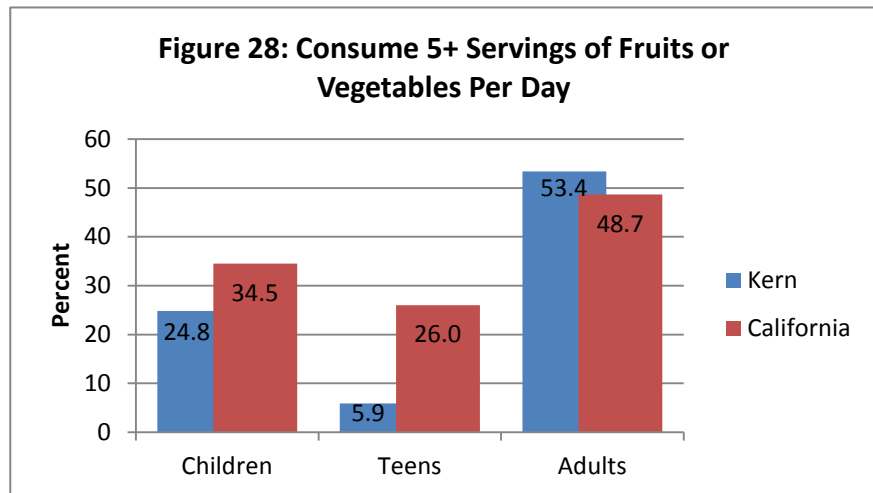
	Percent
Meth Use Reported in Hospital	31.50%
Additional Meth Use Suspected by Physician	4.10%
Mental Health Clients Indicating Meth as Drug of Choice	50.0%
Law Enforcement Encounters Involving Meth	20.0% - 33.1%
Human Services Encounters Involving Meth	27.0%

A population of great concern regarding substance use is pregnant women, since many, if not all, illicit or misused substances can be harmful to a developing fetus. Screening pregnant women for substance use has become standard practice in obstetrics offices; however, only women who seek prenatal care can be screened. Optimally, interventions to reduce substance use would occur prior to pregnancy. Compared to California as a whole and the national rates, a smaller proportion of pregnant women in Kern County report using tobacco, alcohol, marijuana, and/or illicit drugs before or during pregnancy (Figure 27, next page). (39) While this is encouraging news, more than half of Kern County women who use substances prior to knowledge of pregnancy continued to do so while pregnant. The one exception is women using illicit drugs; only about 10 percent continued using while pregnant. These surveys demonstrate the importance of education and intervention during pregnancy to reduce poor birth outcomes associated with substance use.



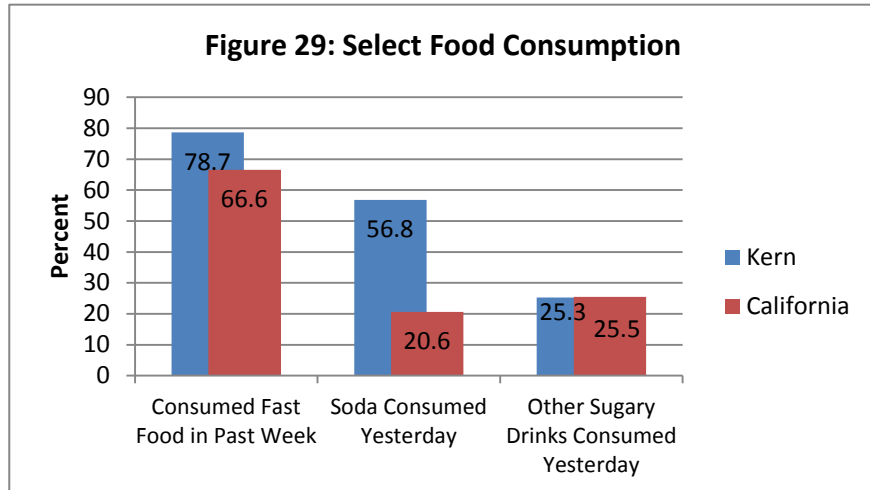
Nutrition, Food Insecurity, and Food Access

The 2012 community survey administered by a local hospital collaborative identified obesity as the most serious problem facing Kern County. While this may be an artifact of increased public awareness about obesity, it nonetheless underscores the need, and potentially the willingness, for change. Both physical activity and



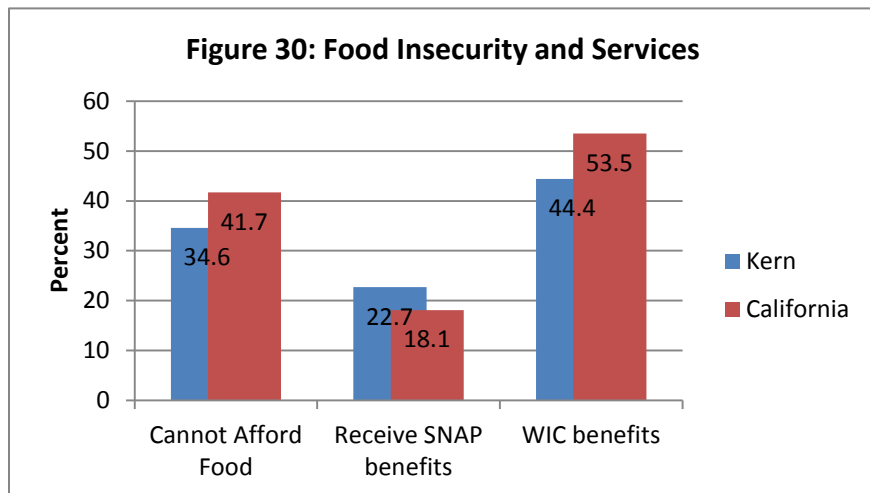
healthy dietary choices play a role in weight management and obesity prevention. While nearly half of all Kern County adults report eating five or more servings of fruits and vegetables per day, teens are less likely to do so both locally and statewide. Compared to California, more Kern County adults consume five or more servings of fruits and vegetables per day, however Kern County children and teens fall short of the average Californian (Figure 28). For adults this may reflect the ease of access to fresh produce as Kern County is a major producer of these goods. Since children are dependent on adults for their dietary options, it remains important for parents to make good decisions for themselves as well as their children.

Increasing healthy choices also means decreasing unhealthy food options. More Kern County residents report consuming fast food in the past week than California as a whole (Figure 29). (30) Granted, there are healthy options available at fast food restaurants and great strides have been taken to



make the nutrition labels publicly available; unfortunately, most consumers do not choose those healthier items when visiting fast food locations. More children and teens in Kern County consumed soda the day prior than the average California child or teen. On the other hand, a similar proportion of children and teens in Kern County and California consumed another sort of sugary beverage the day prior. This may be the result of systemic changes prohibiting certain types of beverages to be sold on school campuses, and increased public awareness of the benefits of healthy beverages.

Fewer Kern County residents report not being able to afford enough food compared to the State (Figure 30). (30) In 2014, a larger proportion of Kern County households were receiving Supplemental Nutrition Assistance Program (SNAP) benefits than state average. In 2013, fewer Kern County households reported



receiving Women, Infants, and Children (WIC) benefits than California as a whole. This may be the result of many factors including a high poverty rate, larger family sizes, and an overall younger population. During the 2015-2016 school year, more than 71 percent of Kern County students were eligible for Free and Reduce Priced Meals, indicating their family income was such that they were at risk for not being able to afford enough food. (40) While the National School Lunch Program certainly reduces food insecurity and increases balanced nutrition, it is a supplement and not the end solution to the problem. Additionally, in a survey of seven selected Kern County neighborhoods at high risk of food insecurity, all of the stores in those

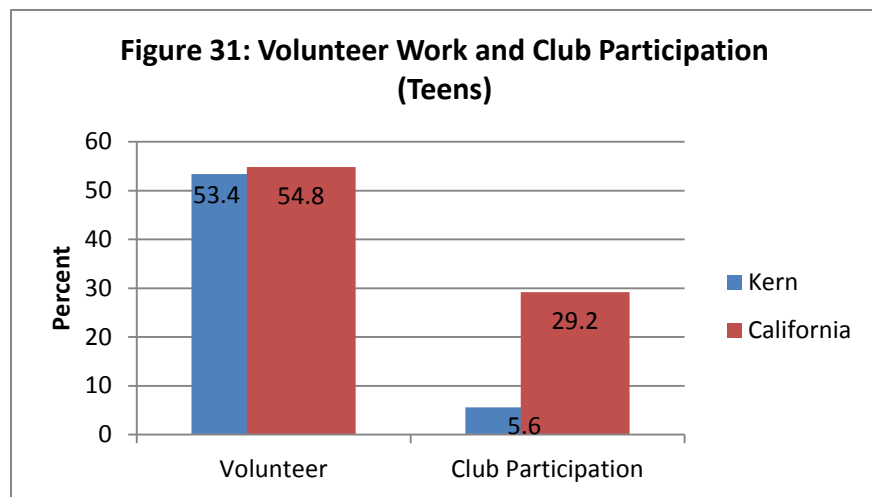
neighborhoods sold fruits and vegetables at a price more than 10 percent than the county average. (41) Thus, places at highest risk had lower healthy food affordability, making it even less likely that healthy foods will be purchased. In that same survey, 50 percent or less of the neighborhood population was within half a mile of a supermarket, limiting access to healthy foods. While these residents may live near a smaller market or a convenience store that carries food, fresh fruits and vegetables may be limited at these types of retailers.

Section 8: Social Behaviors

Social behaviors can have a direct as well as an indirect effect on health. Engaging in risky behaviors such as drug use or unprotected sex can result in infections and diseases. More often, social behaviors have more subtle outcomes. A 2003 study found that increased sociability was associated with decreased probability of developing a cold. (42) Additionally, there are numerous studies which cite social support as a protective factor in mental and emotional disorders such as depression and anxiety. (43) (44) Those with social support often have a network from which to draw resources when in need. They tend to be healthier, both physically and mentally.

Community Involvement

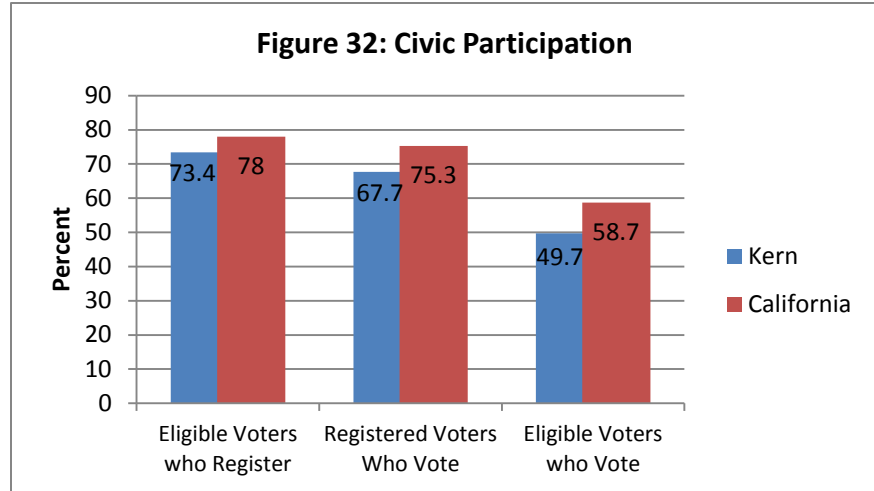
Over half of all Kern County teens report performing volunteer work or community service, which is similar to California as a whole (Figure 31). (30) Many local high schools encourage or require community services as part of their graduation requirements. Far fewer



Kern County teens participate in a club compared to the average teen in California. There are a variety of programs available in Kern County. The Boys and Girls Club provides on-campus after school programs for a number of the elementary schools. Both the Bakersfield Police Activities League and the Kern County Sheriff's Activity League provide academic and athletic programs for local youth. While some programs have associated costs, such as personal athletic clothes, others are completely free of charge. These opportunities provide a safe environment for children and youth after school as well as other support services like assistance with homework. There are also ample opportunities for private companies that offer enrichment programs throughout Kern County. Unfortunately, Kern County's YMCA closed in 2012 after 85 years of operation, which may have resulted in fewer after-school opportunities.

Civic Participation

Civic participation, in the form of voting, demonstrates involvement in the community through legislative decision making. Those who are invested in their communities, are more likely to contribute to their community and have better mental and emotional health. A smaller



proportion of Kern County residents registered to vote in the last general election compared to California. Additionally, of those who were registered, a smaller proportion cast a ballot compared to California, thus the proportion of eligible voters who vote was much less in Kern County compared to California (Figure 32). Historically, a number of great strides in public health have come from ballot initiatives. Proposition 65 (commonly known as the Safe Drinking Water and Toxic Enforcement Act of 1986) regulates substances officially listed by California to cause cancer, birth defects, or reproductive harm by prohibiting business from disposing such substances in manners which may contaminate drinking water and requiring business to disclose all potential exposures to such chemicals to consumers and employees. At the local level, Kern County's Sludge Initiative, Measure E (2006), sought to ban imported sewage, but is still being litigated.

Section 9: Health and Safety

Without meeting the immediate need of personal safety, preventative health care, chronic health conditions, and environmental improvement all become inconsequential. Creating a secure environment in which individuals can pursue healthy lifestyles is equally important as educating individuals about such decisions. Safety is the condition of being protected from danger, risk, or harm. It is often recognized as the control of hazards to an acceptable level of risk. There are various measures of safety. A safe park, for example, could mean that the equipment is in good working condition, posing no immediate physical danger. On the other hand, a safe park could also mean it is free of drug and gang activity, a more subtle threat to safety. The safety of the park, in turn, determines who will use it and how often; in that, it can either hinder or increase the likelihood residents will engage in physical activity. Thus, while the goal may be to be physically active, if the built environment is not favorable, chances of activity are small.

Crime

Crime can have a direct effect on physical health by inflicting injury or causing death. Theft of medical devices and medications can also require urgent remediation to avoid physical harm. More often, however, crime has a psychological consequence that is detrimental to health. By creating situations of high stress, crime can aggravate conditions that are otherwise under control. Anxiety and adrenaline can trigger an asthma attack. Long-term stress can lower immunity and provide avenues for infection or worsening of chronic diseases. Studies suggest that perpetrators of crime are more likely to suffer from poor health compared to non-offenders and those who stop offending. (45)

Violent crime, which includes murder, non-negligent manslaughter, forcible rape, robbery, and aggravated assault, has fluctuated over the years in Kern County. (46) Crime data is cataloged by individual law enforcement agencies, each of which has a particular jurisdiction. In contrast, the Kern County Sheriff's Department (KCSO) serves all unincorporated areas of the County and provides services for some of the smaller cities that do not have their own police department. In 2014, KCSO reported a total of 2,378 violent crimes. Rates are reported per 100,000 residents to compare across jurisdictions but no rate is calculated for KCSO due to the general and over encompassing nature of their jurisdiction. The city of Arvin continues to have the highest rate of violent crime in the County. Property crime which includes burglary, larceny/theft, and motor vehicle theft, has also fluctuated over the years. Bakersfield continues to have the highest rate of property crime and the Sheriff's Department reported 18,207 incidents of property crime.

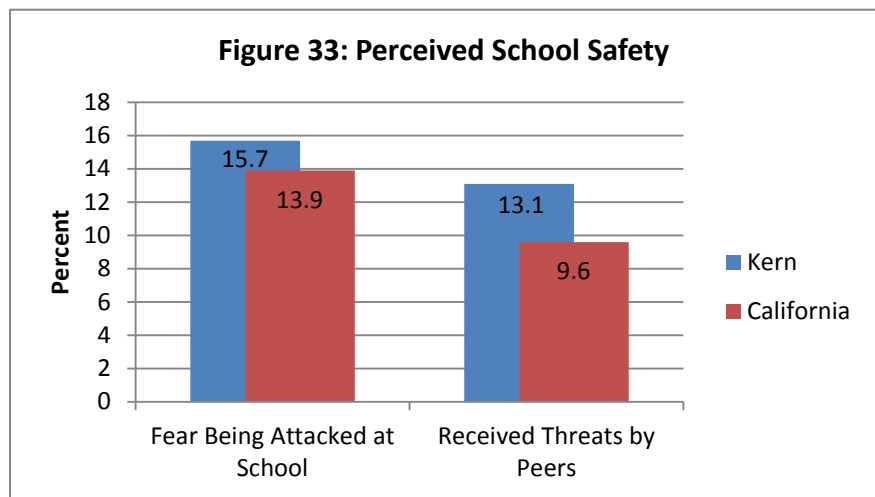
Police Department	Violent Crime Rate	Property Crime Rate
Arvin	861.7	2351.4
Bakersfield	456.7	3972.4
California City	599.9	3652.8
Delano	411.7	2845.4
McFarland	526.5	1863.0
Ridgecrest	409.3	1630.2
Shafter	266.9	2680.6

Safety

Safety is the condition of being protected from harm, physically and otherwise. Many of the effects associated with crime can also occur when safety is lacking. Unlike crime, which is explicitly associated with the legal system, safety can be jeopardized in much more subtle ways. A lack of sidewalks may inhibit physical activity as pedestrians fear being struck by a motor vehicle, or a person could trip and be injured. In a completely different respect, a lack of overall perceived safety in the neighborhood may inhibit physical activity by discouraging people from playing outside. Increased safety can boost psychological/mental health as well as provide opportunities to improve physical health.

In a survey performed in Delano, gang violence prevention services was most often indicated to have a very high need in the community, ranking higher than medical care, health insurance, and access to healthcare. (33) During the 2014-2015 fiscal year, 869 children were admitted into the Jamison Children's Center, the County's protective custody facility, indicating the children had been removed by law enforcement or social services due to abuse, neglect, or exploitation. This is likely only a small fraction of children throughout the County whose basic needs are not being met.

Violence in schools has also received increasing attention. A larger proportion of Kern County teens reported fear of being attacked at school, compared to California; additionally, more Kern County students report receiving threats from peers compared to California (Figure 33). In



In 2013, a school shooting at a Kern County high school made national headlines, even more newsworthy because the perpetrator was talked into surrendering before injuring additional students. This likely affects students perceived school safety, as very few counties have been affected by an actual school shooting. Nevertheless, during the 2014-2015 school year a total of 198 students were expelled, 27 students in Kern County were expelled for weapons possession, 46 students were expelled for a violent incident which included physical injury; another 65 students were expelled for a violent incident in which no injury occurred, such as harassment, intimidation, bullying, threats, and attempts at physical injury. (47) With more than one hundred eighty thousand students enrolled countywide, this represents about 0.2 of a percent. Clearly, Kern County is not immune from violence in schools, but violence is a rare occurrence.

Electronic aggression, commonly referred to as cyber bullying, is also a fairly new realm of study and uniform definitions have not been adopted. Nationwide, 9 percent to 35 percent of young people report being a victim of electronic aggression while 4 percent to 21 percent of teens reporting being a perpetrator of such acts. (48) The large range is an artifact of inconsistent sampling and questioning across research. The CDC estimates a range of 8 percent to 11 percent of young people to have been victims of electronic aggression and 4 percent to have committed electronic aggression. While news media has focused on cyber bullying in recent years, it is still less commonly reported than face-to-face bullying.

Occupational Safety

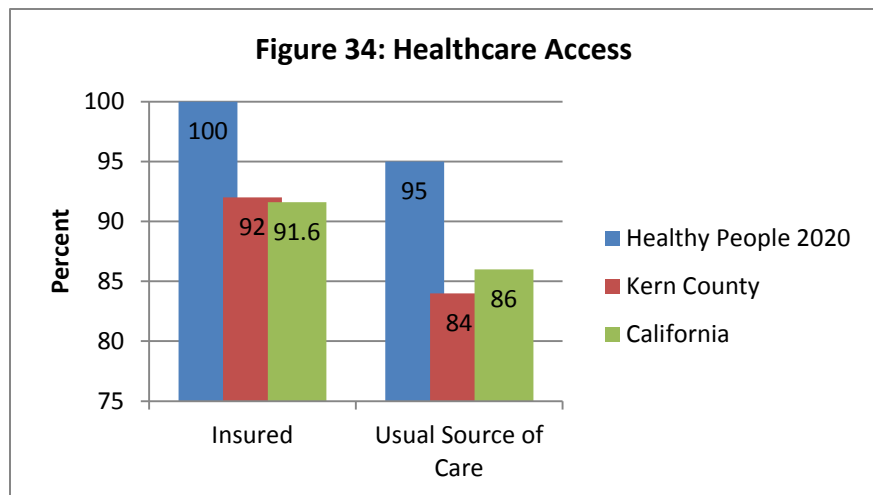
In 2014, there were 344 fatal injuries in the state of California reported to the Department of Industrial Relations Division of Occupational Safety and Health, commonly known as Cal/OSHA. (49) Due to small number of workplace fatalities, information is not reported by individual counties. However, looking at some of the most common industries in Kern County may provide insight into the risk of fatal occupational injury. Nearly 15 percent of fatal injuries occurred in the construction industry, 8.1 percent in mining (which includes oil and gas extraction), and 3.5 percent in crop production. Hundreds of thousands of workplace injuries occur every year as well; however, county-level details are not available. In 2015, 8,300 non-fatal injuries occurred in the crop production industries; 200 injuries in mining (including oil and gas extraction), and 21,200 in construction. (50) Since the majority of individuals spend more than half of their waking hours at work, workplace safety plays an important role in overall health.

Section 10: Access to Healthcare

Access to healthcare is vital to a person's health. At some point in time, every individual needs some interaction with a healthcare provider. The lack of access results in poorer health outcomes; the smallest scratch can develop into an infected wound which could require extensive surgical procedures if not treated. Preventative services, detection and treatment of illness, as well as supportive care all help prolong life, as well as improve quality of life. A number of components influence access to healthcare. One of the most commonly cited is health insurance coverage which helps cover the cost of services. Those who are unable to pay are more likely to forgo care. Services provided can also vary both in quality and availability. In Kern County, unfortunately, many patients have to travel outside the county to seek specialized care or providers may only provide local services a few days a week. Improving access is vital to safeguarding the health of the public.

Lack of Health Insurance

While Healthy People 2020 aims for 100 percent health insurance coverage nationwide, both Kern County and California continue to fall short (Figure 34). In a community survey administered by a local community service organization, the cost of healthcare and medicine



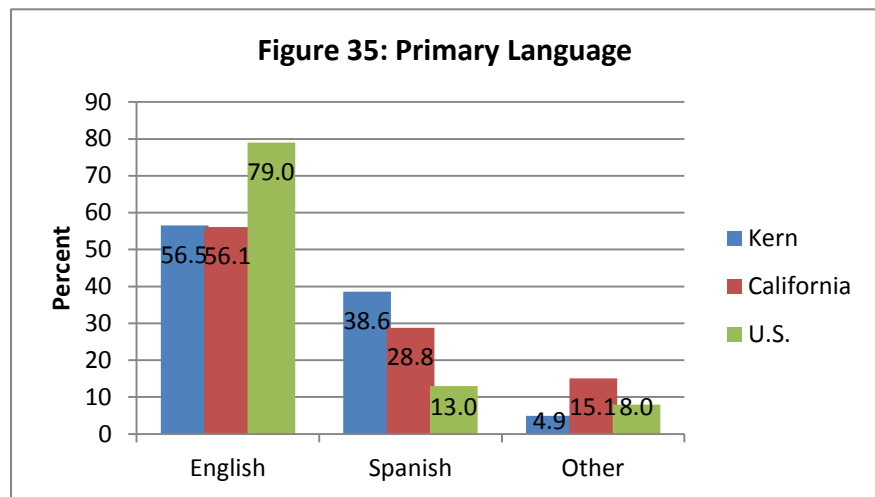
was the greatest health concern for English-language respondents. (36) Alternately, Spanish-language respondents indicated lack of health insurance was the greatest health concern. While these were two distinct categories, they are intertwined in that health insurance is meant to offset the cost of health services. With the implementation of the Patient Protection and Affordable Care Act in 2014, it was expected that the proportion of residents without insurance would decline. However, it was highly likely that there would remain a small population lacking health insurance coverage, such as undocumented immigrants, who will continue to face barriers to healthcare.

Additionally, Kern County falls short of the Healthy People 2020 target for increasing the proportion of residents with a usual source of care, and is slightly less than California as a whole. Continuity of care has shown to have better health outcomes; patients who have a regular provider are more likely to trust the provider and more likely to follow guidance provided by the provider. In turn, providers who are familiar with their patients are better equipped to prevent,

detect, and treat illnesses. Those lacking health insurance often seek care at urgent care centers and emergency rooms. Those facilities exist mainly to preserve life and resolve serious symptoms; they are not designed to provide long-term services or support to the patient. As more patients become insured, it is hoped that they will also find a medical home with a provider who can help them maintain and improve their overall health preemptively.

Language Barriers

While the proportion of Kern County residents whose primary language was English was similar to the proportion statewide, both were far smaller than the nation as a whole (Figure 35). (6) In Kern County, Spanish was the most commonly spoken language other than English. Language is a



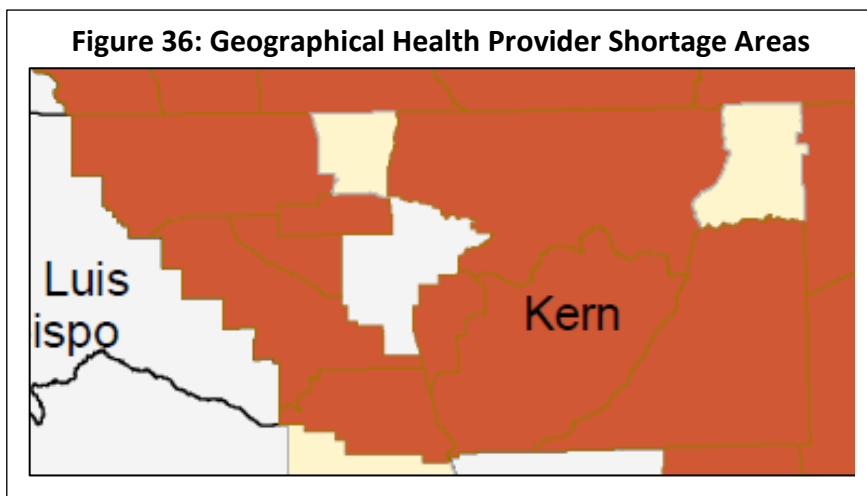
barrier in many things, but particularly in healthcare. Many non-English speakers use their children as everyday interpreters, and children may not understand the gravity or magnitude of a conversation regarding health. Due to the technical nature of medical terminology, even a person who speaks the language fluently may not be properly equipped to interpret. It is also possible that both the provider and the patient normally speak a language other than English (and not the same as each other), further compounding miscommunications. In 2015, 6.0 percent of Kern County residents reported having a hard time understanding their healthcare provider compared to 3.8 percent statewide. (30) There are several well-documented incidents where language misinterpretation resulted in delayed or inappropriate care. In 2012, an exposé about Kern County physicians revealed that 57 percent had attended medical schools overseas. (51) While all physicians must complete a residency in the U.S., language remains a challenge.

Lack of Transportation

In a survey administered by the Kern Council of Governments to public services agencies regarding public transportation, 37 percent of agency representatives who were surveyed identified local, medically-related trips as the most needed transportation service by their clients followed by 24 percent reporting regional medically-related transportation. (52) A survey directly administered to Kern Regional Transit riders found that 17 percent of riders indicated their bus trip was for medical purposes. (53) Golden Empire Transit (GET) serves the greater Bakersfield area through regular bus routes that operate 7 days a week with over 1,000 bus stops. Kern Regional Transit serves other areas of Kern County; while a few of the larger areas are

served seven days a week, others receive service just once per week. Many of the routes serve to connect the major city centers to Bakersfield, rather than providing service within the community, although Kern Regional Transit has agreements with the cities of Delano, Taft, and Ridgecrest to provide city services. Some areas are served by regular bus routes, while others use a first come, first served dial-a-ride service. Access to healthcare starts with eliminating physical barriers; regardless of insurance or finances, a person who cannot physically attend a medical appointment cannot receive services. While there have been some forays into telemedicine, including the Kern County Public Health Services Department, it is not an alternative to transportation to services.

The areas shaded in orange on the map of Kern County have been identified as health provider shortage areas indicating primary care providers are over utilized, excessively distant, or inaccessible (Figure 36). (54) This indicates that residents of these areas must seek services outside their community for even the



most basic services. The Delano and Ridgecrest area are designed as low income/migrant farmworker health provider shortage areas, indicating that while there is not a general shortage of providers for the total population of that area, for specific population groups, a shortage remains. The greater Bakersfield area is not a designated health professional shortage area, indicating that there are enough providers in the major metropolitan area to serve the population. Granted, a large proportion of Kern County's population resides in the Bakersfield area; however, those that live in more distant areas may be at a disadvantage when seeking care.

Homelessness

Poor health can be a major contributor to homelessness; illness can cause a loss of productivity which can cause loss of employment which can cause loss of income which can cause loss of home. In a recent publication of a price-comparison website, more personal bankruptcies were due to unpaid medical bills than credit card debt or unpaid mortgages. (55) In the same respect, homelessness can contribute to poor health. Chronic conditions can be exacerbated by the stress of finding shelter, being exposed to elements, malnutrition, and lack of medical care. Medications may be lost or stolen or compromised by heat and moisture. Lack of basic hygiene

can impede healing of minor cuts or scrapes. Mental health or substance abuse issues can be compounded by difficult and depressing situations. These issues can also be notoriously difficult to treat in a transient population. Clients often fail to return to the clinic when advised; even shelter-based clinics have difficulty following up with clients who do not return to the shelter regularly. While homeless shelters provide temporary housing, close quarters can also contribute to transmission of infectious diseases.

There are two homeless shelters in metropolitan Bakersfield, but no shelters in other areas of the county. Emergency shelters for domestic violence, sexual assault, and child abuse do exist throughout the county, but the population they serve are not the same as those who are chronically homeless. While half of the county's population resides in Bakersfield and surrounding areas, the other half does not, indicating potentially half of all homeless are unsheltered. In 2015, the Kern County Homeless Collaborative conducted a snapshot survey of the homeless population, documenting responses from 953 homeless individuals during a 24-hour survey period. More than 56% of the homeless surveyed reported alcohol abuse and nearly 53% reported methamphetamine use. (56) Whether homelessness contributes to substance abuse or substance abuse leads to homelessness, both of these factors affect a person's overall health. Over 111 homeless adults reported being infected with hepatitis C, more than those reporting coccidioidomycosis (valley fever), tuberculosis, and HIV/AIDS, combined. Hepatitis C can cause liver damage, cirrhosis, and liver cancer, all of which can be compounded by alcohol use. While there have been recent advances in hepatitis C treatment, homelessness severely limits access to care. Both the Bakersfield Homeless Shelter and the Mission at Kern County (formerly known as the Bakersfield Rescue Mission) offer some basic medical services to their clients. In this particularly vulnerable population, it remains important to find additional ways to safeguard their health.

Conclusion

In summary, the health of Kern County is dependent on many factors, only some of which are named in this report. While great strides have been achieved in some avenues (e.g. reduction of the heart disease deaths, better air quality) there are still some areas in need of improvement (e.g. birth outcomes, sexually transmitted infection rates). As some needs are met, others will arise; identifying and adapting to those needs will remain the goal of Public Health Services. Even though Kern County does meet a number of the Healthy People 2020 national objectives, it often falls short of the average rate for California. In other cases, Kern County may exceed the state average, but still may not reach the national target. Therefore, before declaring a need met, it will be important to measure against several metrics. Even when Kern County succeeds in meeting and surpassing set targets, continued efforts should be put forth to improve health and maintain good health. If at all possible, met needs should not be sacrificed while pursuing other unmet needs. In assessing the needs of Kern County, a few select areas have been noted which merit focused attention. Hopefully in meeting those needs, Kern County will see an improvement in overall health.

Acknowledgements:

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