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Understanding Youth Health in the Capital Region

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Introduction

Youth mental and physical health and safety are essential components of positive youth development and a successful transition to adulthood. Although most young people enjoy good health most of the time, during the years between 12 and 24, young people may be exposed to formative environments or become involved in risk-taking behaviors. Attitudes and behaviors developed during this time, whether positive or negative, will influence ongoing behaviors and have life-long impacts (Ministry of Health, 2008).

The variables affecting youth health comprise broad and often overlapping segments of healthcare, social and environmental systems. While there are many paradigms through which to understand these systems and their effects on health, this paper will follow the model shown in Figure 1. The author developed this model to include major aspects of physical and mental health as well as health system and social determinants of health. In the sections that follow, the reader will observe common themes that tie in closely with the other strands of the Healthy Youth/ Healthy Regions research and references to those works will be made where appropriate.

Figure 1: This figure represents one method for examining the state of youth health.

Within these overlapping systems, factors such as socio-economic status, education attainment, race/ethnicity and geography need to be analyzed and understood in order to identify and ultimately eradicate disparities.

How do we know when disparities exist? Is it enough to simply compare one population's health status to another's? While this is a common approach to understanding, the corollary to that thought is, "To whom do we compare our results?" Within the Capital Region, this paper makes several comparisons - from one zip code to another, by county, to the state or the nation. Yet there are times when the aggregated health of any area does not meet desired standards. For that reason, when possible, comparisons will be made to the Healthy People 2010 indicators, a set of national health objectives designed to identify the most significant preventable threats to health and establish national goals to reduce these threats (U.S.Dept. of Health and Human Services). Through these comparisons, the health of youth in the Capital Region will be examined.

Global Health Measures

One of the most common global measures of health is average life expectancy. An individual's life expectancy from birth is considered one of the most sensitive measures of a population's well-being. As an example, the increases in longevity enjoyed by Americans over the last century can be attributed to improved living conditions, better nutrition, sanitation, healthier lifestyles and advances in medicine. Longer life expectancies in certain places might be considered a surrogate measure for how healthy that place is to live for adults and youth alike. In Figure 2, the 2006 average life expectancy for each Capital Region county is shown. Since the nine counties within the region may differ in substantive ways (by population composition, density and rural/urban designations), each county is also compared to a group of peer counties selected from across the country. Further comparisons may be made to the Capital Region average, the state and the nation. There is a clear disparity seen in Yuba County whose overall life expectancy is 73.8 years compared to the regional mean of 77.7 years.

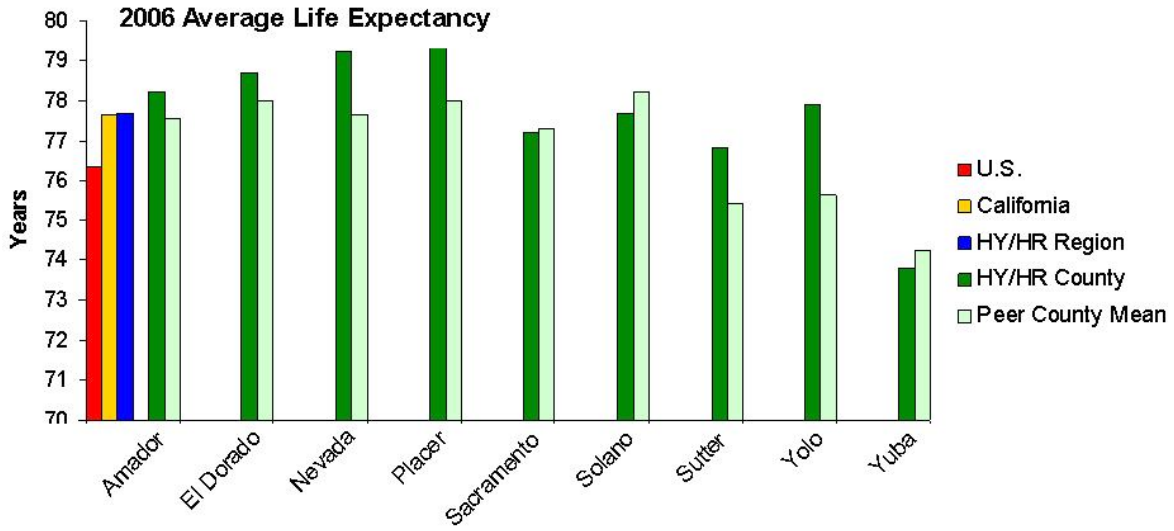
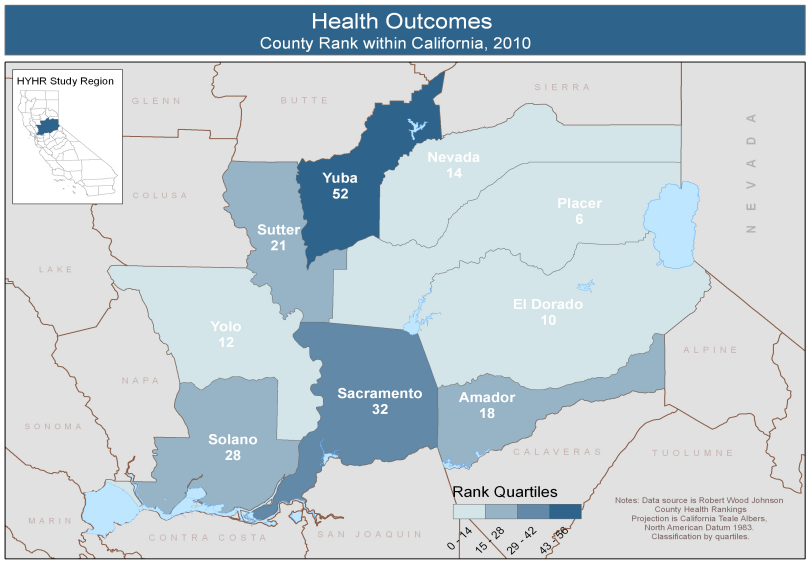


Figure 2: This measure represents the average number of years that a baby born in a particular year may be expected to live if current age-specific mortality trends continue to apply. Methodology and source information described in Murray CJL, Kulkarni SC, Michaud C, *et al.* 2006. Data came from the Community Health Status Indicators (U.S. Dept of Health and Human Services CHSI 2010)

Looking at a population's health outcomes through the lens of major morbidities and mortality provides some more detailed information about health status. Mortality, or death, is a universal and clearly defined event. The factors that contribute to some populations experiencing higher mortality should be examined for prevalent and preventable causes as well as assets or protective factors that can be supported to improve life expectancy (see the section on Excess Death in this paper). On the other hand, as the population ages, mortality measures alone are inadequate and measures of morbidity can provide additional insights into overall health.

The Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute developed a nationwide system (County Health Rankings) for assessing population health at the county level and provide data that compares and ranks counties within each state (Robert Wood Johnson Foundation, 2010). Figure 3 shows how the Capital Region fares with regard to morbidity,

mortality and overall health outcomes compared to the 58 counties in the state. In the maps, the counties with high ranks (e.g., 1 or 2) are the 'healthiest.' The color shading aggregates the ranks throughout the state into quartiles such that the lightest color would represent the top 25% of counties for this measure.



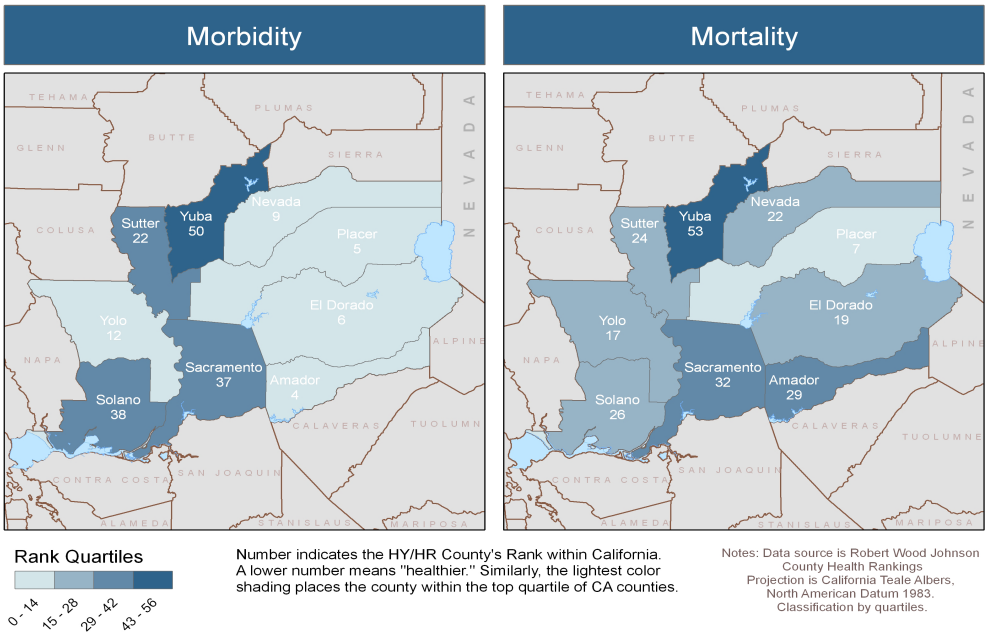


Figure 3: Health Outcomes is a summary measure of morbidity and mortality. The morbidity rank includes four measures: self-reported 'fair' or 'poor' health, poor physical health days, poor mental health days, and percent of births with low birth weight. The mortality rank is based on a measure of premature death - the years of potential life lost prior to age 75. For example, the death of an adolescent youth at age 15 would represent 60 years of potential life lost.

According to these indicators, for example, Sacramento County is in the bottom 50% of California counties for morbidity and mortality and Yuba County is in the bottom 25%, while Yolo is in the top 25%.

A more detailed look at the individual measures of morbidity and mortality is provided in Figures 4-8 below.

Asking individuals to rate their health on scale ranging from 'poor' to 'excellent' has been shown to be a strong indicator of future healthcare use and mortality (McCallum et al., 1994) Using individual value systems and subjective measures of physical and mental health, the results of this question still relates very closely to more objective clinical experiences of illness, disability and mental health status (Hetzel et al., 2004).

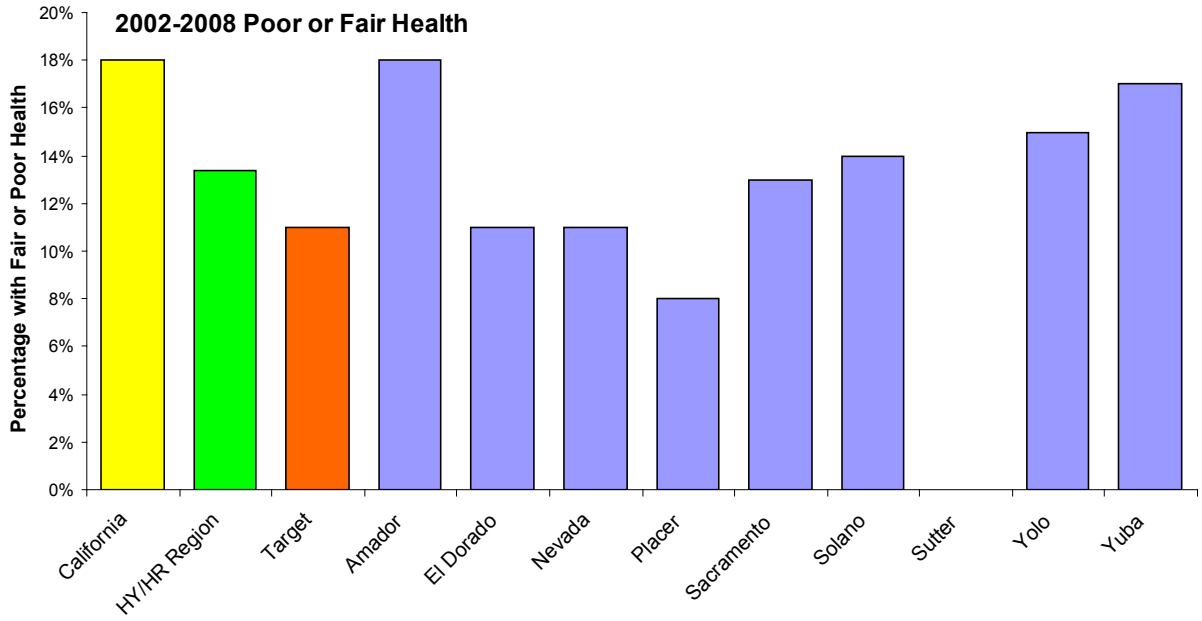


Figure 4: Poor or fair health is represented by the percent of adult respondents surveyed who rate their health as "fair" or "poor." The measure is age-adjusted to the 2000 U.S. population. Data come from the Behavioral Risk Factor Surveillance System via the Robert Wood Johnson County Health Rankings (RWJ CHR)[5]. Sutter County has no data for this indicator. The 'Target' levels developed in this set of indicators is based on a goal of reaching the 90th percentile, i.e. only 10% are better.

On average the Capital Region experiences a smaller percentage of fair or poor health compared to the California population, though Amador and Yuba County have noticeably elevated rates in this indicator.

Poor health may manifest as either physical or mental un-wellness. In Figure 5 most of the Capital Region (except El Dorado and Nevada Counties) experienced more poor physical health days than targeted with Sutter, Yolo and Yuba Counties having the highest rates topping both the state and the regional averages. Figure 6 explains the poor mental health days in the region with only El Dorado and Sutter Counties meeting target rates. All other counties were above goals and Sacramento County had the highest number of poor mental health days in the region.

Low birthweight is included as a global measure of health because it represents the mother's exposure to personal, behavioral and environmental health risks. This indicator also characterizes the infant's current and future morbidity as well as premature mortality risk since the consequences of

low birthweight are numerous and potentially fatal. Figure 7 shows how poorly the Capital Region fares regarding the low birthweight indicator, particularly Yuba County.

Finally, premature death provides insight into high-risk areas in the region and suggests where further research into cause of death may be needed (see also the section on Excess Youth Death in this paper). According to Figure 8, Yuba County to a great extent and Amador and Sacramento Counties to a lesser extent are suffering the highest levels of premature death in the region.

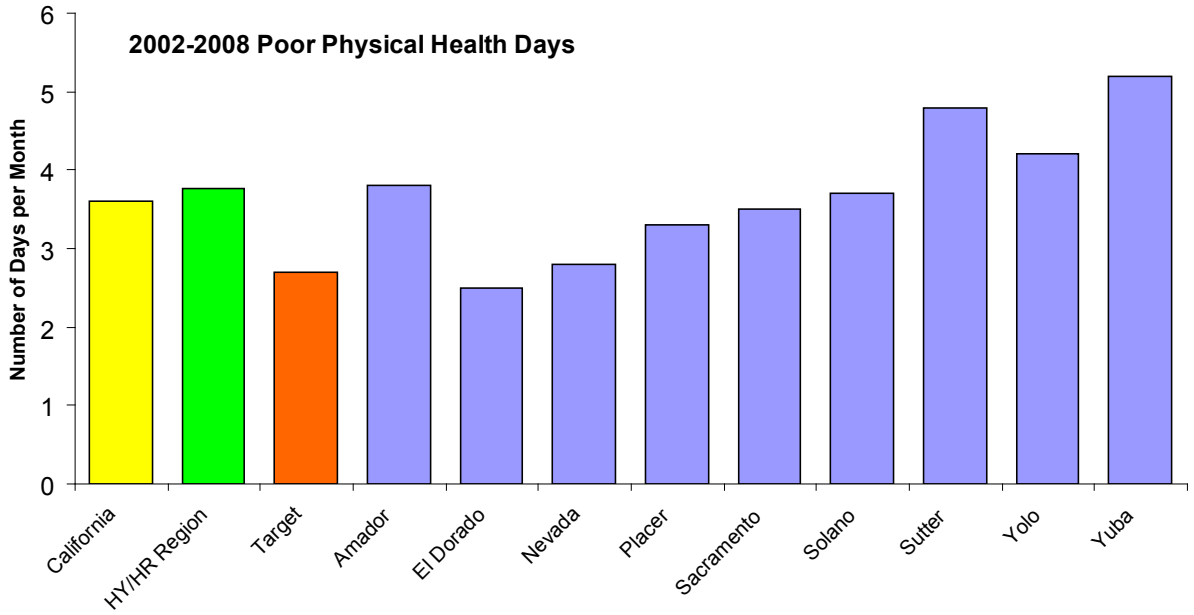


Figure 5: Poor or physical health days represent the average number of days that a county's adult respondents report that their physical health was not good. The measure is age-adjusted to the 2000 U.S. population. Data come from the Behavioral Risk Factor Surveillance System via RWJ CHR (Robert Wood Johnson Foundation 2010).

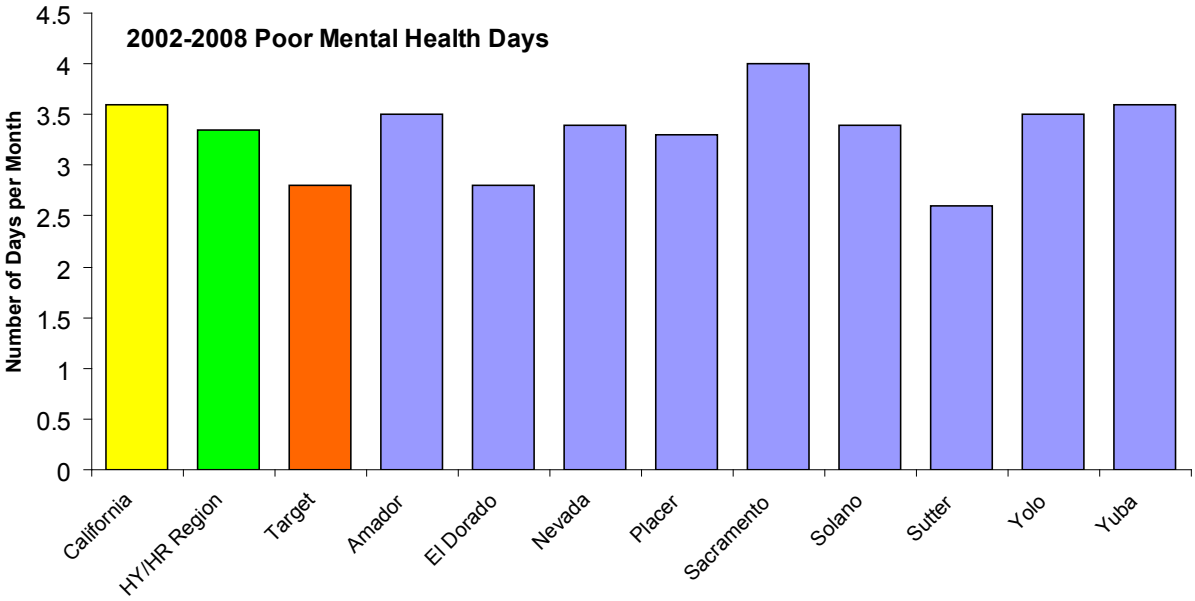


Figure 6: Poor or mental health days represent the average number of days that a county's adult respondents report that their mental health was not good. The measure is age-adjusted to the 2000 U.S. population. Data come from the Behavioral Risk Factor Surveillance System via RWJ CHR (Robert Wood Johnson Foundation 2010).

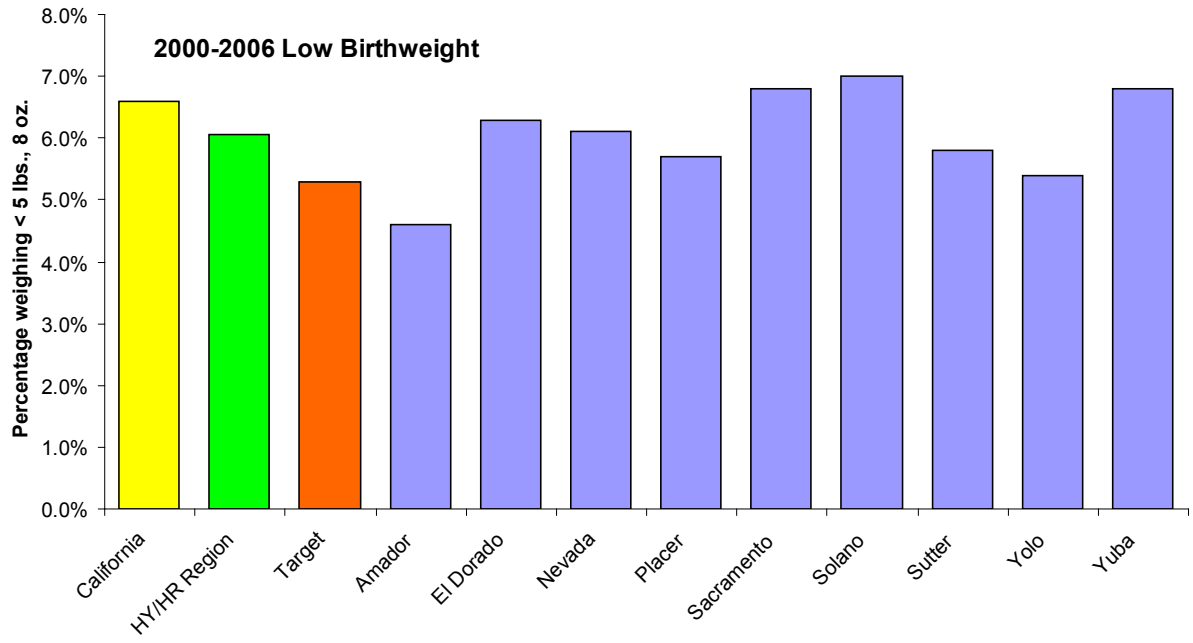


Figure 7: Low birthweight is the percent of live births for which the infant weighed less than 2,500 grams (approximately 5 lbs., 8 oz.). Data come from the National Center for Health Statistics via RWJ CHR (Robert Wood Johnson Foundation 2010).

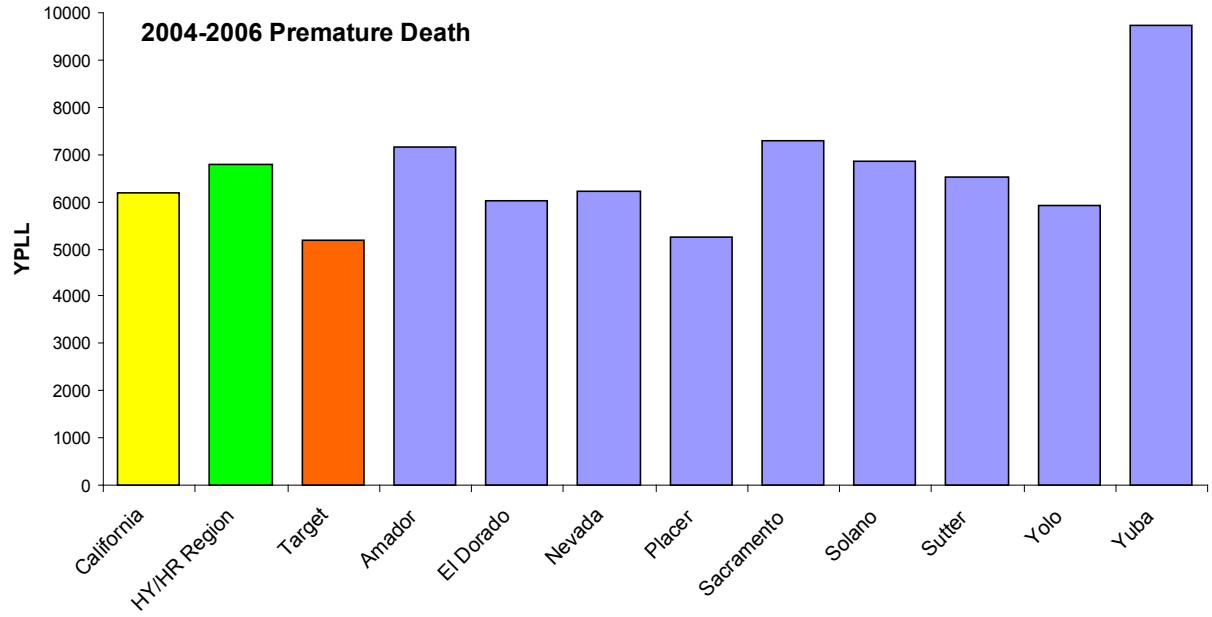


Figure 8: Premature death is represented by the years of potential life lost (YPLL) before age 75. It is presented as a rate per 100,000 population that is age-adjusted to the 2000 U.S. population. Data come from the National Center for Health Statistics via RWJ CHR (Robert Wood Johnson Foundation, 2010).

Summary of global health measures:

Global health measures, while not specific to youth, provide a starting point to understanding the overall health-related environments in which youth live. General observations that can be made from these data include:

- Placer, Nevada and El Dorado counties appear to enjoy the best health, overall, according to these measures.
- Yuba County fares poorly in all global measure of health. Sacramento County scores in the lower ranges more often than not.
- El Dorado County meets target ranges for most indicators while the rest of the region does not consistently meet global health related goals.

Some individuals face significant challenges to obtaining needed health care services. While this poses an obvious threat to individual health, it can also impact the community's health. For example, children who do not receive recommended vaccinations may become ill and spread disease to others, creating both individual and societal burdens of disease. Typical measures of health care access include health insurance coverage and access to service providers. In a policy brief from Mathematica Policy Research, Inc., Jill Bernstein et al. comment on the effect of health insurance coverage on health outcomes, "Insurance coverage is strongly related to better health outcomes for both children and adults when it makes health care affordable and helps consumers use care appropriately." They note specifically that having insurance, "helps people obtain preventive and screening services, prescription drug benefits, mental health and other services, and improves continuity of care." Furthermore, the effect of having health insurance extends to other areas as well, "Insurance coverage can also improve social and economic well-being, by averting developmental problems in children, increasing workforce productivity, decreasing use of hospital services, and reducing costs of public programs" (Bernstein *et al.*, 2010).

Looking at the percent of uninsured adults may provide a broader view of potential disparity in the region (Figure 9) than reviewing children's insurance coverage (Figures 10 & 11). According to an article published by the American Medical Association, public coverage (Medicaid and the Children's Health Insurance Program) helped reduce the percentage of uninsured children in 2009, while adults were almost twice as likely to be uninsured (Trapp, 2010).

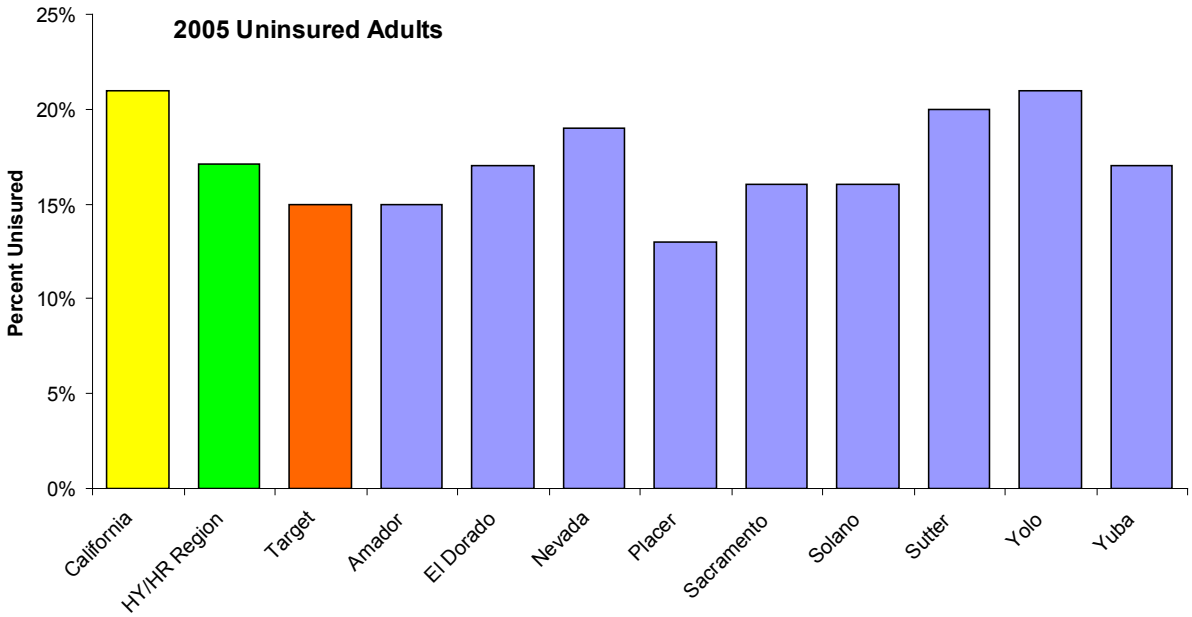


Figure 9: This is the estimated percent of the adult population under the age of 65 that has no health insurance coverage. Data come from the Small Area Health Insurance Estimates from the U.S. Census Bureau via RWJ CHR (Robert Wood Johnson Foundation, 2010).

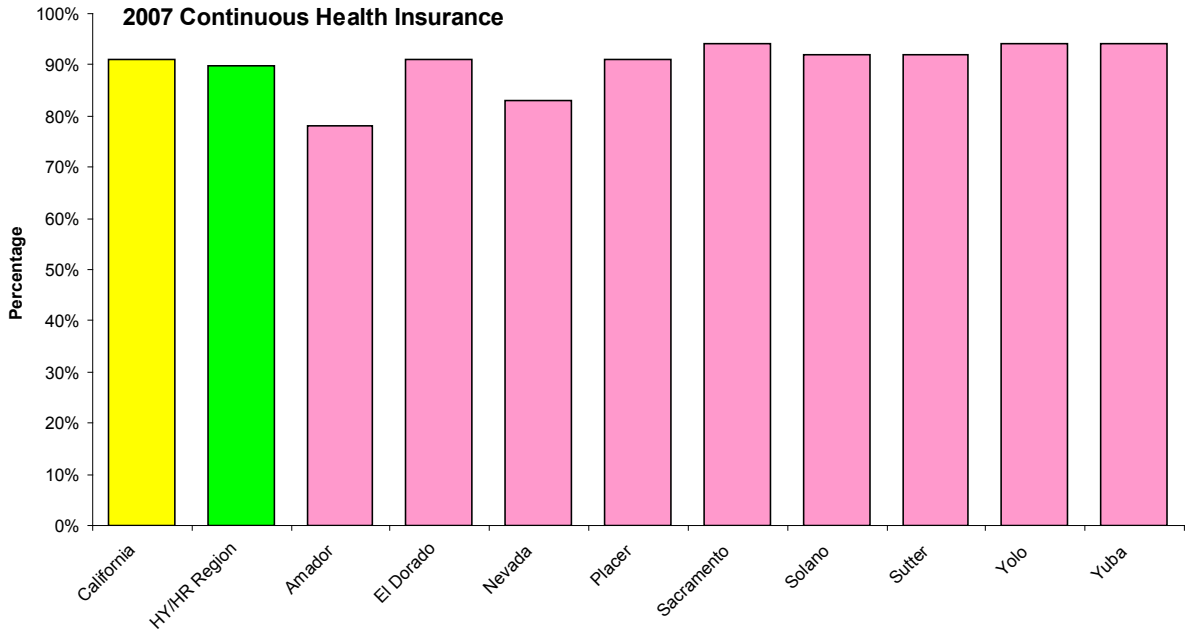


Figure 10: This indicator measures the percentage of children ages 0-17 that have continuous health insurance coverage throughout the year. Data come from the California Health Interview Survey via The Annie E. Casey Foundation's Kids Count (AEC KC) website.

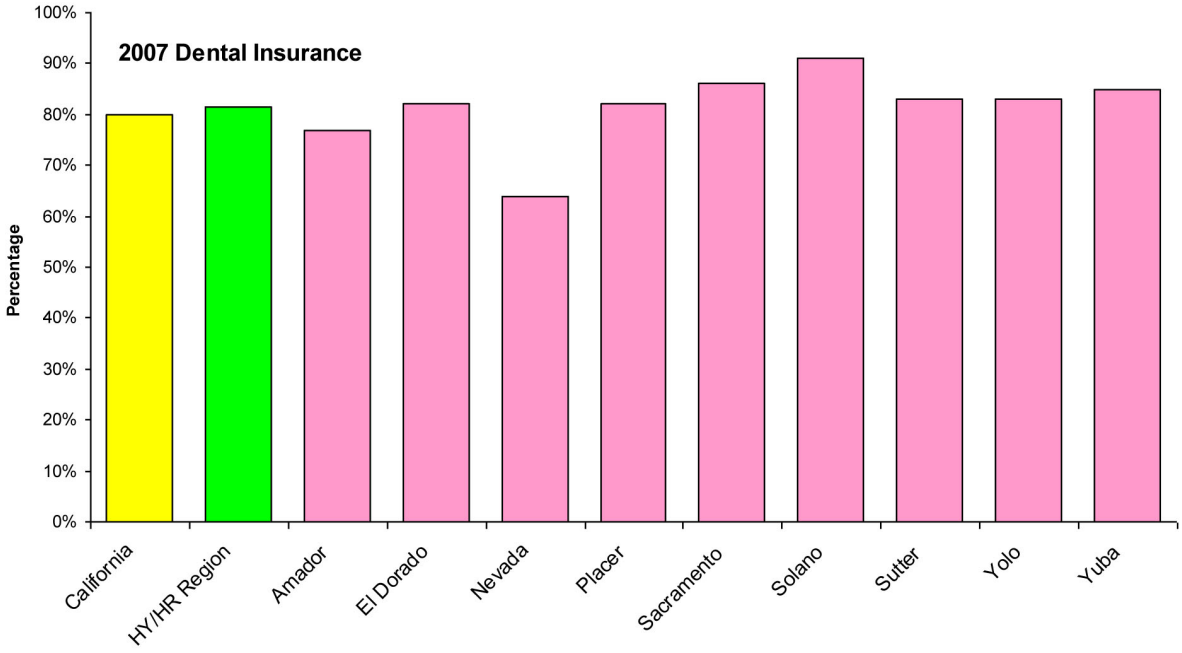


Figure 11: This indicator includes children ages 2-17 who have dental insurance. Data come from the California Health Interview Survey via AEC KC.

A community's primary care provider rate is important to ensuring individual needs for preventive care, primary care and specialist referral when needed (Robert Wood Johnson Foundation, 2010) (Figure 12).

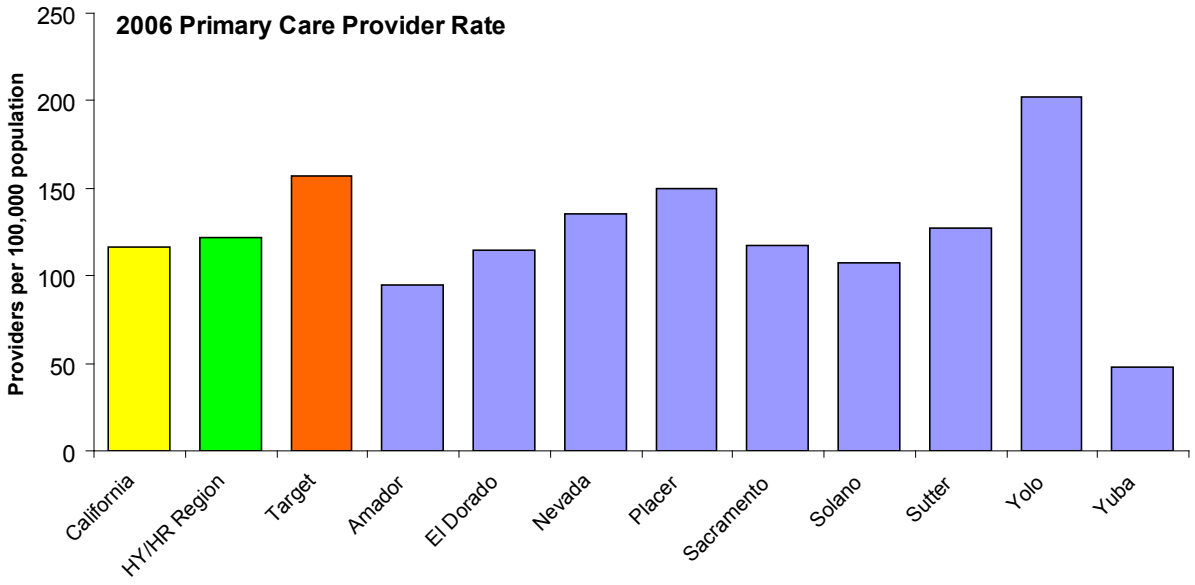


Figure 12: Primary care providers are those specializing in family medicine, internal medicine, pediatrics, and obstetrics/gynecology. Data on primary care providers come from the Health Resources and Services Administration's Area Resource File (ARF) for 2007. The ARF data on practicing physicians come from the AMA Master File (2006), and the population estimates are from the U.S. Census Bureau's 2006 population estimates, all via the RWJ CHR (Robert Wood Johnson Foundation, 2010).

Worldwide oral health is an important public health issue, particularly early childhood caries (cavities). The term 'pandemic' has been used to describe dental caries due to its high prevalence and often severe, though non-fatal consequences. Some of those consequences include impaired functions of eating, sleeping, speaking, being productive and enjoying general health (Edelstein 2006). Researchers have found that in California, the prevalence of childhood caries is particularly high in some low-income racial/ethnic populations. For all preschool children, the prevalence was 14%, but higher in children from low-income families enrolled in Head Start programs: 44% among Asians and 38% among Latinos (Pollick et al., 1999 and Shiboski et al., 2003). Since dental caries are preventable, potential causes for these disparities include dietary differences, access to fluoridated water, and the availability of dentists (Edelstein, 2006) (Figure 13).

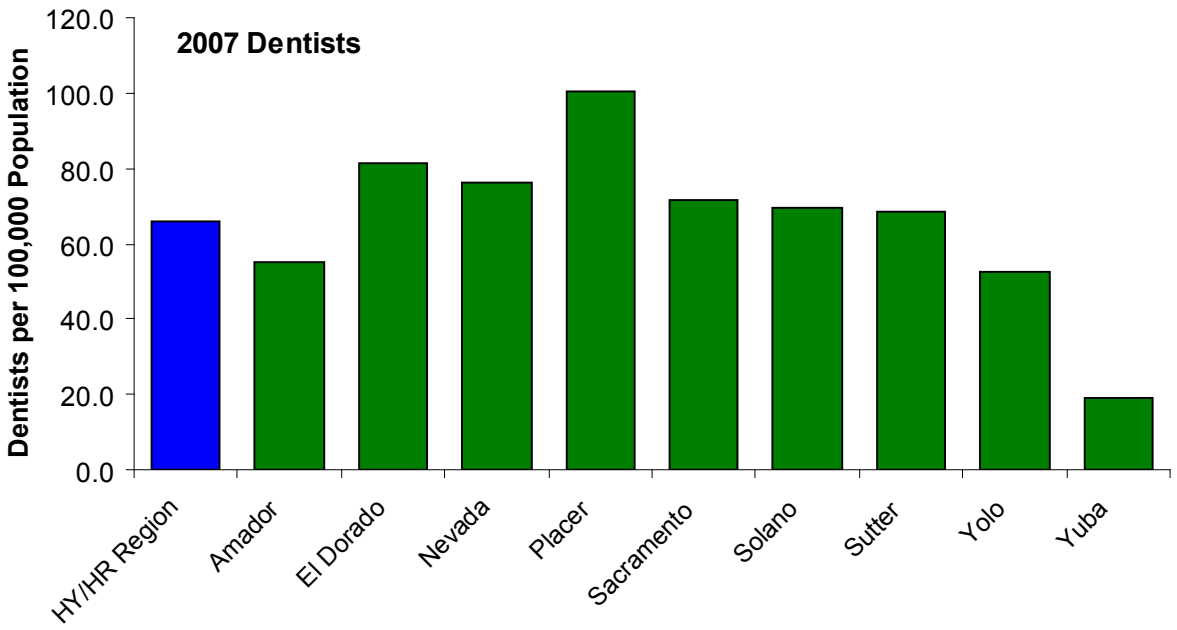


Figure 13: This is the total number of active dentists per 100,000 population, 2007. Data come from the American Dental Association, State and County Demographic Reports, 2007, Area Resource File, Health Resources and Services Administration, 2008; www.arfsys.com via the CHSI.

Summary of health care delivery:

The ability of an individual to achieve good health depends, in part, on their ability to access health care services when needed for illness or disease prevention. In the Capital Region:

- Placer County provides the best access to healthcare providers.
- Amador County is comparatively behind in both providers and insurance coverage for young people. Nevada County is also behind in insurance coverage while Yuba County is in need of more healthcare providers.
- Young people have less access to dental insurance than health insurance coverage.
- The primary care provider rate is under target levels for most counties.

Social Support Issues

Social support has been said to be so important to physical and mental health that its absence can be used to predict health deterioration. For adolescents, parental, and in some cases, extended family support is both expected (such as economic support) and needed (psychosocial support). Poor family support, minimal contact with others, and limited involvement in community life are associated with increased morbidity and early mortality, whereas individuals who are involved in social networks are more likely to participate in healthy lifestyle choices (Robert Wood Johnson Foundation, 2010).

In the graphs that follow, several aspects of social support (and lack thereof) are explained. For a broader view of adolescent connectedness, the reader should also review Romero, London and Erbstein (2010) , Owens *et al.* (2010) , and Burciaga and Erbstein (2010) to understand patterns of youth enfranchisement, agency and the voice through life stories and their suggestions for social change in the Capital Region.

Figure 14, though it represents adults, shows a county level overview of the percentage of individuals who felt they were not getting the support they need.

Adults feeling inadequately supported may themselves be less able to support their children. Economically, many adults are experiencing increased distress due to high unemployment rates in the region. By itself, unemployment can lead to physical health consequences ranging from illness to increased mortality, especially from suicide. Unemployment has also been associated

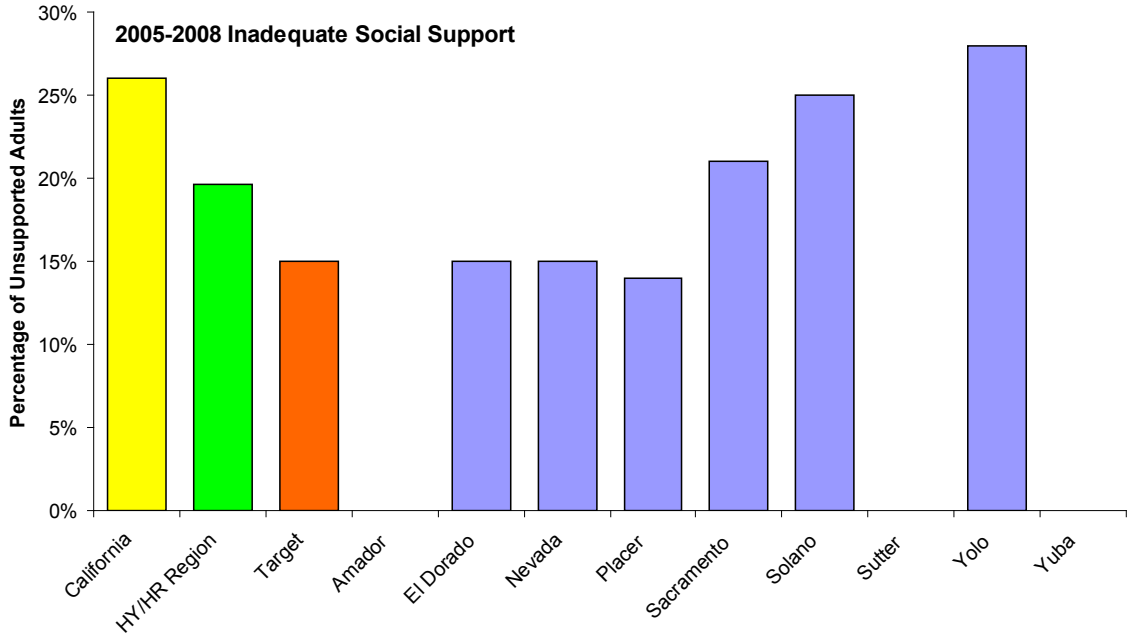


Figure 14: Using the Behavioral Risk Factor Surveillance Survey via RWJ CHR[5], this indicator is based on the response to the question, "How often do you get the social and emotional support you need?" Data show the percent of the population that answered "never," "rarely," or "sometimes." Amador, Sutter and Yuba counties have no data. Of note, social support issues in the Capital Region are addressed in the paper by Geraghty et al., (2010).

with unhealthy behaviors such as alcohol and tobacco use, unhealthy diet, and physical inactivity (Robert Wood Johnson Foundation, 2010). And since employee-sponsored health insurance is the most common source of health insurance coverage, unemployment can limit access to health care (Robert Wood Johnson Foundation, 2010). So, addressing labor market disparities that exclude certain populations from economic opportunity and health insurance coverage could positively impact health outcomes. To better understand the labor market opportunities for youth in the Capital Region, please refer to the paper by Benner et al. (2010).

Whether or not individuals have gainful employment, there can still be disparities in population health outcomes when the income distribution in a population is unequal. A review article addressing this issue found that societies with larger income differences were correlated with worse health outcomes. The findings were stronger in larger areas because, they postulate, the income inequality serves as a measure of the scale of social stratification or how hierarchical the society is (Wilkinson & Pickett, 2006). To measure income inequality, the Gini coefficient is used. This represents the inequitable distribution of income in a community by household, and can range from 0 to 1, where zero indicates a completely equal distribution of income among households and 1 would indicate that all of the income in a society is concentrated in one household (Figure 15).

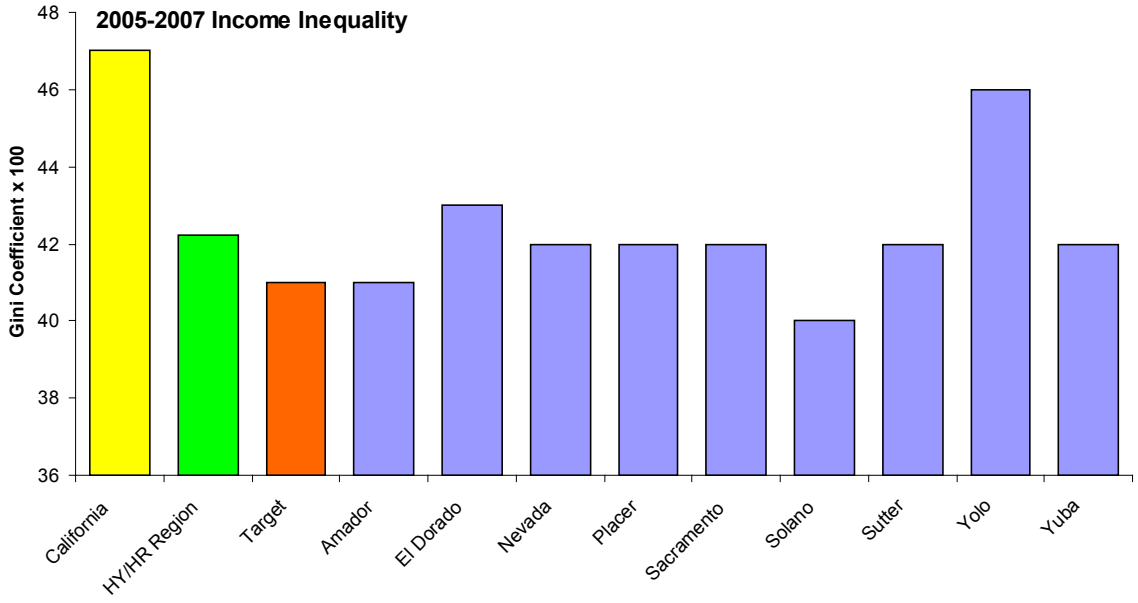


Figure 15: Income inequality measured by the Gini coefficient and normalized by multiplying by 100. Data come from 2005-2007 American Community Survey estimates of income inequality via RWJ CHR (Robert Wood Johnson Foundation, 2010).

While income inequality is modestly related to health outcomes, poverty, in general, is strongly related to health consequences like increased risk of mortality, increased disease incidence, depression, intimate partner violence and poor health behaviors (Robert Wood Johnson Foundation, 2010). Children in poverty (Figure 16) suffer even greater morbidity and mortality due to increased risk of accidental injury and lack of healthcare access. A question that remains is whether the link between poverty and health is direct or indirect. It is clear that economic status factors into school persistence (see Breslau et al., 2010). And the relationship between increasing education attainment and improved health outcomes has been documented (Robert Wood Johnson Foundation, 2010).

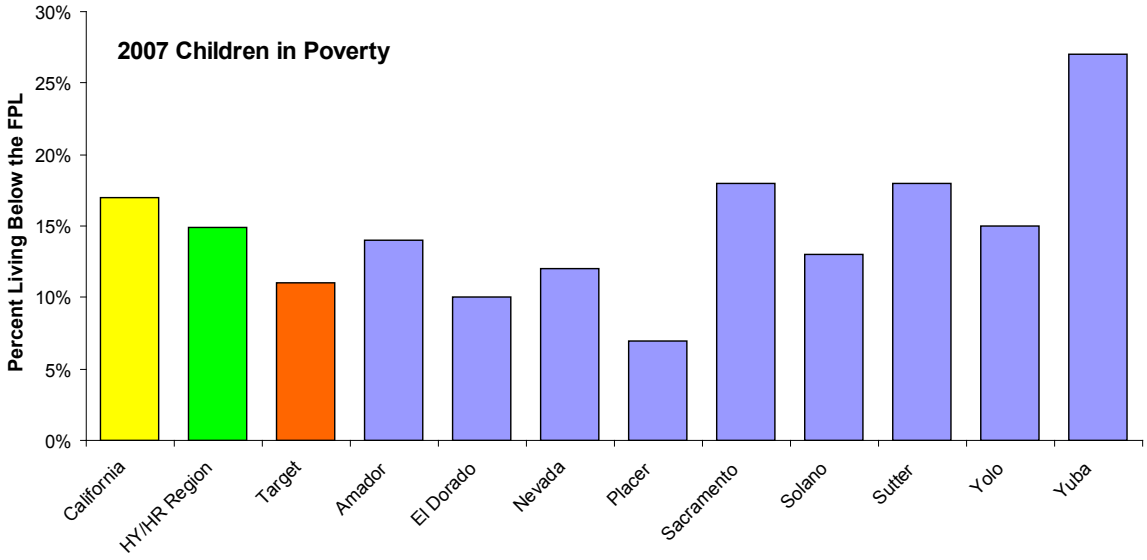


Figure 16: The percentage of children under the age of 18 who are living at or below the Federal Poverty Line (FPL). Data come from the Small Area Income and Poverty Estimates (SAIPE) program through the U.S. Census via RWJ CHR (Robert Wood Johnson Foundation 2010).

Therefore, it may be that the increase in adverse health outcomes for children in poverty is related to the poor educational achievement associated with poverty (Benner *et al.*, 2010). More research in this area may be needed to distinguish the level of contribution that both income and education attainment play in youth health status.

One common driver of child poverty is growing up in a single parent household. Children in single-parent households are at risk for adverse health outcomes such as mental health problems (including substance abuse, depression, and suicide) and unhealthy behaviors like smoking and excessive alcohol use (Robert Wood Johnson Foundation, 2010) (Figure 17).

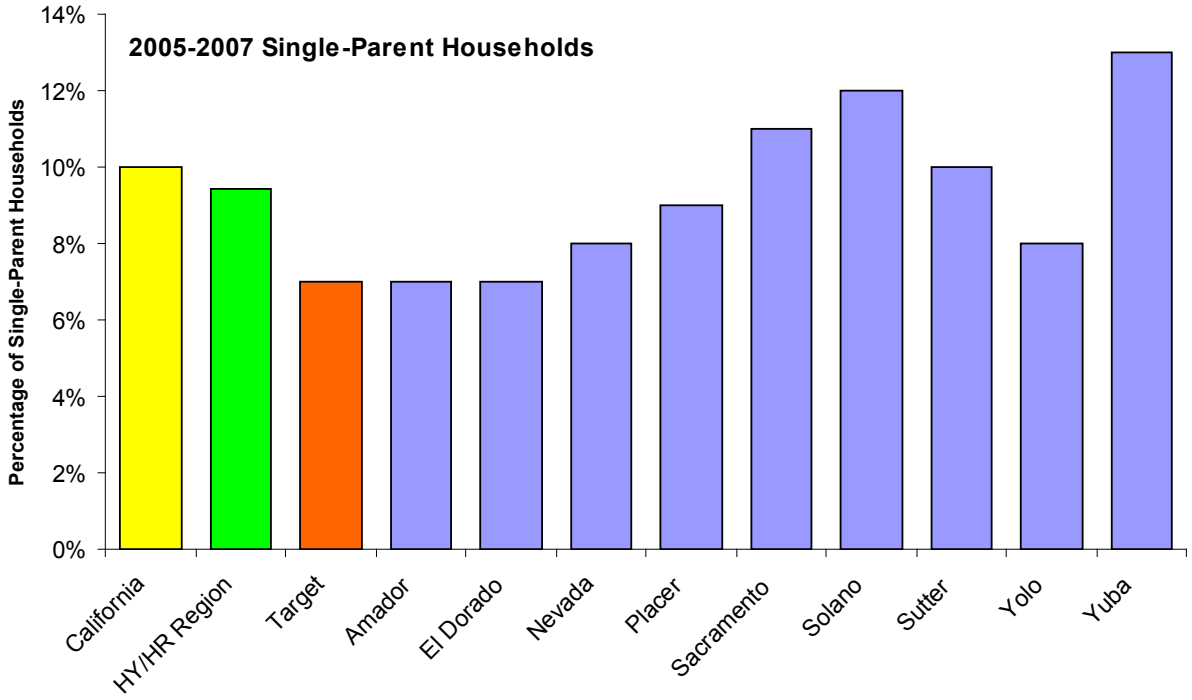


Figure 17: The percent of all households run by a single parent, whether male or female, with one or more children under the age of 18 living at home. Data are from the U.S. Census Bureau's American Community Survey via RWJ CHR (Robert Wood Johnson Foundation 2010).

At the extreme of youth who experience inadequate social support are children victimized by physical or mental abuse and neglect. Health effects can be immediate (injuries), but may also manifest as more insidious damage over the lifespan of the abused person. The lasting effects of abuse experienced before the age of 18 include both physical and mental symptoms (Table 1) (Bonomi et al., 2008a).

Table 1. Physical and Mental Health Effects of Child Abuse

Physical
Cardiovascular symptoms
Obesity
Gynecological disorders in women
Gastrointestinal symptoms
Pain syndromes
Mental
Depression
Panic
Post-traumatic stress disorder
Anxiety

Researchers have found that repeated abuse may lead to structural changes in the brain that may then mediate some of the functional consequences seen in individuals with a history of abuse (Grassi-Oliviera et al., 2008b). Healthcare costs and utilization rates have also been shown to be higher in adult women who were physically and/or sexually abused as children (Bonomi et al., 2008b). The cycle of abuse in a community may predict poorer health in that area as children grow up.

The University of California at Berkeley in collaboration with the California Department of Social Services created the Child Welfare Dynamic Reporting system(2009). They collect data and create reports on several areas of child welfare, including substantiated cases of child abuse (Figure 18). In the Capital Region, both Sacramento and Yuba counties have consistently had higher child abuse rates compared to the state average. For most counties, the child abuse rates are relatively stable over time. Of concern is El Dorado County where the child abuse rates have trended up between 1998 and 2009. In contrast, Placer and Sutter counties have shown decreasing trends over time.

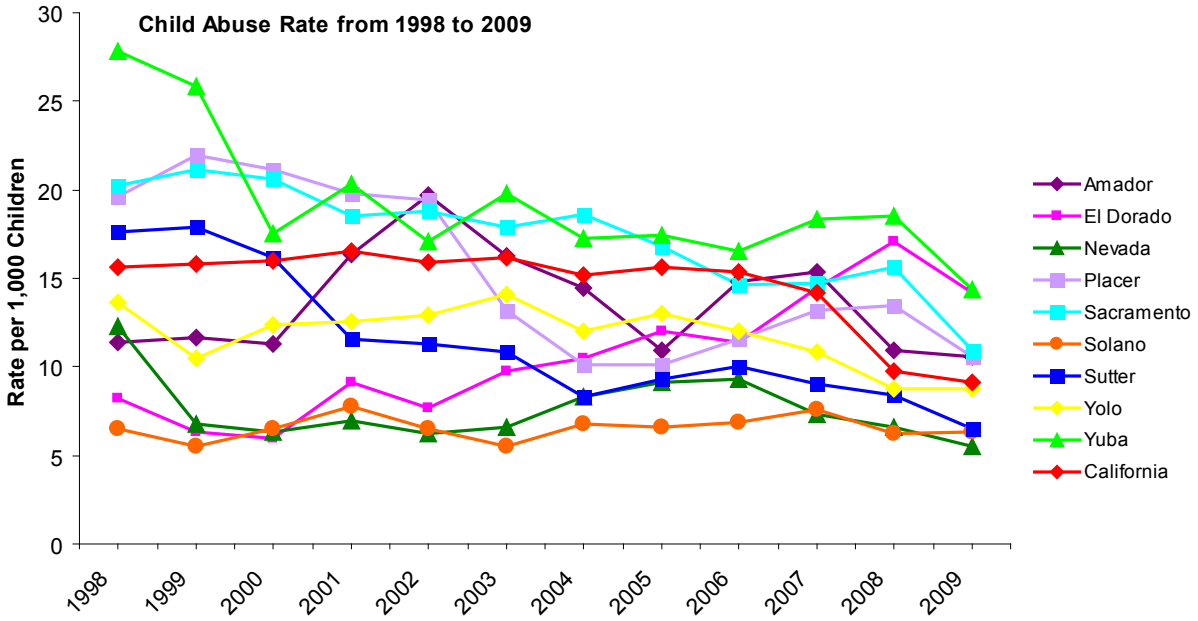


Figure 18: Child abuse rates measure the rate per 1,000 children ages 0-17 who are reported to have experienced substantiated abuse (sexual, physical or emotional) or neglect. Data come from the UC Berkeley Child Welfare Dynamic Reporting System.

Fortunately there is some evidence to support early childhood interventions that may help to prevent child maltreatment (Reynolds et al., 2009). Those interventions need to be targeted to provide the greatest benefit. The research literature points to a racial/ethnic disproportionality such that children of color are more often involved with the child welfare system than white children (Osterling et al 2008). Thus interventions should be targeted to include the highest risk groups.

Social support for youth is not only achieved by reducing or eliminating deficits like economic factors and childhood maltreatment, but can be accomplished by providing opportunities for youth to spend their time in positive ways. One of the REACH Youth Media Documentaries tells a story from the city of Galt in, "Small City, Big Problem: What would you do about it?" Youth talk about the "lack of supports and opportunities of youth within our community." Without places to go and 'hang out' together, youth note that "teens wander around town with nothing to do and get in trouble." Particular concerns centered around alcohol. Based on the California Healthy Kids Survey 2007, 60% of kids from the Galt Joint Union High School District surveyed answered that they have consumed alcohol at least once in their lifetime and 40% of students in grades 9 to 11 had used alcohol in the last 30 days. The teens in Galt felt that if they had a community center, they would use it, eliminating their 'boredom' and keeping them 'out of trouble.' Likewise, in West Sacramento, teens participating in the 'Youth Voices for Change' component of this research listed their teen center as a favorite place. Young people stated that the Collings Teen Center "made a difference in my life," and "without this teen center, I would be nowhere."

Summary of social support issues:

Having adequate social support improves the likelihood that a young person will adopt healthy lifestyle choices. In the Capital Region:

- El Dorado, Placer, Nevada, Amador and Solano counties appear to enjoy the highest levels of social support in the region.
- Yuba County has inadequate social support by the measures reported. Sacramento and Yolo counties also do poorly in this category.
- Additional qualitative data, expanding on the 'lack of support' perspective in the region can be found in Rios *et al.*, (2010).
- Income inequality, while not at target levels, is relatively flat in the region except for Yolo County. The concept of a more even distribution of wealth in this area may add credence to the argument for regional cohesion, particularly in comparing the regional average to the California state average (London *et al.*, 2010).
- Creating and promoting opportunities for teens to get together and spend their time in constructive activities can provide needed social support.

According to the World Health Organization (2010), one quarter of all preventable diseases are directly caused by environmental factors worldwide. As many as four million children's lives per year could be saved by preventing environmental risk. Although children in developing countries are at greater risk of death from environmental factors than those in the United States, there is no question that a young person's health can be significantly impacted, either positively or negatively, by the physical space in which they live.

Research has shown that there is a relationship between physical activity and access to safe parks, particularly among urban adolescents (Babey et al., 2008). In the Capital Region, youth voiced their desire to have affordable and convenient recreation in natural settings, like parks, available to them (Owens *et al.*, 2010). But according to the youth and adults interviewed in this study, access to such places can be an issue, particularly in low-income neighborhoods (Rios *et al.*, 2010).

An important environmental insult to health is air pollution. This is a special concern for youth since there has been evidence that higher levels of air pollution have chronic, adverse effects on lung development in children from the age of 10-18 years, leading to clinically significant deficits in measures of lung capacity as children reach adulthood (Gauderman *et al.*, 2004). While all of the criteria pollutants can cause negative health effects (Barnett *et al.*, 2005) particulate matter pollution and ozone are major culprits. The health consequences for youth include decreased lung function and asthma exacerbation, sometimes requiring emergency room treatment.

A collaborative project between the Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) called PHASE (Public Health Air Surveillance Evaluation) provides estimates of the number of days per year that air quality in a county was unhealthy for sensitive populations due to fine particulate matter (FPM, < 2.5 µm in diameter) (Figure 19) and/or ozone (Figure 20).

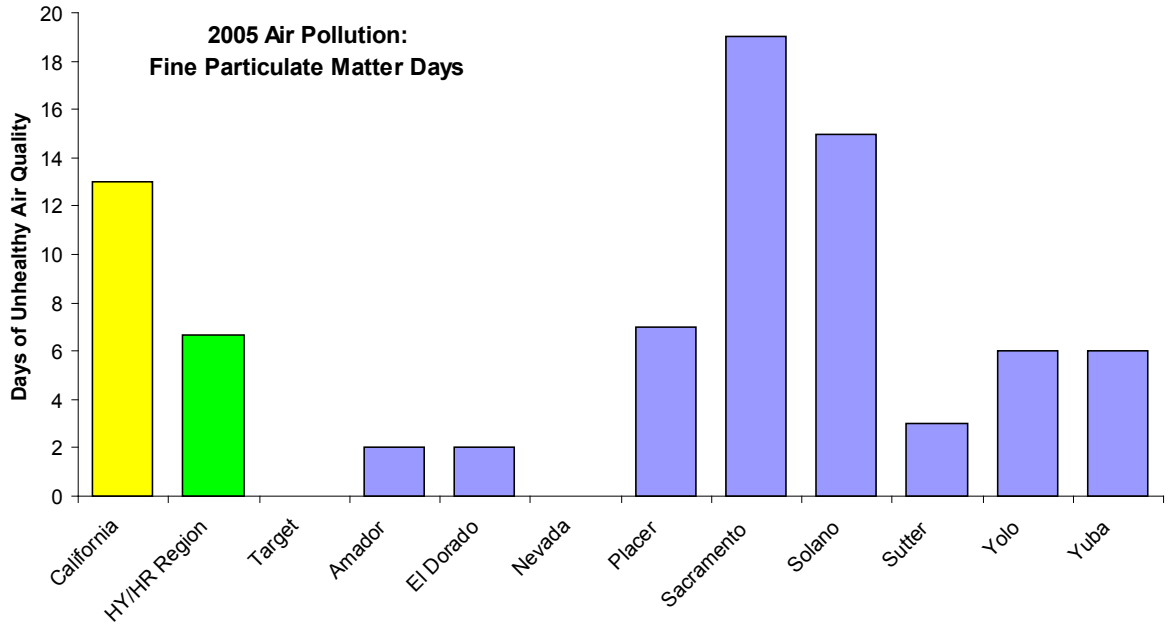


Figure 19: The number of days in 2005 in which FPM was considered unhealthy for sensitive populations. The target for this indicator is zero and Nevada County had no unhealthy FPM days. Data come from the PHASE project via RWJ CHR (Robert Wood Johnson Foundation, 2010).

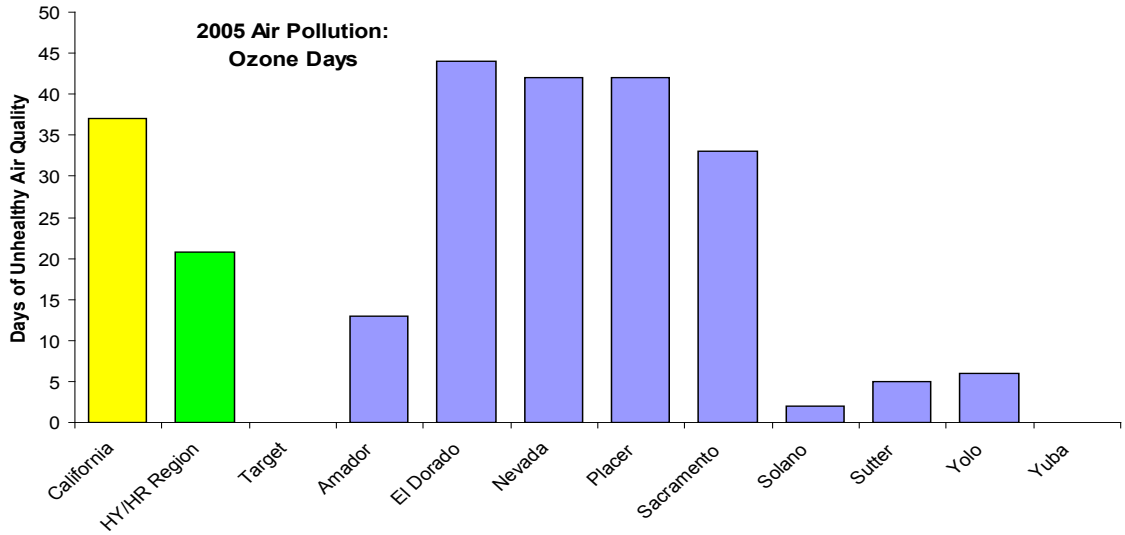


Figure 20: The number of days in 2005 in which ozone was considered unhealthy for sensitive populations. The target for this indicator is zero and Yuba County had no unhealthy ozone days. Data come from the PHASE project via RWJ CHR (Robert Wood Johnson Foundation, 2010).

In addition to the air we breathe, the food we eat is related to our overall health outcomes. One way to measure access to healthy foods is to measure the percentage of zip codes within a county that have a healthy food outlet, defined as a grocery store or produce stand/farmer's market (Figure 21).

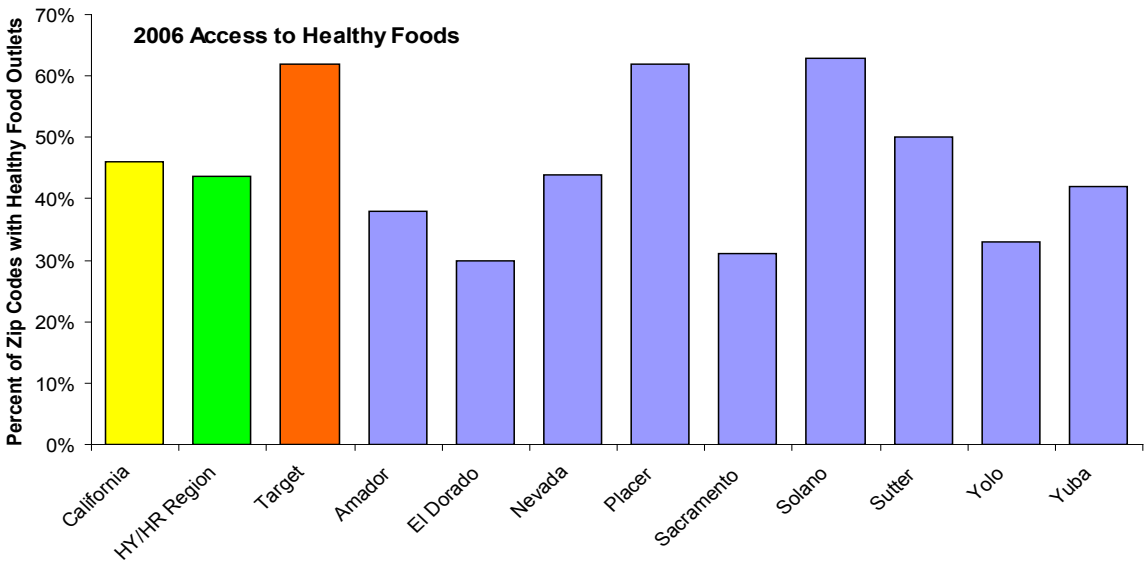


Figure 21: This indicator measures the percentage of the zip codes in a county that have access to a healthy food outlet such as a grocery store, produce stand or a farmer's market. Data come from the U.S. Census Bureau's Zip Code Business Patterns for 2006 and healthy food outlets were chosen based on their North American Industrial Classification (NACIS) codes, all downloaded via RWJ CHR (Robert Wood Johnson Foundation, 2010).

While having better access to healthy foods promotes good health, the physical availability of alcohol has been associated with poor health consequences such as: violence, motor vehicle accidents, mortality due to liver cirrhosis and binge drinking. Liquor store density is one way to measure the availability of alcohol. Liquor stores provide the opportunity for individuals to purchase much larger quantities of alcohol than might be obtained in taverns and restaurants that sell alcohol for immediate consumption (Figure 22). Please also see the section in this paper related to mental health and substance use in the region for more details about how the Capital Region compares to other areas in the state for alcohol consumption. In addition, data related to violence and motor vehicle accidents are provided in the excess death section of this paper.

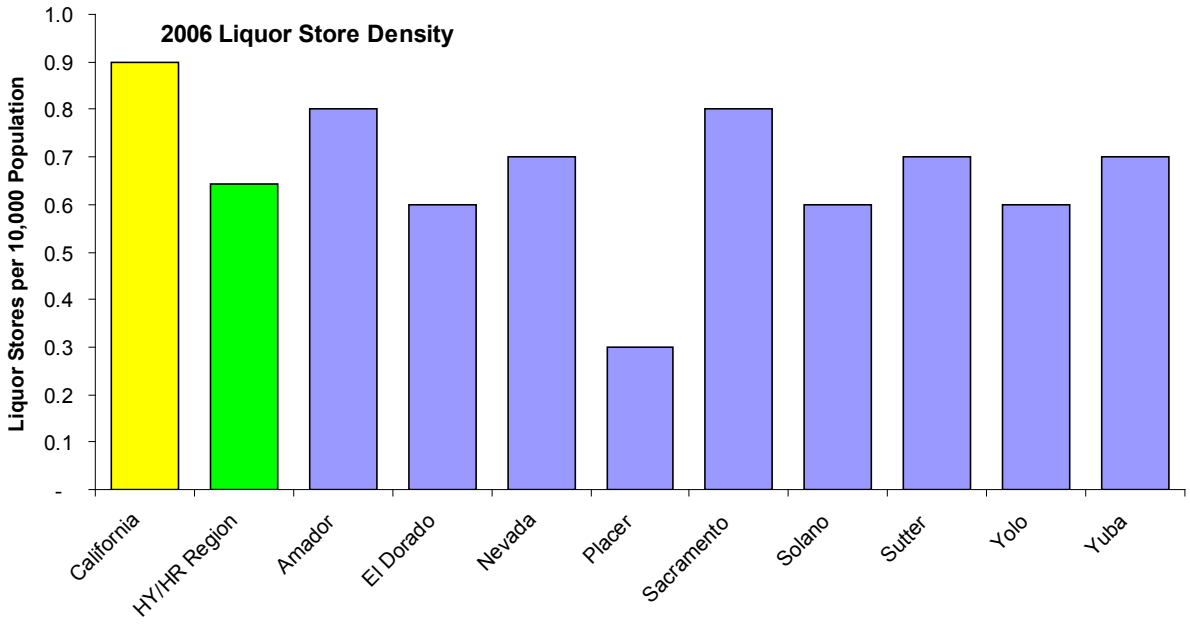


Figure 22: The number of liquor stores per 10,000 population. Data come from the U.S. Census Bureau's Zip Code Business Patterns for 2006 and liquor stores were defined based on their North American Industrial Classification (NACIS) code, all downloaded via RWJ CHR (Robert Wood Johnson Foundation 2010).

Summary of the physical environment:

Where people live and what they are and are not exposed to can impact immediate and long term health.

- The picture is mixed. Many counties do particularly well in some areas but less well in others (e.g., Placer has excellent healthy food access but high levels of ozone).
- Sacramento County does less well in all categories of physical environment relative to other counties in the Capital Region.

The health behaviors that youth establish in childhood and adolescence often persist into adulthood. When those behaviors are negative, their consequences range from the individual's personal health to the development of educational and social problems that confront the nation, including failure to complete high school, unemployment and crime (Centers for Disease Control, 2008). When these behaviors are positive (such as always wearing a seatbelt, drug and alcohol abstinence and not riding in cars with drivers who have been drinking) lifetime risk for illness, injury and premature mortality is significantly decreased. Not only is long term health improved, but research has shown that a reduction in the prevalence of health risk behaviors among young people can positively affect academic performance (Murray et al., 2007; Taras, 2005a; and Taras, 2005b).

Smoking is perhaps the most well-known behavior that can lead to multiple chronic conditions and even death. The prevalence of adults who smoke has important implications for youth in the region since secondhand smoke often causes premature death and disease in children (Figure 23). In the United States, children are more heavily exposed to secondhand smoke than nonsmoking adults. According to the 2006 Surgeon General's report, 60% of U.S. children aged 3 to 11 years (nearly 22 million young people) are exposed to secondhand smoke Centers for Disease Control, 2007). Some of the key scientific findings included in the report were:

- Because their bodies are developing, infants and young children are especially vulnerable to the poisons in secondhand smoke.
- Both babies whose mothers smoke while pregnant and babies who are exposed to secondhand smoke after birth are more likely to die from sudden infant death syndrome (SIDS) than babies who are not exposed to cigarette smoke.
- Mothers who are exposed to secondhand smoke while pregnant are more likely to have lower birth weight babies, which makes babies weaker and increases the risk for many health problems. They are also likely to have weaker lungs than other babies, increasing their risk for health problems.
- Secondhand smoke exposure causes acute lower respiratory infections such as bronchitis and pneumonia in young children and increases the frequency and severity of asthma attacks in children with asthma.
- Children exposed to secondhand smoke also have increased risk for ear infections and are more likely to need an operation to insert ear tubes for drainage (Centers for Disease Control, 2007).

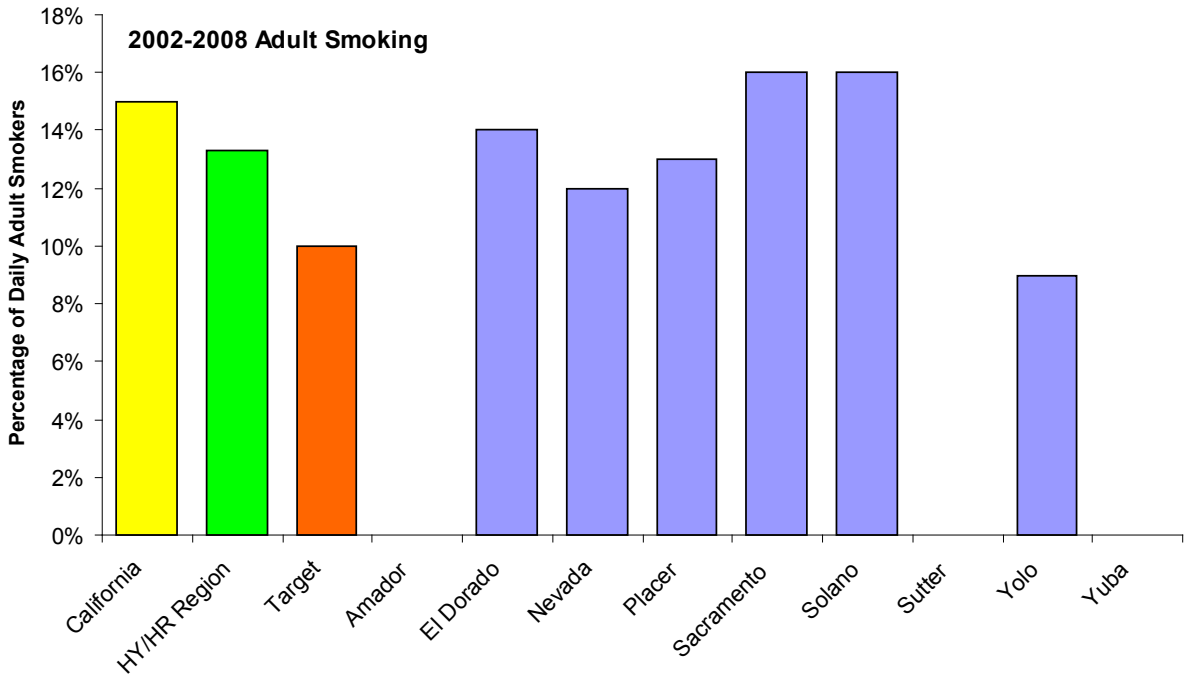


Figure 23: This indicator is based on adult prevalence of smokers and is shown as the percentage of the adult population who smoke every day or "most days" and has smoked at least 100 cigarettes in their lifetime. Data come from the Behavioral Risk Factor Surveillance System via RWJ CHR (Robert Wood Johnson Foundation, 2010). Sample sizes in Amador, Sutter and Yuba counties were too small to report.

These data can aid in assessing the need for additional cessation programs. California runs a very successful smoking cessation program. It offers the free California Smokers' Helpline (1-800-NO-BUTTS) that provides self-help materials, referral to local programs, and one-on-one telephone counseling to quit smoking. Since children are powerless to protect themselves from the dangers of secondhand smoke, adults must take responsibility:

- Keep homes and vehicles smoke-free (opening a window is not enough)
- Make sure day care centers and schools are 100% smoke- and tobacco-free
- Choose smoke-free restaurants
- Insist that no one smokes around children (Centers for Disease Control, 2007)

Adults and youth alike in the United States are suffering from increasing rates of obesity and overweight. This epidemic has significant short and long term health consequences such as: asthma, cardiovascular disease, hypertension, obstructive sleep apnea, diabetes, and social and economic disadvantages in adulthood. In adolescents, obesity can also lead to a poor self image, eating disorders and poor quality of life. For these reasons, preventive measures for overweight and obesity in youth is a public health priority (Ahn et al., 2008) (Figure 24).

According to a study done by Ahn, *et al.*(2008), 29% of California adolescents are at risk for overweight or obesity. Since there were significant differences by gender and racial/ethnic groups, they indicate a need for culturally specific interventions for prevention and treatment of obesity.

They found that boys were at higher risk than girls, especially among Hispanic or American Indian/ Pacific Islander/other race/ethnicity, lower education of parents, and longer residence in the United States. Among girls, the rates were higher for Hispanic or black race/ethnicity and lower education of parents.

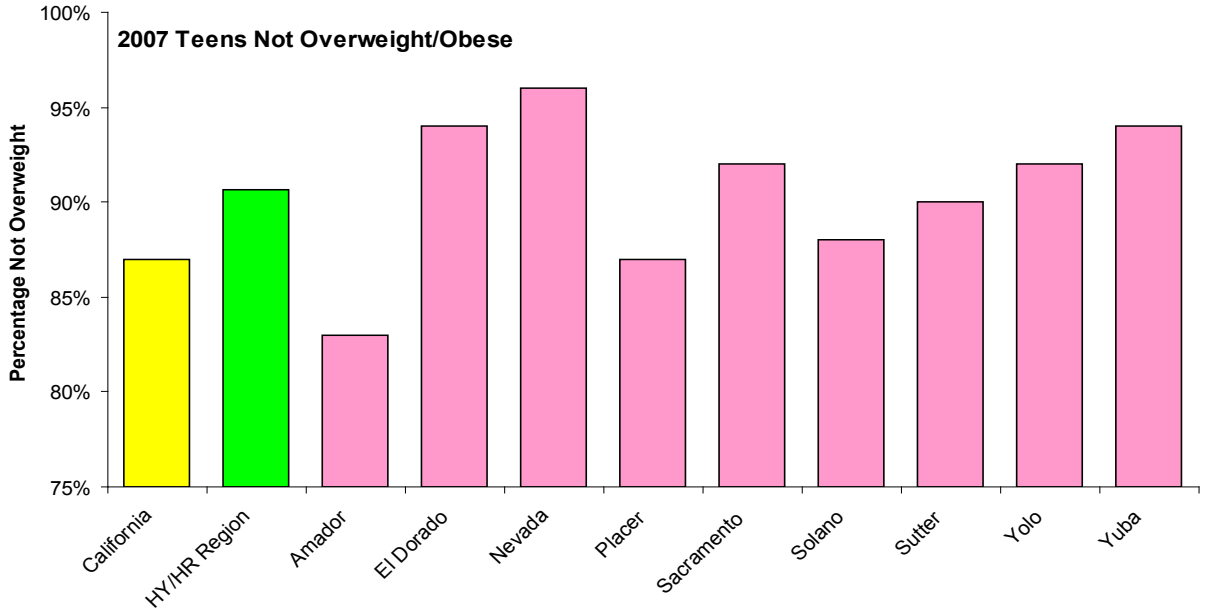


Figure 24: The percentage of teens ages 12-17 who are NOT overweight or obese. Data come from the California Health Interview Survey via Annie E. Casey Foundation (2010).

Overweight and obesity are difficult public health problems due to the multiple factors impacting the energy balance equation (weight = calorie consumption - calorie expenditure) such as the physical environment (see previous section) or health behaviors. Individuals may suffer from both or either the consumption of too many calories or physical inactivity. One risk factor for physical inactivity in youth is excessive television viewing (Figure 25). Television ads also have been shown to prompt viewers to desire foods with high fat and sugar content. Other negative health effects of television may include attention deficit disorder/attention deficit hyperactive disorder, emotional health issues (damaged self-esteem), and decreased manual dexterity (due to not spending time on other leisure activities like finger-painting, playing on a toy piano, or manipulating play dough).

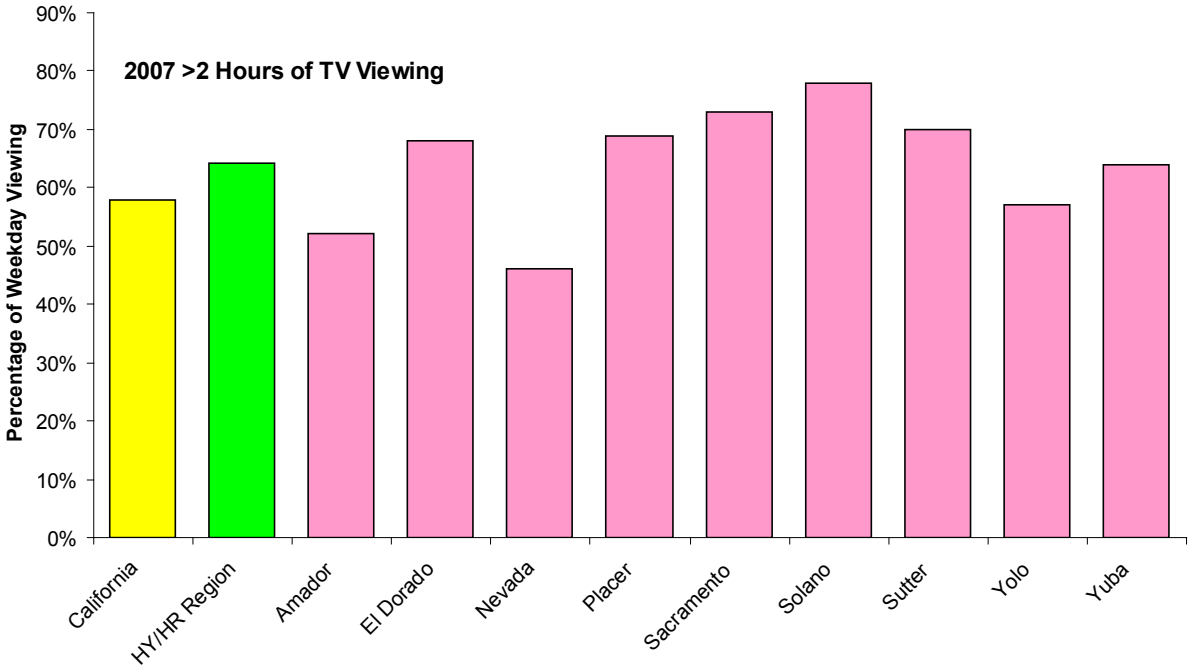


Figure 25: The percentage of teens ages 12-17 who watch greater than 2 hours of television on weekdays. Data come from the California Health Interview Survey via Annie E. Casey Foundation (2010).

Summary of health behaviors:

The CDC lists the priority youth health behaviors to address as: tobacco use, nutrition, physical activity, alcohol and drug use, injury and violence prevention (including suicide) and sexual risk behaviors. Each of these topics is addressed within this paper. For the measures included in this section, observations include:

- Nevada County does well in terms of less obesity and less excessive television viewing in kids.
- Sacramento and Solano counties have comparatively higher rates of adult tobacco use and excessive television viewing.

Up to this point, this paper has relied on county level data derived from state and/or national population surveys and statistics. These data provide a valuable, though limited view of health in the region and offer county level successes and disparities. However, questions of age, gender and race/ethnic disparity cannot be answered using these data. For two of the sections that follow, Teen Birth and Excess Death, more detailed, individual level data were obtained from the California Department of Health's Office of Vital Records. Therefore, more information and analyses were possible for these sections. Furthermore, as will be shown, teen birth and excess youth death have long lasting consequences for youth health in our region.

From the early 1990's to 2004/2005, teen birth rates in the United States dropped significantly (37%). In California, the drop was even more dramatic at 52% (Figure 26). A great deal of credit for this drop was given to California's decision to make teen pregnancy a high public policy priority. Heather Boonstra, author of an analysis on the success of California's pregnancy prevention policies noted, "Above all, California's success demonstrates that policies matter – both in allotting the necessary resources and in ensuring that the right types of information and services are available."

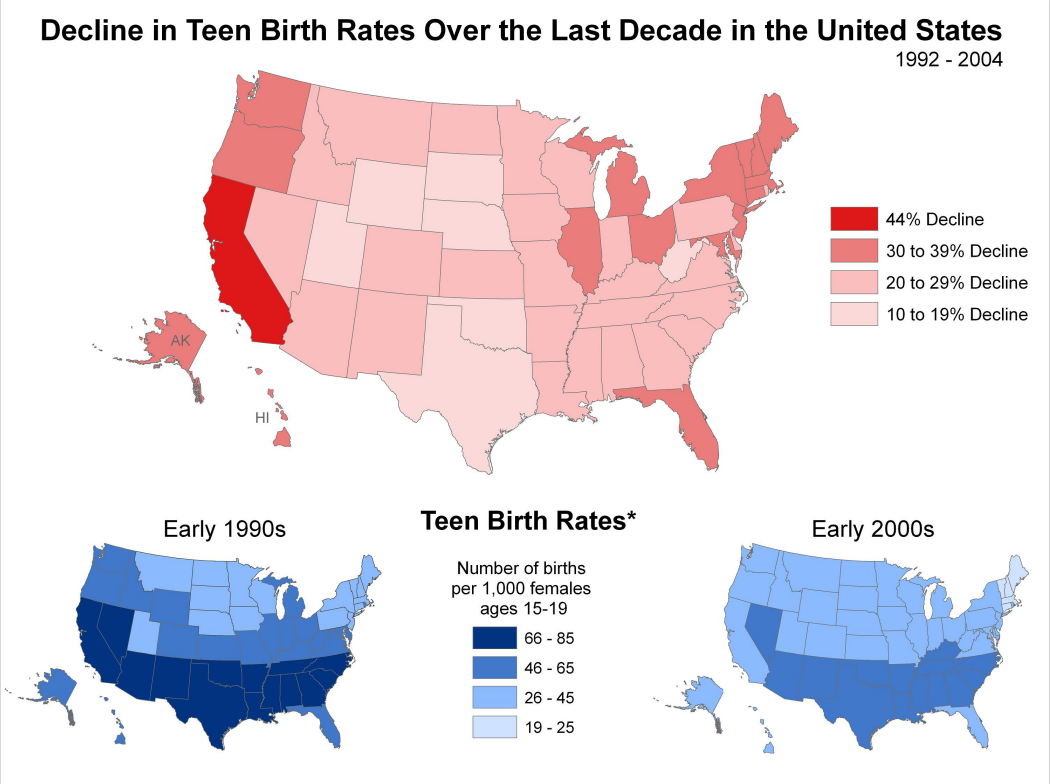


Figure 26: The maps explain the decline in teen birth rates across the country. California demonstrated a remarkable decrease in teen birth rates between the early 1990's and the early 2000's. Figure provided courtesy of Sandy Navarro.

Historically, the United States has always had higher teen birth rates when compared to other developed countries (Figure 27). Several historical events have influenced teen fertility trends in this country, leading to declines in teen birth rates (Figure 28). Examples include the FDA's approval of the birth control pill and the intra-uterine device (IUD) for contraception in 1960, the Supreme Court's legalization of abortion in 1972, and the HIV/AIDS pandemic beginning in the 1980s. But the most prominent change, an increase in the use of condoms, continued through the late 1980s, 1990s and early 2000s (Santelli et al., 2009). Despite the success of this behavior change, beginning in 1998, emphasis of U.S. national policy shifted from HIV education (and condom use) to a focus on teen abstinence from sexual behavior. In this case, the federal funding rules for abstinence-only programs required a focus on failure rates of condoms and contraception.

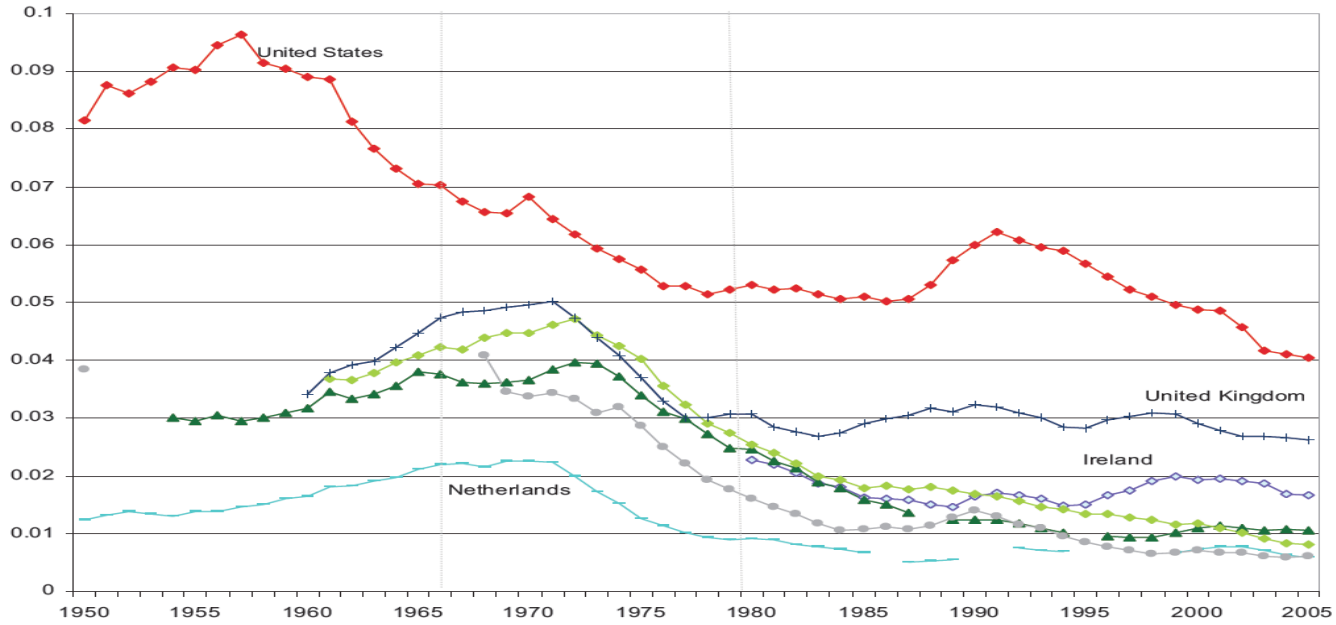


Figure 27: International teen birth rates. Over the last half century, the United States has consistently had higher teen birth rates than other developed countries. Figure from: Santelli, JS and Melnikas, AJ (2010).

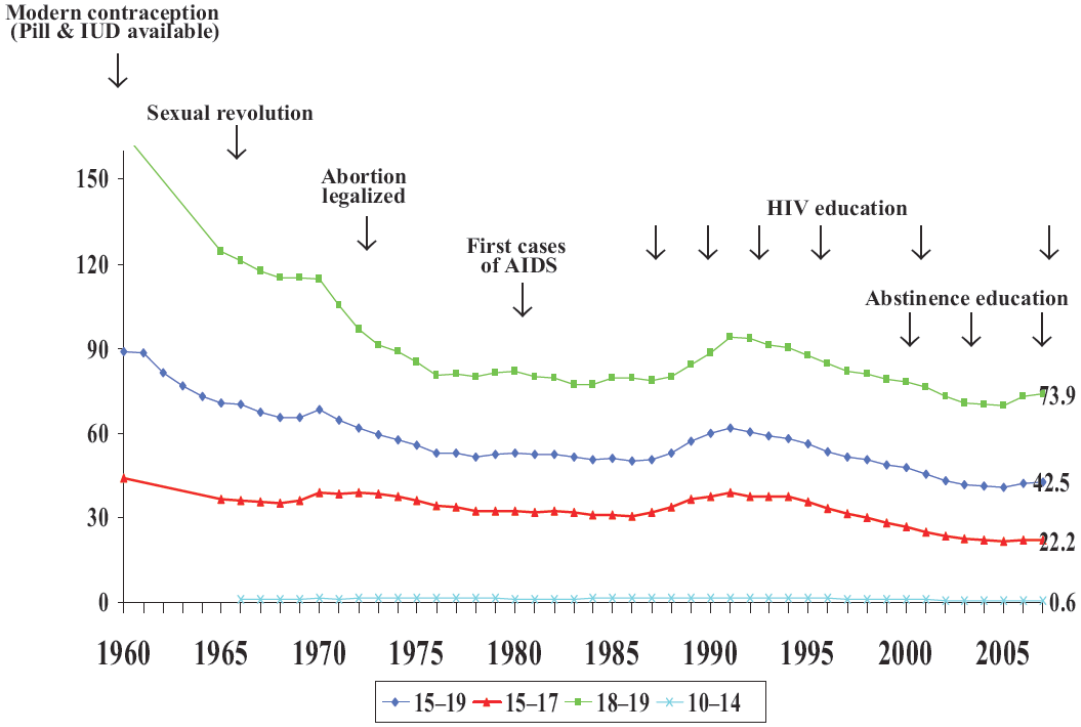


Figure 28: Historical trends affecting teen birth rates in the United States. Figure from: Santelli, JS and Melnikas, AJ (2010)

Unfortunately, over the past few years national teen birth rates have risen, 3% in 2006 and another 1% in 2007. Some feel that the abstinence-only approach undermined teen contraceptive use and resulted in the increased teen birth rates, particularly for the black and non-Hispanic white populations (up 2.4% and 2% respectively between 2005 and 2006) (Table 2) (Finn, 2010). On the other hand, policies like the Medicaid family planning waivers were found to reduce teen birth rates across all ages and races.

In the Capital Region, a similar trend has occurred when looking at teen births as a percentage of all births (Figure 29). From 1994 to 2004 a steady decline occurred (from 12.9% to 8.5%). There was some flattening of the curve during 2005 and 2006 (8.6%) and then an up tick in 2007 (8.9%). In 2008, a mild decline in teen births was noted (8.7%).

Table 2. Pregnancy Rate per 1,000 teens at risk for 1990, 2005 and 2006			
Race/Ethnicity	1990 Rate	2005 Rate	2006 Rate
Black	224	123	126
Hispanic	170	125	127
Non-Hispanic White	87	43	44

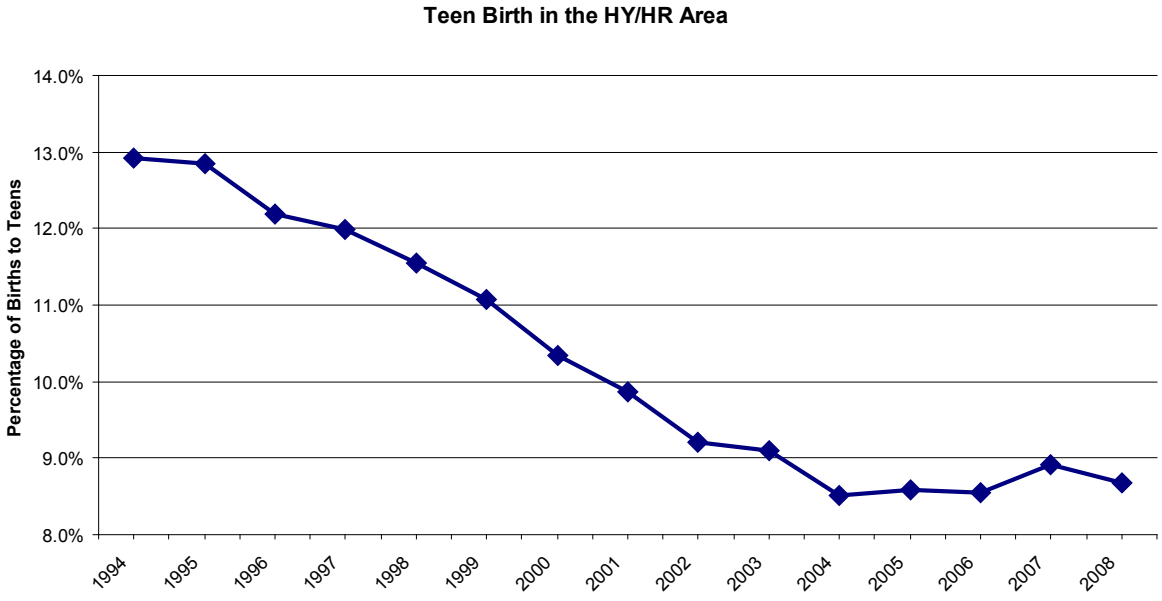


Figure 29: The percentage of births to teens in the Capital Region over time from 1994 to 2008.

Teen pregnancy and teen birth are problematic on many levels. Not only does teen pregnancy put an individual adolescent girl's health at risk, but teen pregnancy and birth also pose a threat to long term community health. Research suggests that improving reproductive health outcomes in one generation may help improve outcomes in the next (Manlove et al., 2008). The potential negative consequences of teen birth are outlined in the following paragraphs.

Teen mothers are more likely to drop out of high school. Thirty-four percent of young women who had been teen mothers did not earn a high school diploma or GED, compared with only 6% of young women who had not had a teen birth. Among women who did go back and earn a high school equivalency degree, most were black (67%), compared to white women (55%) and Hispanic women (46%). In addition, teen mothers are more likely to face unemployment, poverty, and welfare dependency. Those who do obtain jobs are likely to earn less money than similarly aged girls. The same is true for teen fathers. Teen mothers are also more likely to experience rapid repeat pregnancies and single motherhood (Santelli and Melnikas, 2010). There are also several health problems associated with teen pregnancy including: anemia, pregnancy-induced hypertension, placental problems, increased likelihood to have prolonged labor, and an increased death rate from

pregnancy complications in girls under the age of 15 years (Chen et al., 2007).

The infant children of teen mothers are more likely to be premature and prematurity is ranked second only to congenital anomalies as a major cause of infant death. Similarly, the infants of teen mothers are at high risk of having low birth or very low birth weight babies and all of the associated consequences related to lifetime developmental problems.

The children of teen mothers tend to do less well on health and social well-being than the children of older mothers. Both the male and female offspring of teen moms tend to have an earlier sexual debut and for the females an increased odds of teen birth.

In the United States, the annual cost of teen pregnancies from lost tax revenues, public assistance, child health care, foster care, and involvement with the criminal justice system was estimated to be about $9.1 billion in 2004. Assuming that cost could be evenly distributed among teens having babies, the economic burden to the Capital Region would be nearly $70 million dollars in 2004 alone. Notably, when the teen birth rates decreased, there was a significant decrease in the number of children living in poverty and living in single mother households.

The teen birth issue is addressed in the Healthy People 2010 initiative. Some of the goals related to teen birth are:

- Decrease teen pregnancy
- Decrease sexual activity among adolescents
- Increase youth condom and contraceptive use
- Increase prenatal care in the first trimester
- Reduce the number of low and very low birth weight babies

In the Capital Region, the teen birth rate (to women under the age of 18) was lower than the state and national averages during the period of 1994 to 2003. But in an examination of the rates by county, Yuba County had a significantly higher teen birth rate in all comparisons (Figure 30). Yet, when Yuba County was compared to other counties in the country that are more similar to it (peer counties), it was not statistically different.

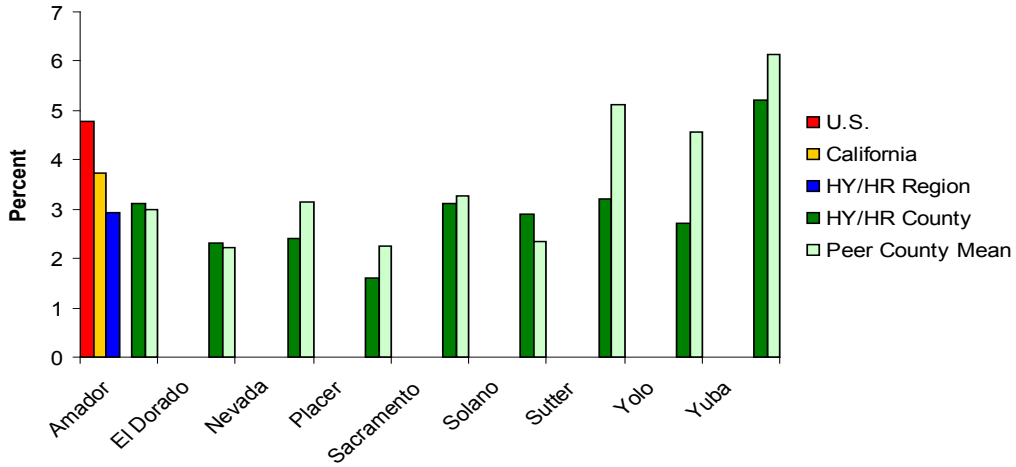


Figure 30: Births to women under 18 years of age. Data are from the National Center for Health Statistics, National Vital Statistics System; 1994-2003 via CHSI (US Dept of Health and Human Services).

Racial and ethnic differences exist for teen births in the Capital Region (Figure 31). Although the racial make up of the region includes 70% white girls between the ages of 10 and 19, only 56% of the teen births are to white young women. Conversely, Blacks and Asians make up 10% and 11% of the region's young female population, but are over-represented in teen births (12% and 20% respectively).

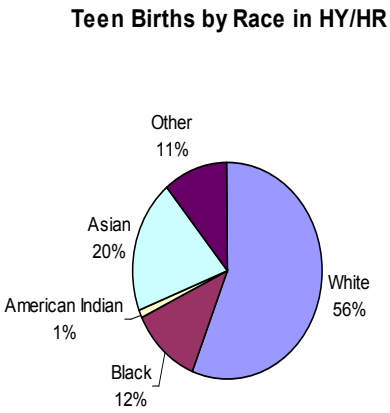


Figure 31: Teen births by race in the HY/HR study area. These figures represent the frequency of teen births by race as a percentage of all teen births.

Traditionally, young women of Latina descent in the United States exhibit higher rates of teen birth. This finding holds true in the Capital Region. While Latina women aged 10-19 account for 34% of the region's population, they represent 44% of the teen births. In the REACH Youth Media Project, a film entitled "Open Your Eyes: A Teen Pregnancy Prevention Documentary," reported on this issue in Woodland, CA, a city in Yolo County. According to the documentary, there were 214 teen births in Yolo County in 2007, 75% of those to Latina teens. The city of Woodland, one of only four incorporated cities in the county, has 28% of the county population, but 49% of the teen births.

When interviewed about why teens were having sex in Woodland, responses were all similar, "we want to fit in," "it seemed like everyone was doing it," and "it's the normal thing." According to "The National Campaign to Prevent Teen and Unplanned Pregnancy" (www.teenpregnancy.org) 49% of students report being sexually active, yet 63% said they wished they had waited longer. The documentary noted that parental discussions about sex are an important preventive strategy, but according to the documentary sex education is not often discussed in Latino families.

Prevention of teen pregnancy is an important goal in the U.S., but for those young women who do become pregnant, it is equally important to ensure that the health of the mother and unborn child is ensured through early prenatal care. Compared to the rest of the state, pregnant women of all ages in the region are less likely to obtain prenatal care in the first trimester (80%) than women living elsewhere in California (87%). Figure 32 highlights the issue by county.

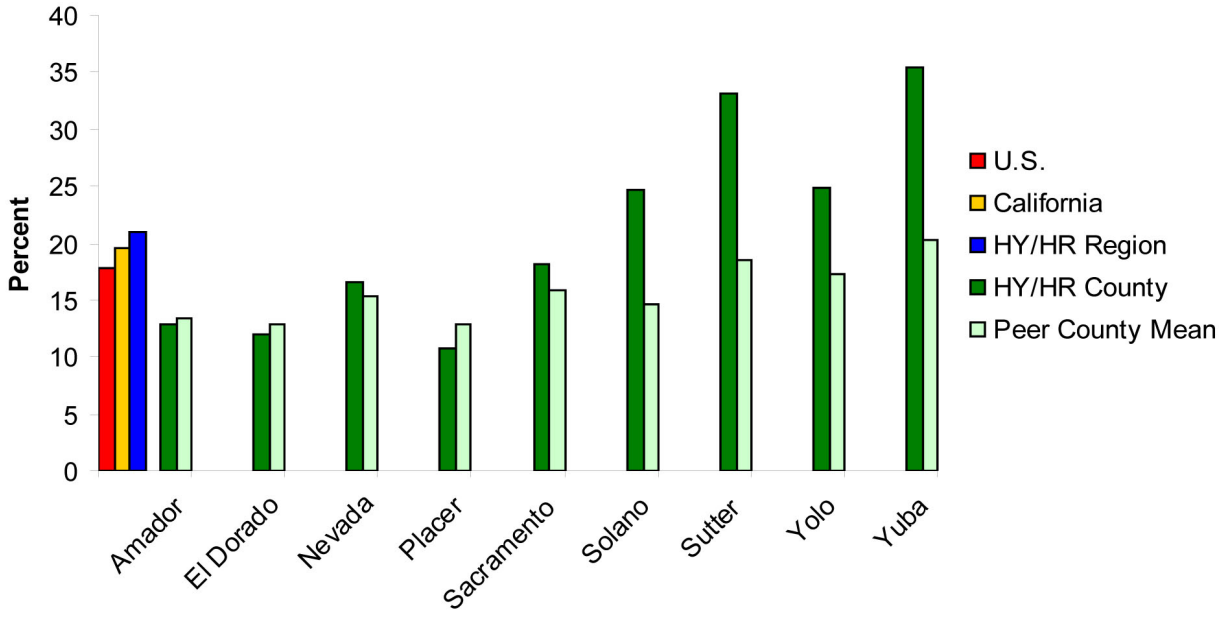


Figure 32: No prenatal care in the first trimester (all ages). Data are from the National Center for Health Statistics, National vital Statistics System; 1994-2003 via CHSI (US Dept of Health and Human Services) Percentage of births to mothers who reported receiving no prenatal care during the first trimester (3 months) of pregnancy, and includes those with no prenatal care at all. Sacramento, Solano, Sutter, Yolo and Yuba counties have statistically significant disparities in obtaining care as compared to peer counties and the U.S. rates.

Older teens are much more likely to seek prenatal care in this region (Figure 33). Besides age, health insurance may be a barrier to obtaining prenatal care. Teens in the region listing Medi-Cal or another government program as their expected source of payment were less likely to obtain prenatal care in the first trimester. In contrast, those who had private insurance or an HMO plan were more likely to get early care (Table 3). Since 72% of teens in the region rely on Medi-Cal or government programs for their healthcare, this has significant implications for access to care. In addition, Latina teens have lower rates of early prenatal care compared to non-Latina teens (40% vs. 60%). It has been shown that late, infrequent or lack of prenatal care is the most consistent risk factor for adverse outcomes.

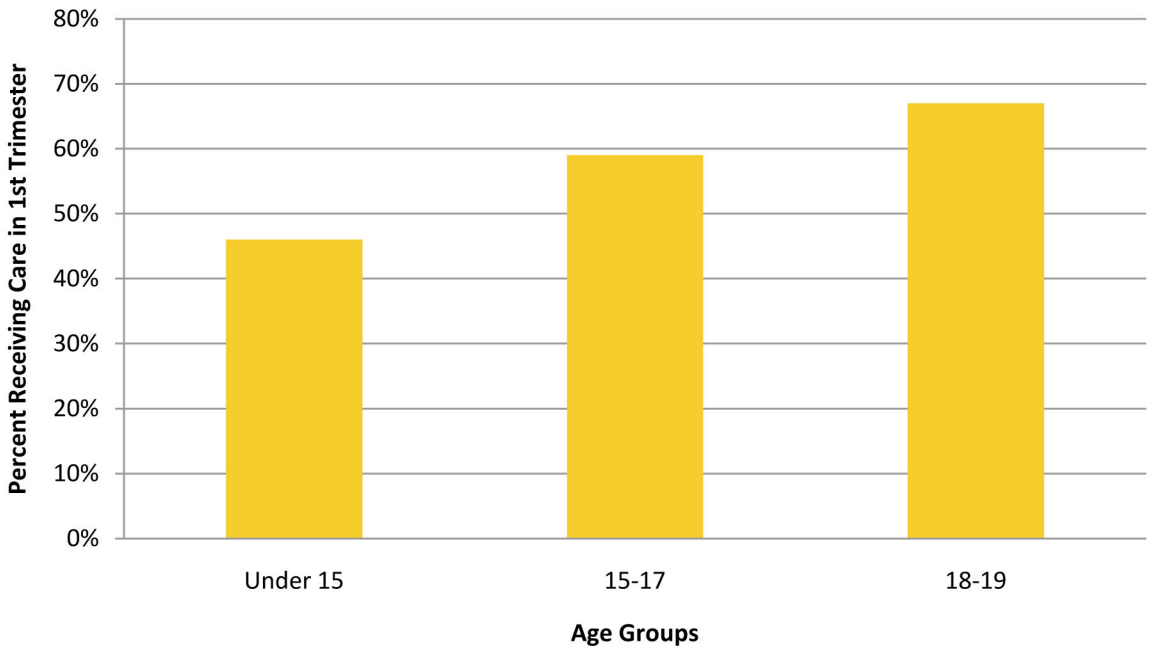


Figure 33: The percentage of HY/HR teen moms receiving prenatal care (1st trimester) by age group compared to National Healthy People 2010 goals.

Though all experts agree that prenatal care is desirable, the fact is that access to prenatal care is often an indicator of other ways a young woman is disadvantaged. For example, in one of the youth ethnographies, a young woman described the difficulty she had in obtaining prenatal care due to transportation issues. She had to leave home two hours early to navigate a route including a bus and the light rail, costing $6.00 to get her to her appointment. The trip by car would have taken approximately 10 minutes. This issue is likely to be even more devastating in rural communities. Younger teens and their families may not be aware that early prenatal care is important to their baby's health. And uninsured women may not be informed that they can enroll in presumptive eligibility Medi-Cal at the time of their first prenatal appointment at no cost. Language barriers may also play a part in the disparities observed between Latina and non-Latina women.

Table 3. Prenatal Care by Expected Source of Payment

	No. Receiving Prenatal Care in the 1st Trimester (Pct)	
Insurance Type	No	Yes
Medi-Cal	3,662 (38)	6,016 (62)
Other Gov't Programs	69 (39)	110 (61)
Private Insurance	842 (31)	1,906 (69)
HMO	197 (26)	567 (74)
Other	84 (25)	247 (75)

Another issue affecting the health of the mother and unborn child, specific to teen moms, is the non-medical use of prescription drugs. In Figure 34, taken directly from the Substance Abuse and Mental Health Services Administration's website, pregnant women aged 15 to 17 were more likely to take prescription-type psychotherapeutics (except tranquilizers) when pregnant then when not pregnant.

Table 2.20B Nonmedical Use of Prescription-Type Psychotherapeutics in the Past Year among Females Aged 15 to 44, by Age Group and Pregnancy Status: Percentages, Annual Averages Based on 2002-2004

Age and Pregnancy Status	Any Prescription-Type Psycho-therapeutic Drug	PRESCRIPTION DRUG TYPE				
		Pain Relievers	Tranquilizers	Stimulants		Sedatives
				Any Stimulant	Metham-phetmaine	
ALL FEMALES AGED 15 TO 44[1]	9.1	6.8	3.3	2.0	0.9	0.5
Pregnant	6.0	4.4	2.0	1.3	0.8	0.3
Not Pregnant	9.3	6.9	3.3	2.0	0.9	0.5
FEMALES AGED 15 TO 17[1]	13.9	11.2	4.2	4.1	1.4	0.8
Pregnant	18.2	15.0	3.3	6.4	3.2	1.7
Not Pregnant	13.8	11.1	4.3	4.0	1.4	0.8
FEMALES AGED 18 TO 25[1]	13.3	10.4	4.8	3.4	1.4	0.5
Pregnant	9.6	7.3	3.3	2.1	1.7	0.5
Not Pregnant	13.5	10.6	4.9	3.4	1.4	0.5
FEMALES AGED 26 TO 44[1]	6.8	4.8	2.5	1.1	0.5	0.4
Pregnant	2.9	1.9	1.0	0.5	*	0.1
Not Pregnant	7.0	4.9	2.6	1.2	0.6	0.5

*Low precision; no estimate reported.
NOTE: Nonmedical use of prescription-type pain relievers, tranquilizers, stimulants, or sedatives; does not include over-the-counter drugs.
[1] Estimates include those with unknown pregnancy status.
Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 2002, 2003, and 2004.

Figure 34: Non-medical use of Prescription-type psychotherapeutic drugs in the past year by drug type, age and pregnancy status. From the SAMHSA website at: (http://oas.samhsa.gov/prescription/AppD.htm#Tab2-20A, accessed 08/10/10)

One of the adverse outcomes associated with teen birth is low birth weight babies. Babies born with a low birth weight (<2,500 grams) or a very low birth weight (<1,500 grams) are at increased risk of significant health problems. Smoking and late entry into prenatal care are risk factors for low and very low birth weight babies. The risk for having a low birth weight baby increases with decreasing maternal age (Figure 35). In California, African American women of all ages experience higher low birth weight rates than other groups and the same is true for black teens in the Capital Region(Figure 36). Similarly, and perhaps related to the late entry of Latina teens into prenatal care, there was a disparity seen among Latina teens born outside of the U.S. such that they experienced more low birthweight babies.

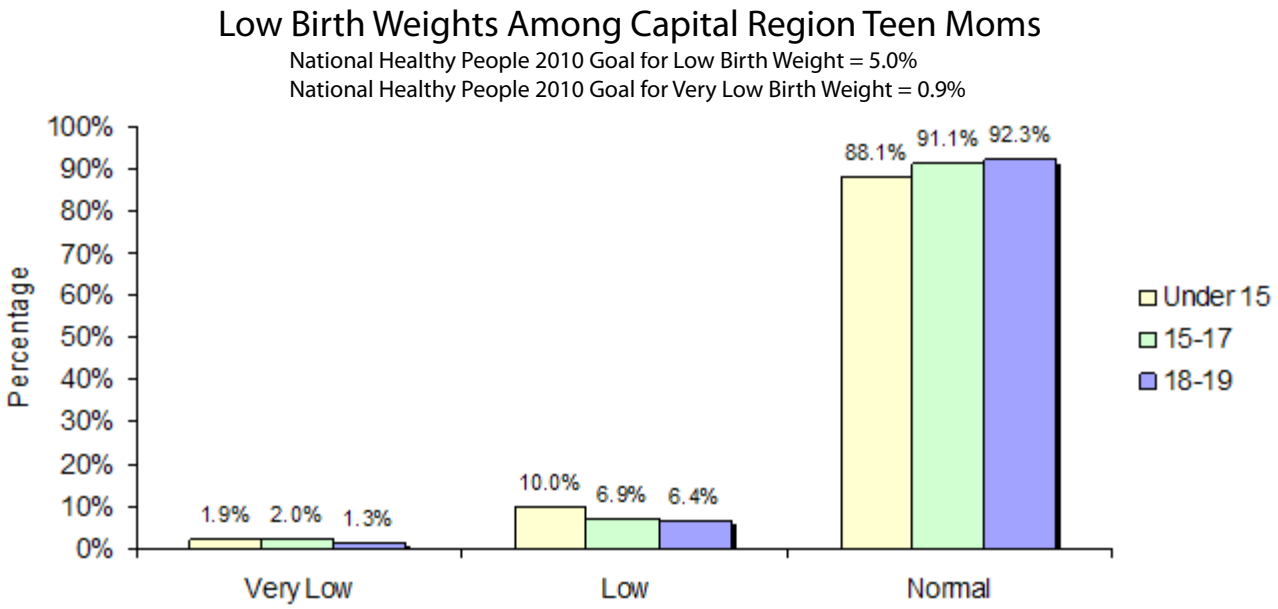


Figure 35: The risk of having a very low birthweight or low birthweight baby increases as maternal age decreases. Very low birth weight is defined as weight less than 1,500 grams and low birth weight is less than 2,500 grams. The region had not achieved Healthy People 2010 goals for this objective as of 2007.

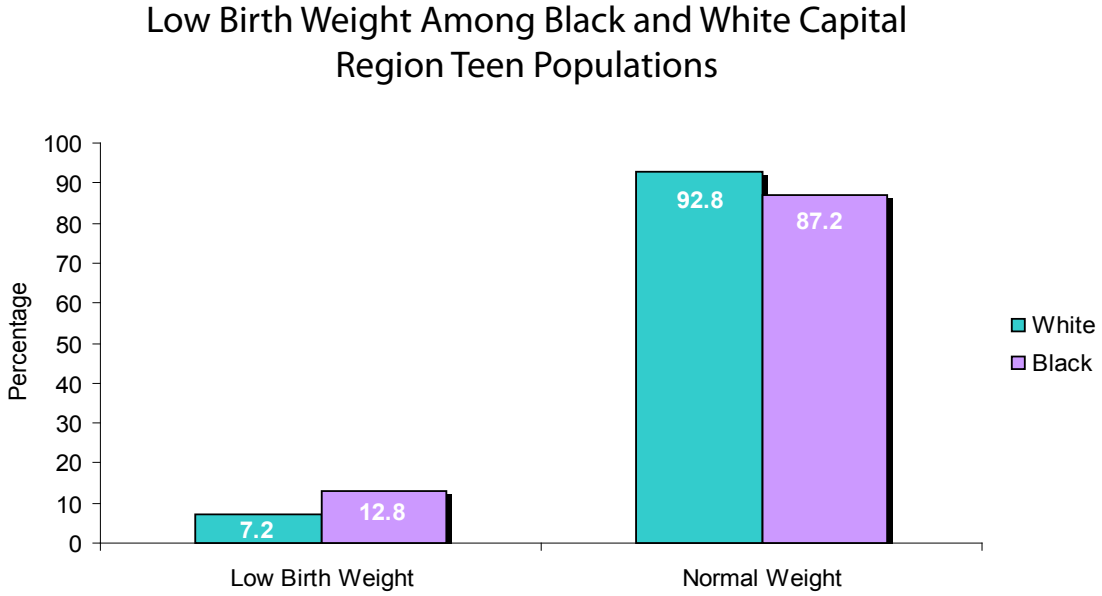


Figure 36: Percentage of low birthweight babies born to teen moms in the Capital Region who were of either white or black race. Low birthweight is defined as babies weighing less than 2,500 grams.

When teens get pregnant could have important implications for targeting the right interventions at the right time. Analysis of teens and adults in the Capital Region and the state as a whole showed similar results – women conceive more often in the winter months than at other times of the year (Figure 37). Research has shown that there is often a trough in conceptions during the hotter months of the year.

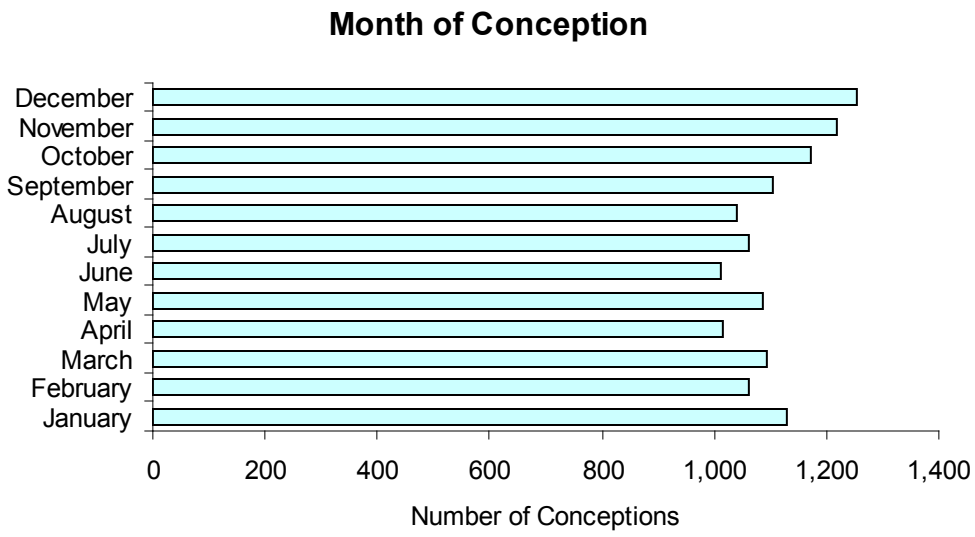


Figure 37: The month of conception for Capital Region teens based on their last menstrual period.

In the Capital Region, the mean and median age of fathers impregnating teen girls was 21.35 years with a standard deviation of 3.75 years which is consistent with state figures. There may be an unequal power relationship when the man is several years older than the teenage girl at risk. In the previously mentioned documentary about teen pregnancy, one teen advocate noted that as young women date older men there is an increase in pressure to engage in sexual activity. Along the same lines, within the youth ethnographies, one teen commented on men buying things for her and she felt like she should do something in return (indicating vulnerability to the sexual request).

Teen moms that were interviewed as a part of the Healthy Youth/Healthy Regions ethnographies project discussed several issues surrounding their lives as new mothers. Several teens commented on family support.

"Everyone are at my mom's house…it means a lot…My mom watches my son…when I need something, its usually at my mom's house, so my mom's house means a lot."

"[talking about her boyfriends mother and her boyfriend] I've learned…if somebody put you down, raise it [your head] up higher because of her. You know she's the only one who taught me like I didn't even know squat about babies, nothing, and I'm so lucky because when I got pregnant he actually stood up, his whole family stood up. He is in this hole, we're all in this hole, that's how they are and I'm very lucky that I got stuck with somebody like them."

There were also teens that felt that they derived strength from their children. This is not surprising since one aspect of having social support is being able to provide nurturing to another person. It is important to note that there are, indeed, positive consequences of teen birth as well.

"I'm so happy I have this child now it's like oh my goodness I would not know what I would do without her."

"[a teen father]My dad left me when I was little like I'll be damned, I can't imagine what I'll do without my son now. It blows my wig off he's about to be a year old. That's breathtaking by itself. I can't believe it."

"[teen father]I've been there for my son ever since the damn pregnancy and you don't see too many people my age, kids like me that are actually doing that…I just went out and spent $100 on my kid today. I've never done that before just because we didn't buy shampoo or conditioner this month, we didn't buy a new DVD like we do all this month, we bought toilet paper and spent 100 bucks on him, we bought him a Power wheels thing and we bought him a couple of outfits. So it was cool, I've never been able to do that before and it was kind of cool doing it. But the whole stereotypical you're a dropout so you're never going to amount to nothing I think that's all crap because, I don't know, I look it like a bigger picture because like there's hope for all of us, like you can make something out of nothing if you put your heart and souls and belief and dedication into anything that you want like you can do it."

But financial support is still a problem. Teens interviewed used services like WIC, welfare and food stamps. But the support had limitations. For example, they couldn't buy basics, like diapers, with the food stamps. And one teen said that they got $660/month on welfare. "Then $475 goes to rent and them bam I don't get to see that at all and then like $100 for PG&E and then I'm left with like $100 for my son and that's diapers and wipes and everything he needs for the month. We never have any spending money, it's all for him."

With limited resources, it is important to target interventions strategically. Approaches may be geared toward geographies experiencing disparities, vulnerable sociodemographic groups (by age, gender, race, ethnicity, income), or by the type of prevention.

Research has shown that the most successful programs for decreasing teen pregnancy provided access to contraceptive services. Programs that targeted adolescents who were younger and those who were not yet sexually experienced also showed improvement in the teen pregnancy rate.

Maintaining the health of the teen mother and her child are important for long term regional prosperity. A key issue is access to services for both financial and cultural reasons. In California, since 1997, the Family PACT (planning, access, care and treatment) program has been a key resource for contraceptive and related reproductive health services at no cost to Californians – adolescents and adults, males and females – with incomes up to 200% of the federal poverty level. The program has four features that are particularly useful to adolescents: 1) teens can enroll in the program based on their own income – not their family's income, and can access a range of services confidentially, 2) individuals can enroll on-site and receive services on the same day, 3) the delivery system includes private physicians in addition to family planning centers – allowing teens the option of seeing a private physician as a means of increasing access to services since the distance between clinics can be considerable, and 4) services are provided to all low income teens, regardless of their immigration status.

California has had great success in decreasing teen pregnancy rates, but that progress could be as fragile as it has been remarkable. According to a recent paper by Heather Boonstra (2010), "the current economic recession and historic state budget deficit have put teen pregnancy prevention programs in jeopardy and present significant challenges for the future of this work." Gary Yates, president and CEO of The California Wellness Foundation, suggests that the greater danger may be that teen pregnancy prevention will become less of a priority as the numbers improve. "Positive changes are evident in the teen pregnancy arena. Our collective actions are having an effect, but if we want to continue to see progress, we must continue to make sure our young people have the information and health services they need to prevent unwanted pregnancies and to become sexually healthy adults."

Summary of teen birth:

- The economic burden of teen birth in the Capital Region is approximately $70 million/year.
- Yuba County has the highest teen birth rate in the region and Placer County has the lowest.
- There is racial and ethnic disparity in the teen birth rate such that Black, Asian and Latina women are disproportionately affected.
- Early prenatal care is lacking in Yuba, Sutter, Solano and Yolo counties and rates of obtaining early prenatal care are lowest for younger women, Latina women and those on public insurance. Transportation may be another obstacle to obtaining prenatal care.
- Pregnant teens are more likely than other pregnant women and non-pregnant teens to use prescription-type psychotherapeutic drugs for non-medical uses.
- Pregnant teens in the region are not meeting Healthy People 2010 goals for decreasing the incidence of low and very low birth weight babies. This risk of having a low birth weight baby increases as maternal age decreases. This risk is also greater for Black women and foreign born Latina women.
- Dating older men may put a teen girl at risk for earlier sexual experience.
- Having a baby to care for may improve a young woman's social support through the nurturing experience.
- Despite California's improvement in reducing teen pregnancy, programs are at risk during the current economic recession.

Mental Health

Good mental health is essential to overall well being. Estimates of past year prevalence of major depressive episodes among persons 18 years or older were nearly 7% in California (NSDUH 2007). The 12-month prevalence rates among youth aged 12 to 17 were even more pronounced (nearly 9%). That's a burden of depression affecting more than 2.5 million individuals in the state. And that does not include other major mental illnesses like anxiety and/or substance abuse.

Research has shown that significant disparities exist in the provision of mental health care services, particularly by racial and ethnic group. The disparities arise from multiple factors and include: limited English proficiency, geographic settings, fragmented services, cost and other social determinants of health (Primm et al., 2010). In order to improve opportunities for equitable mental health care services, tracking of current services and ongoing surveillance is imperative. Research is currently underway (by this researcher) in California to begin this kind of statewide surveillance.

Measuring the number of days when a person states their mental health is not good is a health-related quality of life indicator (Figure 38 - same as Figure 6). Although the figure represents adult mental health, some of those adults are likely to be parents. Children whose parents have mental health issues are at increased risk for:

- maltreatment
- developing mental health problems as they get older
- social and behavioral problems in childhood and adolescence
- stress associated consequences due to caring for a mentally ill parent (Centre for Parenting Research 2008)

The Substance Abuse and Mental Health Services Administration (SAMHSA) is an agency in the Department of Health and Human Services and is dedicated to improving the quality and availability of substance abuse prevention, addiction treatment, and mental health services in the United States. Data from this agency are available online and are reported by State Treatment

Planning Areas (Figure 39). Eight of the nine Healthy Youth/Healthy Region counties are located in SAMHSA's Region 2 and Amador County is in Region 3. Using this regional paradigm, Figures 40 - 47 show rates of substance use and mental distress within the 15 California regions.

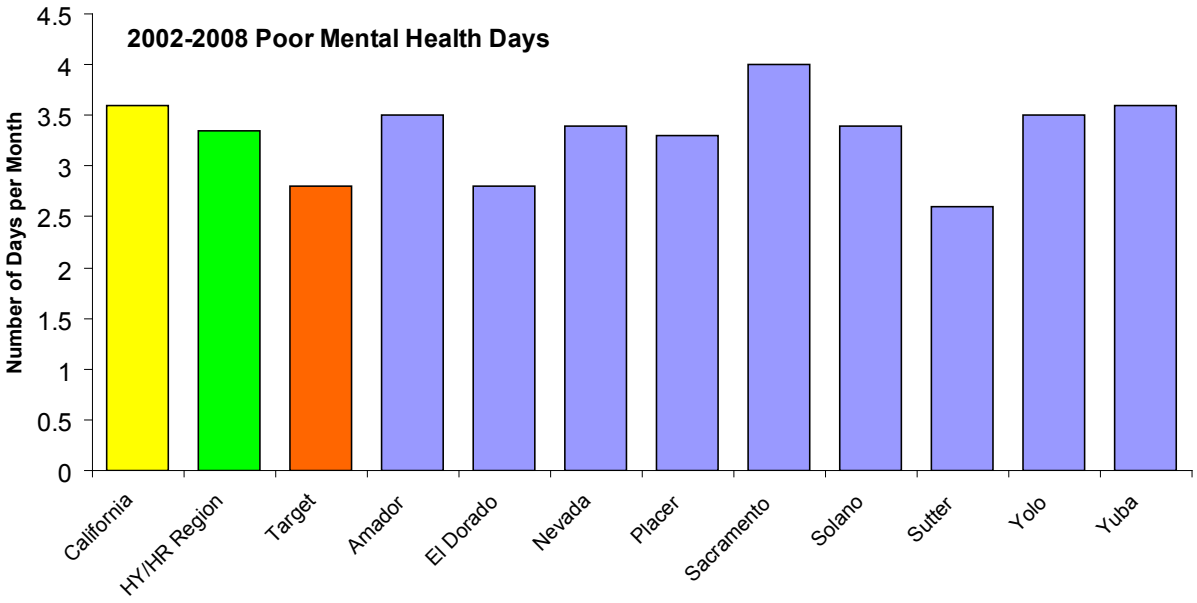
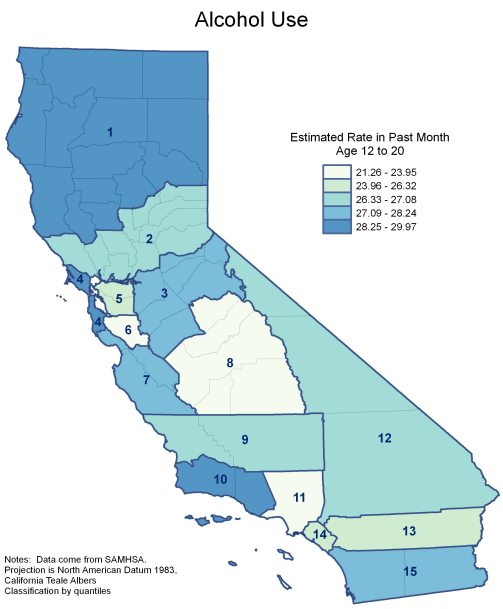


Figure 38: Adult respondents were asked how many days their mental health was not good during the past 30 days, including stress, depression and problems with emotions. Data come from the Behavioral Risk Factor Surveillance Survey via RWJ CHR (Robert Wood Johnson Foundation, 2010)

Figure 39: SAMHSA's fifteen California state treatment planning areas. Region 2 contains eight of the nine Healthy Youth/Healthy Regions counties including: El Dorado, Nevada, Placer, Sacramento, Solano, Sutter, Yolo and Yuba. Amador County is in Region 3.



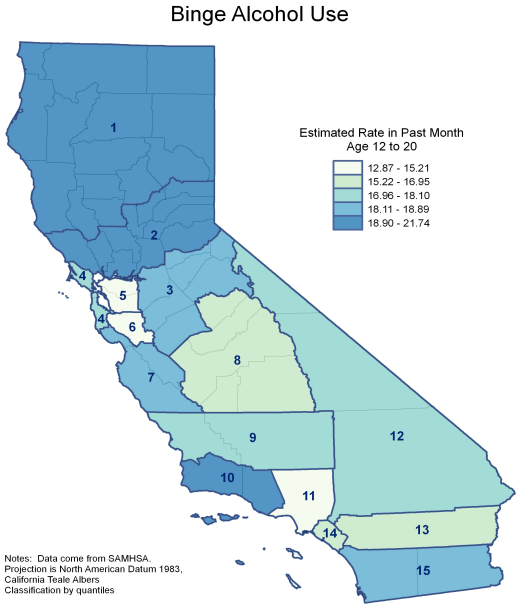
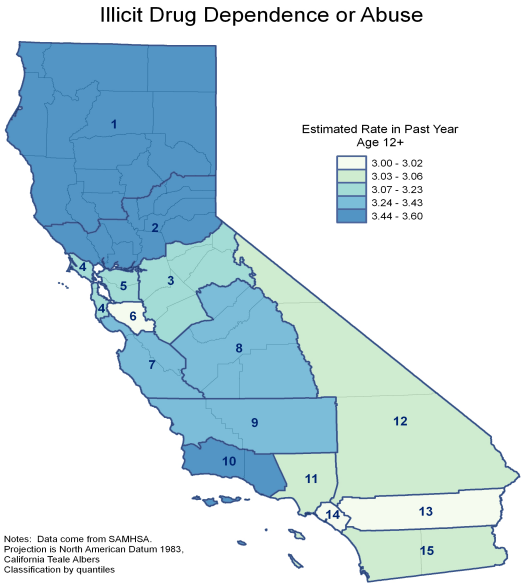


Figure 40 & Figure 41: Quintiles of Alcohol Use and Binge Alcohol Use among underage youth (12-20 years).



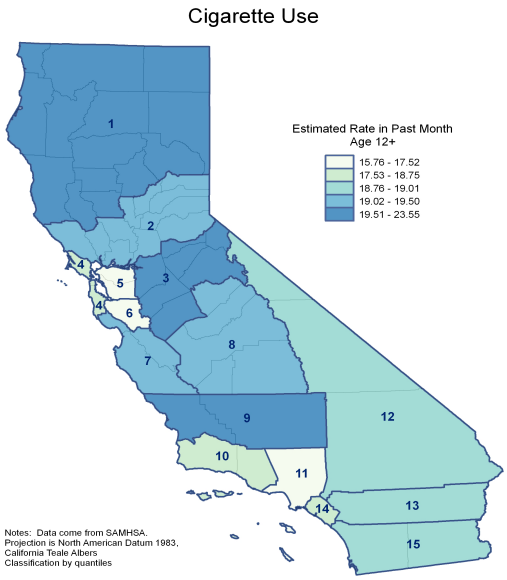
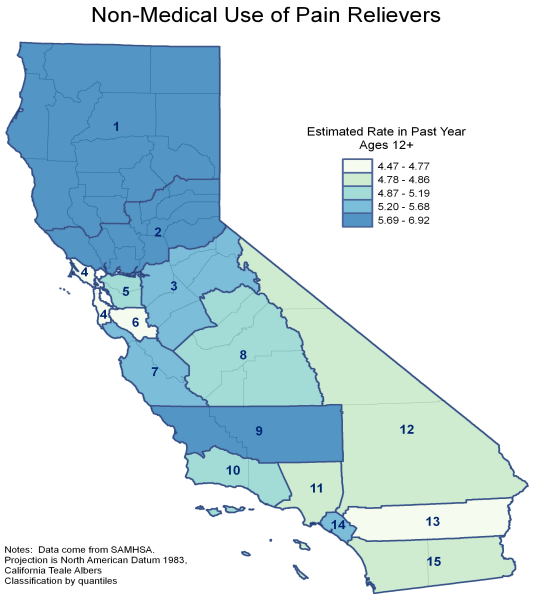


Figure 42 & Figure 43: Quintiles of Illicit Drug Dependence or Abuse and Cigarette Use among all individuals age 12 and over.



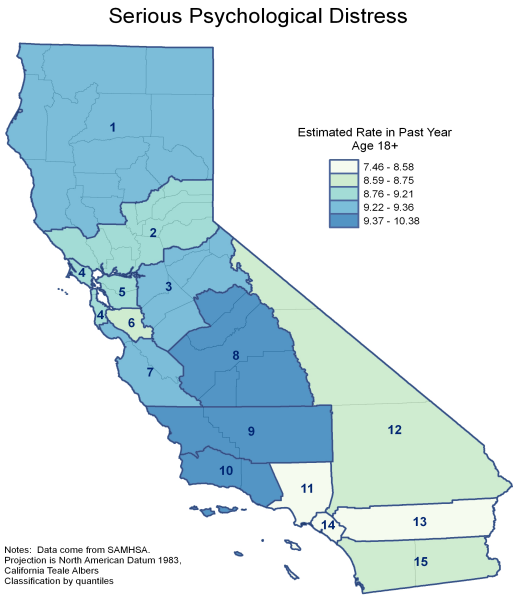
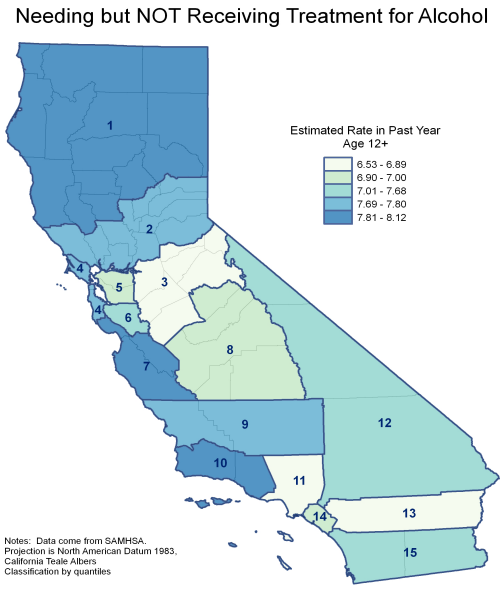


Figure 44 & Figure 45: Quintiles of Non-Medical Use of Pain Relievers for individuals age 12 and over and Serious Psychological Distress, age 18 plus.



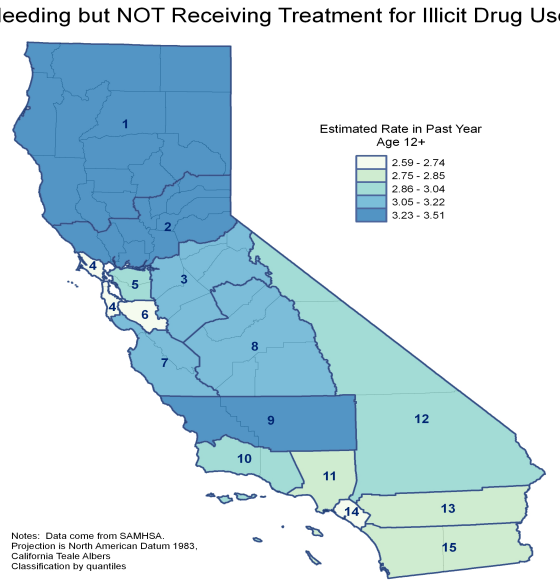


Figure 46 & Figure 47: Quintiles of Individuals Needing but NOT receiving treatment for either alcohol or illicit drug use, age 12 and over.

As can be seen from Figures 46 and 47, individuals in Region 2 are not getting the treatment they need. There is no single data source indicating the mental health treatment options available in California or even in the Capital Region. Part of the difficulty is that some people may receive their mental health care from their primary care provider. But recently the Sacramento Business Journal produced their annual healthcare supplement and printed the names and locations of all of the mental health and chemical dependency treatment centers that responded to their inquiry in Yolo, Sacramento, Placer and El Dorado Counties. Those data were geocoded and are presented in Figure 48 to help discern where in these counties needs may not be met (Figure 48).

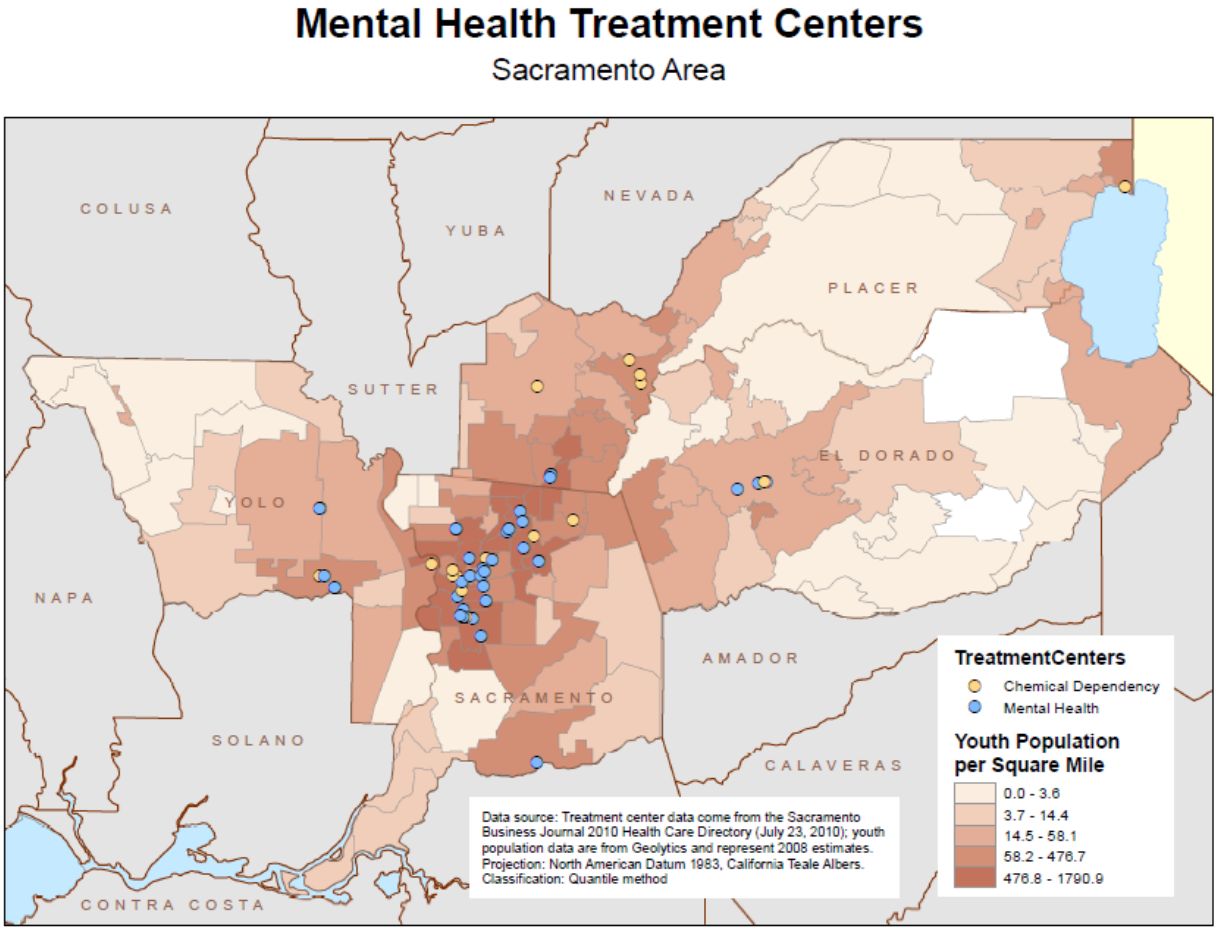


Figure 48: This map shows the underlying youth population density by zip code for ages 10-19 expressed as quintiles of density. The darker brown colors indicate higher youth densities. Overlaid on the map are the locations of mental health and chemical dependency treatment centers in Yolo, Sacramento, Placer and El Dorado counties. Data come from the Sacramento Business Journal, July 23, 2010.

<u>Summary of mental health:</u>

Good mental health is essential to an individual's overall well-being and quality of life. Data measuring mental health services in populations are under-developed, making specific observations and recommendations difficult. From the data available, the following observations can be made:

- Only El Dorado and Sutter counties meet target levels for fewer poor mental health days.

- Region 2 within the SAMHSA treatment planning centers is in the highest quintile in the state (top 20%) for binge alcohol use, illicit drug dependence or abuse, non-prescription pain medication use and an unmet need for illicit drug treatment.
- Region 2 is in the second highest quintile in the state (top 40%) for cigarette use and an unmet need for alcohol treatment.
- When looking at the number of mental health and chemical dependency treatment centers relative to youth population density, El Dorado County appears to have the fewest centers. Physical accessibility may be an issue for youth of Placer County as well since distances to treatment centers may be long.

In the United States, life expectancy averages 77.9 years (Centers for Disease Control and Prevention, 2010). That estimate varies significantly based on both modifiable and immutable factors. In the modifiable category, we know that attaining an education beyond high school provides, on average, a seven year increase in life expectancy as compared to those whose education stops with high school (Meera et al., 2008; Guralnik et al., 1993). Practicing healthy behaviors can also prevent major causes of disease such as heart disease, cancer and stroke. Some risk factors for premature death, are more difficult for individuals to change, such as crime, environmental hazards, concentrated poverty, and unemployment, but may be affected by larger policy level interventions. Immutable risks include race/ethnicity, gender and genetic predisposition to disease. The focus of this section is to examine the issue of premature death in youth in the Capital Region. With an understanding of the risk factors associated with youth death in the region, targeted strategies may be employed to prevent premature death and thereby improve regional health and well being.

All cause mortality for all age groups in the Capital Region is similar to the state rate and is less than the national rate. However, within the region, there is disparity among the 9 counties that make up the Healthy Youth/Healthy Regions study area. In particular, Yuba County has a significantly higher death rate than any other county in the region and also a higher death rate than other U.S. counties similar to Yuba (designated as peer counties based on multiple criteria previously stated) (Figure 49).

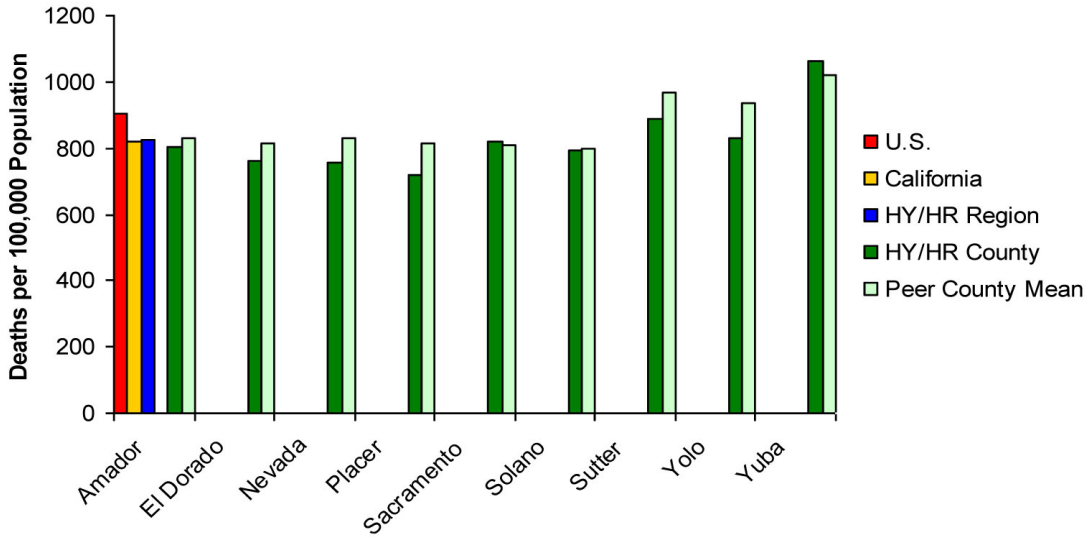


Figure 49: All Cause Death. Includes death from any cause from the National Vital Statistics System, National Center for Health Statistics via CHSI. Compares each HY/HR county in dark green to it's designated peer counties across the country in light green. Mortality rates are also shown for the region as a whole, the state of California, and the nation.

To address the youth death analysis, data were collected from the California Department of Public Health, Center for Health Statistics for the years 2004 through 2007. To ensure adequate numbers for regional analysis, the four years of data were combined.

To get an overall sense of 'excess youth death' in the region, standardized youth mortality rates (to the U.S. population) were calculated and mapped by zip code (Figure 50). This standardization is meant to facilitate comparisons of these figures to any other standardized rate. The determination of excess death was made when the standardized mortality rate in a zip code exceeded the crude death rate for the region (crude death rate was calculated as all deaths divided by youth population and multiplied by 1,000 but not weighted by the U.S. population).

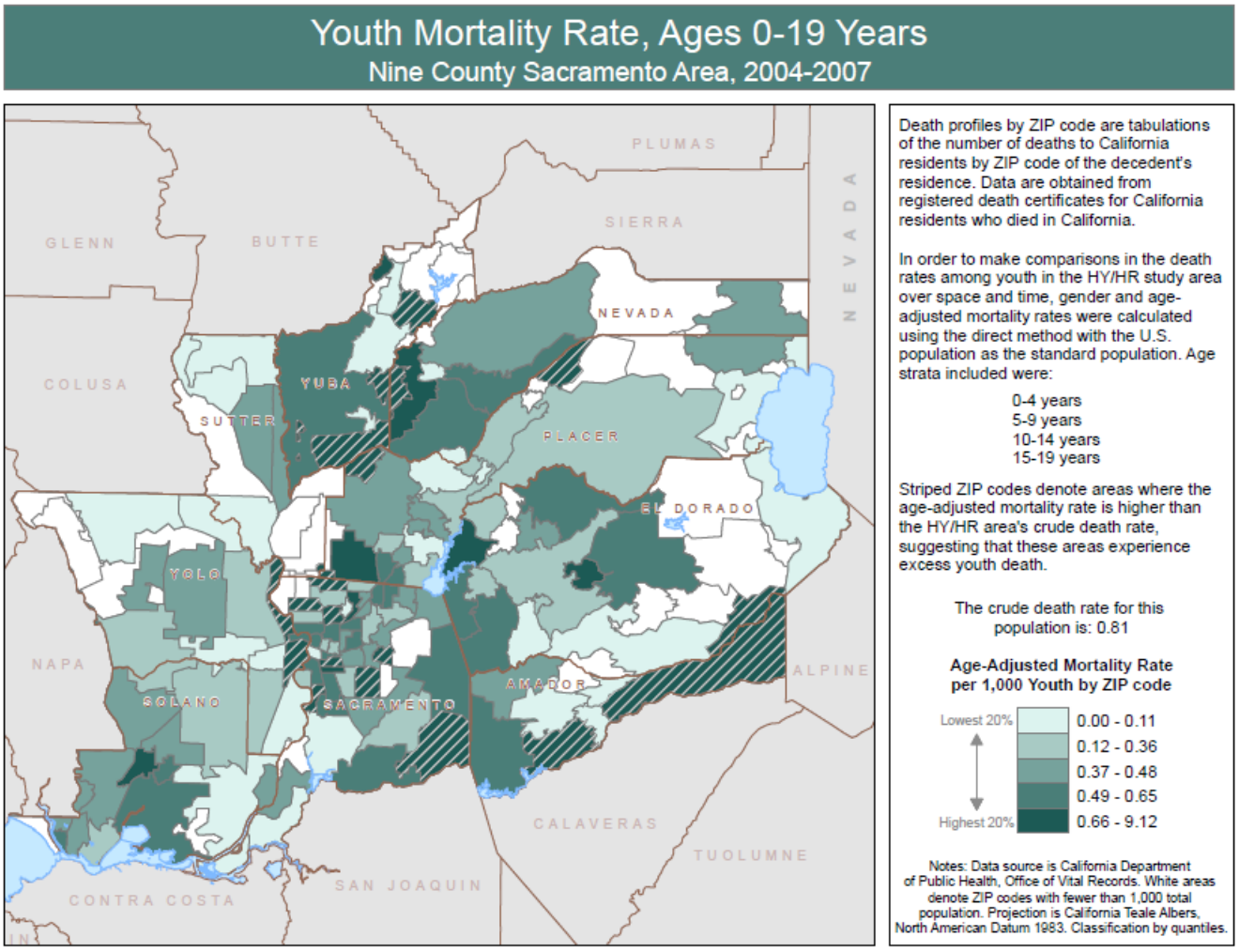


Figure 50: Figure shows overall youth mortality rate, age and gender adjusted to the U.S. population. The data are shown by quintiles of mortality rates with the darkest color representing the highest quintile. Hatched areas show zip codes where the standardized mortality rate exceeded the crude death rate.

Compared to youth in California living outside of the Capital Region, youth in our region experience less premature mortality (Figure 51). However, despite the small mortality benefit, Black youth suffer a disproportionately higher mortality rate within the youth population (18.43% of all youth deaths are to Black youth who make up only 9.39% of the youth population). The Latino population experiences less death than would be expected for their population size (26.3% of deaths though making up 36% of the youth population). White, Asian and Native American populations also experience less death than expected by their population numbers.

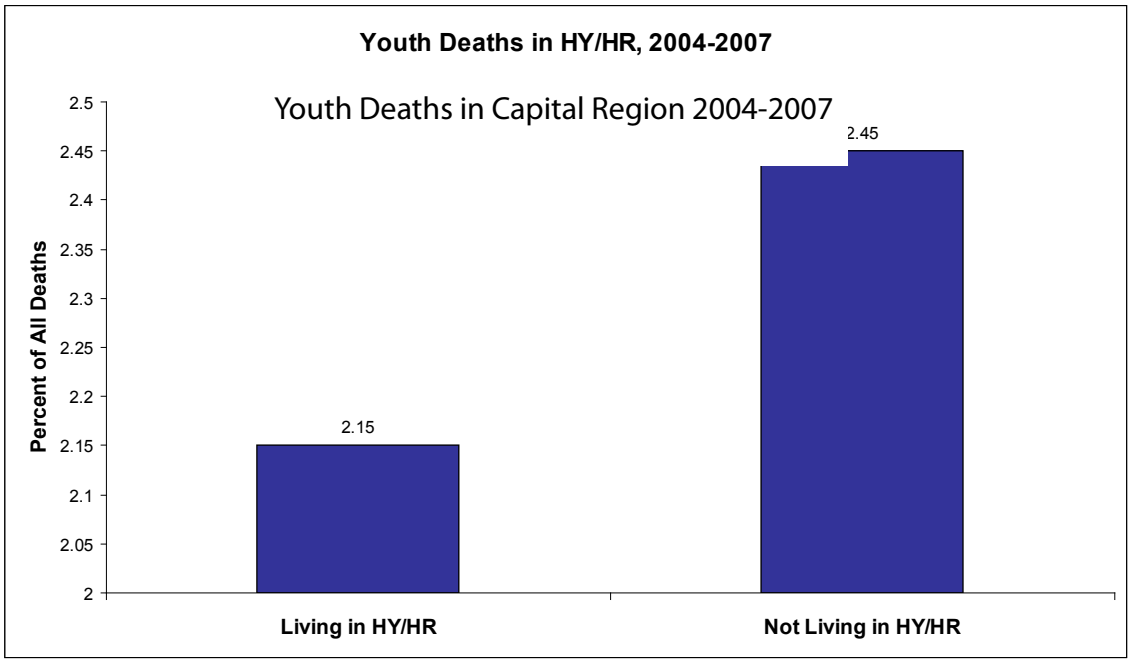


Figure 51: There are fewer youth deaths in the Capital Region than outside of the region as a function of the percentage of all deaths. The finding was statistically significant ($p < 0.001$), but the association was weak (Cramer's $V = 0.0052$).

Birth complications are a major cause of death in the youngest age groups while accidental injuries predominate as children get older (Figure 52). Among the many types of accidental injury, motor vehicle accidents dominate, particularly in older youth. Other important accidental injuries in the region include homicides, drownings, motorcycle accidents, and poisonings (Figure 53). The region also has a slightly higher suicide rate than the rest of the state (4% compared to the state's 3% average)

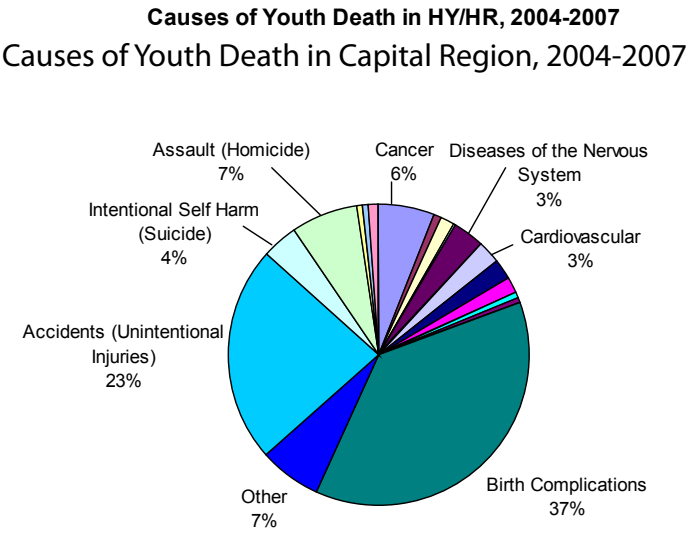


Figure 52: Causes of youth death in the Capital Region, 2004-2007.

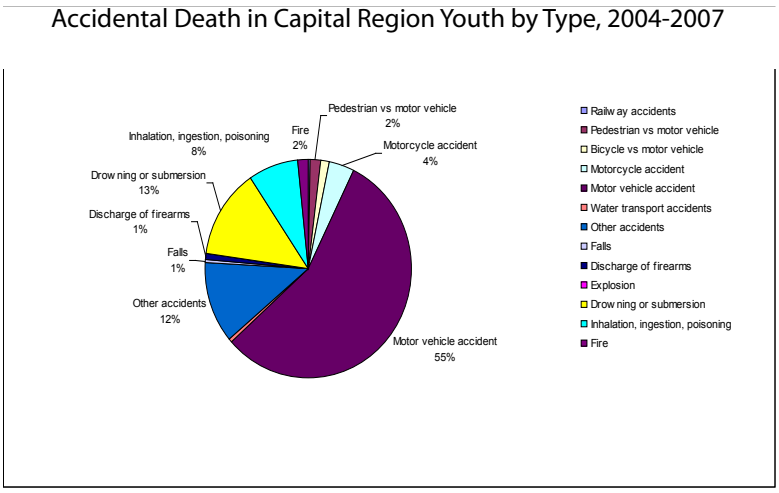


Figure 53: Accidental deaths by cause of death in Capital Region youth, 2004-2007.

Temporally, it appears that young people die more often in the summer months, directly contrasting with adult deaths which occur more frequently in the winter months (Figure 54). This may have implications for safety when youth are not in school and some may be more apt to engage in risky behaviors. Potential interventions include summer programs to keep youth occupied during the summer in a safe environment when they are out of school, or potentially year-round school.

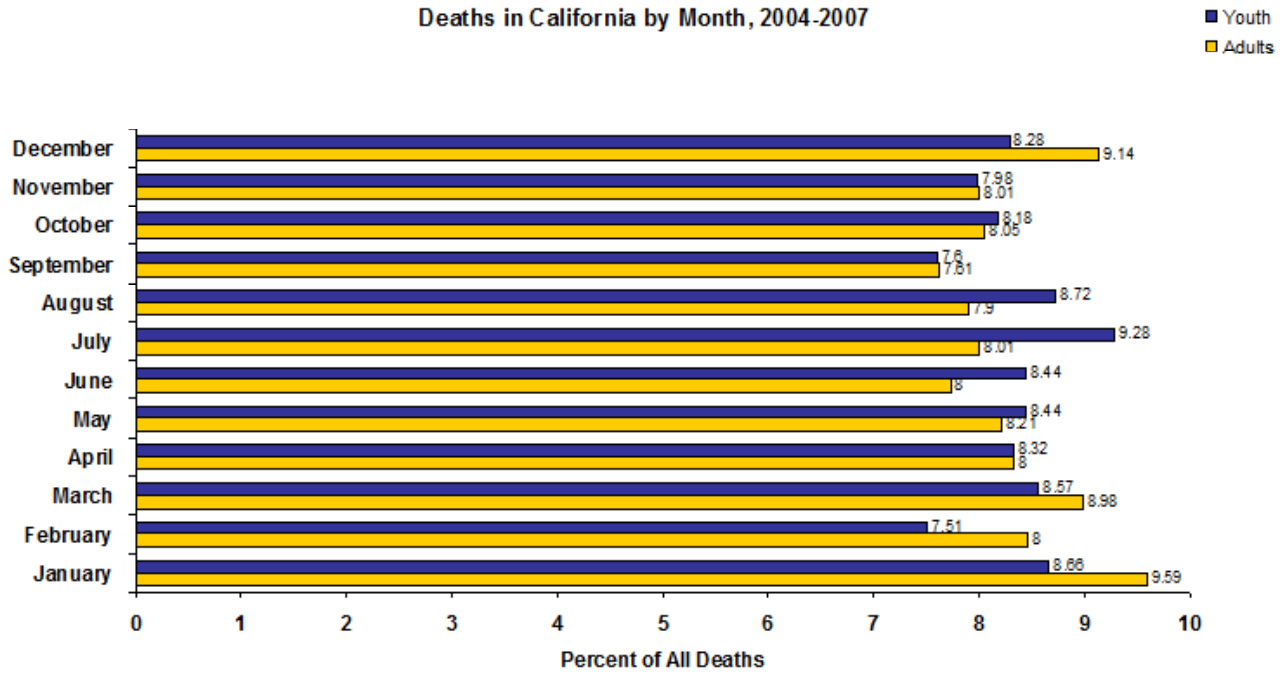


Figure 54: Youth death compared to adult death by month of the year. Youth have a significantly higher percentage of deaths in the summer months compared to adults who tend to die more frequently during the winter months.

Youth are more likely to die from accidental or violent causes that are potentially preventable events (eg. motor vehicle accidents, suicide, homicide, drowning). Efforts at preventing of violent deaths, both by homicide and suicide, should focus on precipitating circumstances like relationship problems, interpersonal conflicts and recent crises (Table 4). The most effective interventions address issues such as social isolation, lack of connectedness among persons, families and communities and early development of social skills. Both family and school environments are appropriate venues for developing these competencies. In addition, mental health problems must be addressed, particularly depression, which is highly prevalent among suicide decedents. One of the greatest barriers to

mental health treatment is the stigma associated with being mentally ill. Furthermore, particularly for youth, access to services can be an issue as has previously been noted. Primary prevention must be aimed at changing cultural attitudes and norms surrounding mental illness so that those in need can seek treatment without hesitation (Karch et al., 2010).

Table 4: Circumstances Preceding Fatal Violent Injury (from the National Violent Death Reporting System, 2007)	
Suicide	Homicide
Current depressed mood	Precipitated by another crime
Current mental health problem	Argument over money or property
Alcohol/other substance problem	Other argument, abuse, conflict
History of suicide attempts	Jealousy ('lover's triangle')
Crisis during previous 2 weeks	Intimate partner violence - related
Physical health problem	Drug involvement (dealing, illegal use)
Intimate partner problem	Gang-related
School problem (e.g. poor grades, bullying, social exclusion, performance pressures)	Decedent was an intervener assisting a crime victim
Friend of family suicide in previous 5 years	Brawl (mutual physical fight involving 3 or more persons)
Recent legal problem	Hate crime

In the Capital Region homicide victims were most likely to be in the youngest age group (0-4 years) and the oldest age group (15-19 years). Surprisingly, most homicides occurred at home (Figure 55). Furthermore, homicide events were most prevalent in the summer months of July and August and in the winter months of December and January.

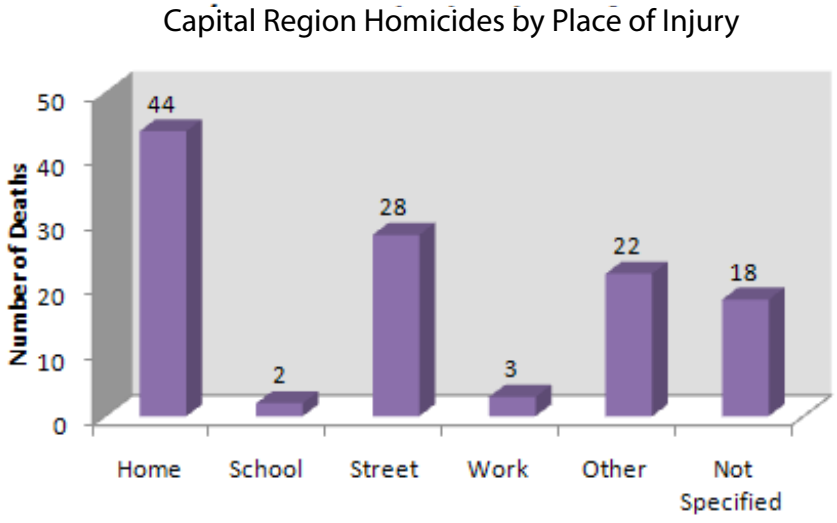


Figure 55: Capital Region Homicides by place of injury, 2004-2007.

As noted above, among the major causes of youth death, accidental injury is second only to complications at birth. Motor vehicle accidents are, by far, the most prevalent cause of accidental

deaths in youth nationwide. In our region, most motor vehicle deaths occurred in June and July as well as October. When examining the days of the week when motor vehicle fatalities were most likely to occur, Friday, Saturday and Monday were much higher than Tuesday, Wednesday and Thursday. The association with Mondays was further reviewed to see if there was a link to holiday weekends, but no clear evidence was found. Of the 42 motor vehicle deaths occurring on Mondays from 2004 to 2007, six were on holiday weekends (four were on Labor Day). The high prevalence of motor vehicle death in older teens is thought to be attributable to a combination of inexperience as well as overconfidence, peer pressure, and showing off. Most serious accidents occur at night when the car has multiple occupants. Prevention should be aimed at cessation of drug and alcohol use since they are important causes of accidents due to altered sensorium. Other strategies might include increasing driver training/safety courses, seat belt usage, and road improvements and/or lower speed limits in trouble areas.

The numbers and types of injury, like overall causes of death, vary significantly by gender and age group, information which can further aid in targeting prevention strategies. The figures below reveal those differences (Figures 56 and 57).

Accidental Cause of Death by Male Gender and Age in Capital Region, 2004-2007

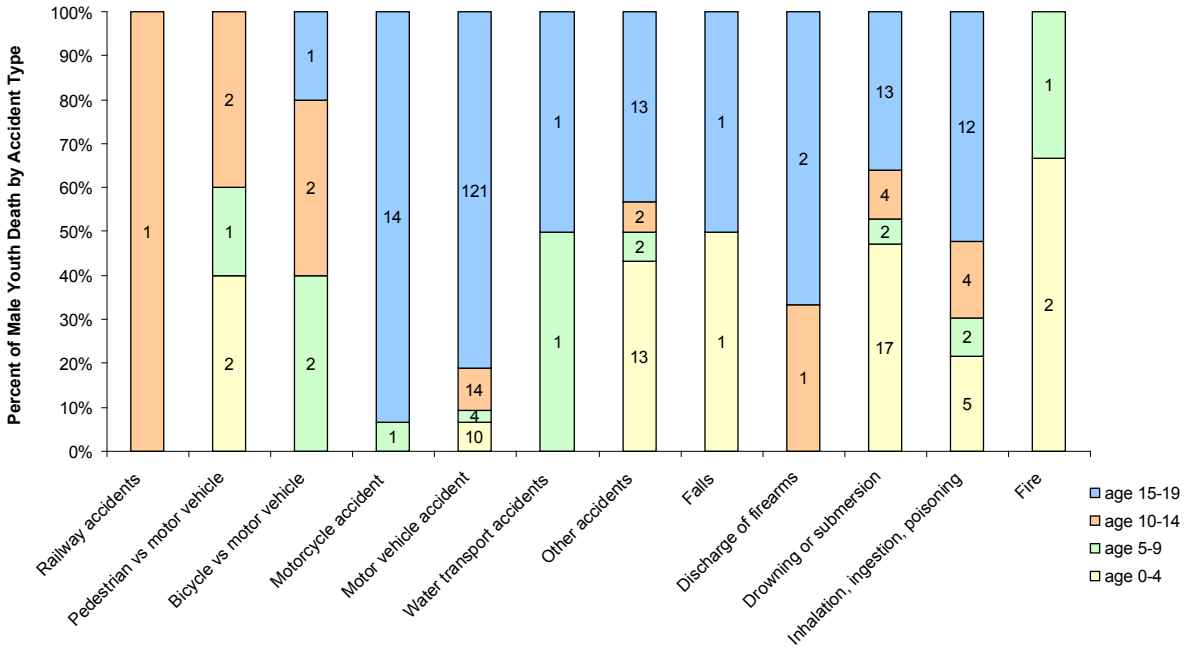


Figure 56: Types of accidental death in boys by age group. Numbers in the bars are actual numbers of deaths.

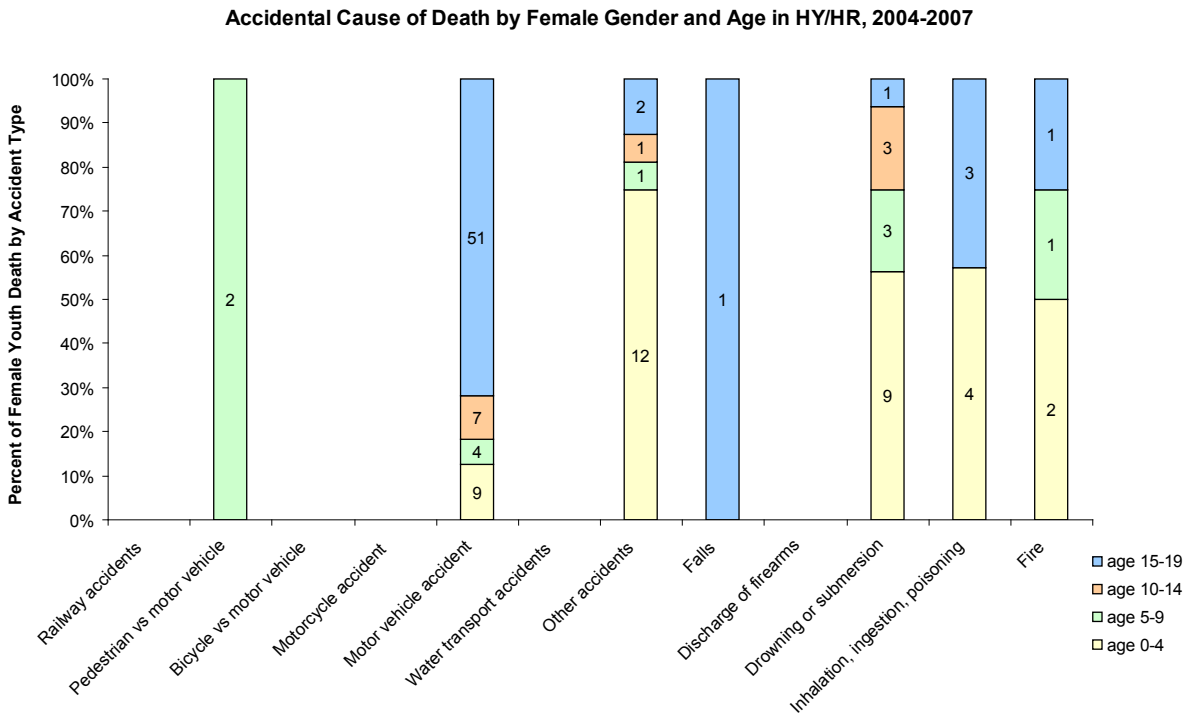


Figure 57: Types of accidental death in girls by age group. Numbers in the bars represent actual numbers of deaths.

Qualitative data increases understanding of the issues facing adolescents today and provides insight on coping mechanisms and help-seeking strategies, suggesting new policy approaches for addressing excess death.

From the PAR team in this research (Owens et al., 2010) youth discussed concern about safety related to their primary transportation modes (walking, biking and skateboarding). Their transportation routes were often heavily used traffic routes, with large trucks and fast cars. The limited bike lanes were subject to noise and fumes. Youth felt that the experience was intimidating, potentially dangerous and unpleasant. With 12 deaths from pedestrian and bicycle accidents involving a motor vehicle between 2004 and 2007, improvements in youth transportation corridors could definitely save lives.

In the youth ethnographies, 16 young adults were interviewed who left high school, and either did not complete a high school degree, or only completed it through a non-traditional alternative program.

Youth talked about violence in their neighborhoods which included gangs (with members as young as 10 and 11 years old), shootings, stabbings and other assault as well as robberies. Their stated experience was that police/law enforcement/911 responded late (if at all) and were ineffectual. One person suggested that law enforcement readjust patrols to focus more on neighborhood crimes and less on highway patrol.

Many of the youth interviewees grew up in violent households in which their parents often fought with threats/gestures of deadly force. One respondent even witnessed their mother's attempted suicide. These youth often learned about drugs and alcohol from a parent who was either a user or tolerated/encouraged the child's use of drugs.

The primary issue noted in school was fighting, whether among gang members or just in general.

Of the 16 interviewees, at least four mentioned being close to someone who died prematurely, two violently, one by drowning and one by cancer. It is worth noting that throughout the youth ethnographies, though the content often dealt with difficult themes, the young people showed tremendous resilience and optimism for the future (Burciaga & Erbstein, 2010).

Summary of excess death:
Youth death is a tragedy and in many cases is related to highly preventable causes. The most important risks for youth death in our region include:

- Motor vehicle accidents
- Drowning
- Weekends
- Summer
- Boys age 15-19 years
- Home environment

Interventions should be targeted toward building safe home environments, teaching interpersonal relationship skills, and decreasing risky behaviors – especially drug and alcohol use. Providing centers where teens can spend time on weekends and during the summer may also be beneficial.

Conclusion

Youth Health is multi-factorial and can only be understood by looking at how a variety of factors culminate in a young person's overall physical and mental health experience. Sometimes health is a driver of youth success, when physical or mental health problems dominate an individual's experience, such as with teen pregnancy and accidental injury and death. In most cases, though, physical and mental health may be considered an outcome - a way to measure how all processes are working together to predict individual well-being.

It has been said that improving youth health outcomes may be better served by taking a youth development approach. Using this philosophy, instead of focusing on the prevention of illness alone, one should take an ecological perspective that emphasizes "young people's potential (not as problems) and the reciprocal interactions (positive or negative) that they have with their environment. [This approach] nurtures a young person's internal assets, including their emerging capacities for empathy and engagement, meaningful relationships, critical thinking, and leadership, with a 'downstream' effect of improving health-related behaviors" (Kreip, 2006). In this way, health becomes less about the absence of disease and more about attainment of a full human potential. To accomplish this goal, young people must be involved in the planning and decision making about their environment as has been elucidated in the other papers in this research. And then we can achieve healthy youth in a healthy region.

References

Ahn, M.K., Juon, H.S. & Gittelsohn, J. (2008). Association of Race/Ethnicity, Socioeconomic Status, Acculturation, and Environmental Factors with Risk of Overweight Among Adolescents in California, 2003. *Prev Chronic Dis.* 5(3).

Babey, S.H., et al. (2008). Physical Activity Among Adolescents: When Do Parks Matter? *American Journal of Preventive Medicine*, 34(4): p. 345-348.

Barnett, A., et al. (2005). Air pollution and child respiratory health: a case-crossover study in Australia and New Zealand. *Am J. Respir Crit Care Med*, 171(11): p. 1272-1278.

Benner, C., Mazinga, G. &Huang, G. (2010). *Race, Space and Youth Labor Market Opportunities in the Capital Region*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Bernstein, J., Chollet, D. & Peterson, S. (2010). How Does Insurance Coverage Improve Health Outcomes?, in Reforming Health Care. *Mathematica Policy Research, Inc*. p. 1-5.

Bonomi, A., et al. (2008). Association between self-reported health and physical and/or sexual abuse experienced before age 18. Child Abuse Negl., 32(7): p. 693-701.

Bonomi, A., et al.(2008). Health care utilization and costs associated with child abuse. *Journal of General Internal Medicine*, 23(3): p. 294-299.

Boonstra, H.D. (2010). Winning Campaign: California's Concerted Effort To Reduce Its Teen Pregnancy Rate. *Guttmacher Policy Review*, 13(2): p. 18-24.

Breslau, J., Rodriguez, G.M., Erbstein,N., Burciaga, R. & Hartzog, C. (2010). *Educating for Equity: An Analysis of the Capital Region Educational Pipeline*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Burciaga, R. & Erbstein, N. (2010). *Challenging Assumptions, Revealing Community Cultural Wealth: Youth Adult Wisdom on Hope and Hardship*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Centers for Disease Control and Prevention. (2007). *Children and Secondhand Smoke Exposure*. [cited August 12, 2010]; Retrieved from: http://www.cdc.gov/features/childrenandsmoke/.

Centers for Disease Control and Prevention. (2008). *Healthy Youth!*[cited August 12, 2010]; Retrieved from: http://www.cdc.gov/HealthyYouth/healthtopics/index.htm.

Centers for Disease Control and Prevention. (2010). Deaths: Final Data for 2007, *National Vital Statistics Reports*, p. 1-135.

Centre for Parenting and Research; NSW Department of Community Services (2008). *Parental mental health and its impact on children*. [cited August 12, 2010]; Retrieved from: http://www.community.nsw.gov.au/docswr/_assets/main/documents/researchnotes_parental_mentalhealth.pdf.

Chen, X.-K., et al. (2007). Teenage Pregnancy and adverse birth outcomes: a large population based retrospective cohort study. *International Journal of Epidemiology*, 36: p. 368-373.

Edelstein, B. (2006). The Dental Caries Pandemic and Disparities Problem. *BMC Oral Health*, 2006. 6(Suppl 1): p. S2.

Finn, R.(2010). Slight Uptick Seen in Teen Pregnancy Rates, in *Internal Medicine News.*

Gauderman, W.J., et al. (2004). The Effect of Air Pollution on Lung Development from 10-18 years of age. *New England Journal of Medicine*, 351: p. 1057-1067.

Geraghty, E., Cassie H., and Nancy E. (2010). *An Analysis of Youth Well-Being in the Capital Region*. Healthy Youth/Healthy Regions Working Paper. Center for Regional Change, UC Davis

Grassi-Oliviera, R., Ashy, M. & Milnitsky Stein, L. (2008). Psychobiology of childhood maltreatment: effects of allostatic load? *Rev Bras Psiquiatr*, 30(1): p. 60-68.

Guralnik, J.M., et al.(1993). Educational status and active life expectancy among older blacks and whites. *The New England Journal of Medicine*, 329(2): p. 110-117.

Hetzel, D., et al. (2004). Inequality in South Australia. Key determinants of well being. *The Evidence of South Australia Department of Health*, Vol 1.

Karch, D.L., Dahlberg,L.I. & Patel, N. (2007). Surveillance for Violent Deaths - National Violent Death Reporting System, 16 States, *MMWR*, 59(SS-4): p. 1-56.

Kreipe, R.E. (2006). Adolescent Health and Youth Development: Turning Social Policy into a Public Health Practice. *J Public Health Management Practice*,(Suppl): p. S4-S6.

London, J.K., Campbell, D. &Kuhns, M. (2010). *California's Capital Region: A Place in Progress*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Manlove, J., et al.(2008). Trends in Sexual Experience, Contraceptive Use, and Teenage Childbearing: 1992-2002. *Journal of Adolescent Health*, 44(2009): p. 413-423.

McCallum, J., Shadbolt, B. & Wang, D. (1994). Self-rated health and survival: a 7-year follow-up study of Australian elderly. *Am J Public Health*, 84(7): p. 1100-5.

Meara, E.R., Richards, S. & Cutler, D.M. (2008). The Gap Gets Bigger: Changes in Mortality and Life Expectancy, by Education, 1981-2000. *Health Affairs*, 27(2): p. 350-360.

Ministry of Health. (2008). *Youth Health*. [cited August 10, 2010]; Retrieved from: http://www.moh.govt.nz/moh.nsf/indexmh/youthhealth.

Murray, C., Kulkarni, S & Michaud,C. (2006). Eight Americas: Investigating Mortality Disparities across Races, Counties, and Race-Counties in the United States. *PLoS*, 3(9): p. e260.

Murray, N., et al. (2007). Coordinated school health programs nad academic achievement: A systematic review of the literature. *Journal of School Health,* 77(9): p. 589-600.

NSDUH Report (2007). *State Estimates of Depression: 2004 and 2005*. [cited 06/24/2010]; Retrieved from: http://www.oas.samhsa.gov/2k7/states/depression.htm.

Osterling, K., D'Andrade, A& Austin,M. (2008). Understanding and addressing racial/ethnic disproportionality in the front end of the child welfare system. *J Evid Based Soc Work*, 5(1-2): p. 9-36.

Owens, P.E., Nelson, A.A., Perry, A. & Montgomery-Block, K.F. (2010). *Youth Voice Matters: Toward Healthy Youth Environments*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Pollick, H., et al. (1999) *Report of the California oral health needs assessment of children 1993-1994: background, methodology, findings*. The Dental Health Foundation: Oakland, CA.

Primm, A.B., et al. (2010). The Role of Public Health in Addressing Racial and Ethnic Disparities in Mental Heatlh and Mental Illness. *Preventing Chronic Disease: Public Health Research, Practice, and Policy*, 7(1): p. 1-7.

Reynolds, A., Mathieson, L.& Topitzes,J. (2009). Do early childhood interventions prevent child maltreatment? A review of research. *Child Maltreat* 14(2): p. 182-206.

Rios, M., Campbell, D. &. Romero, M.S. (2010). *Imagining the Spaces of Regional Action Framing Youth Problems and Solutions*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Robert Wood Johnson Foundation. (2010). *County Health Rankings*. [cited 2010]; Retrieved from: http://www.countyhealthrankings.org/.

Romero, M.S., London, J.K., and Erbstein, N. (2010). *Opportunities and Challenges for Youth Civic Engagement*. Healthy Youth/Healthy Regions, Working Paper, Center for Regional Change, UC Davis.

Santelli, J.S. & Melnikas, A. (2010). Teen Fertility in Transition: Recent and Historic Trends in the United States. *Annu Rev Public Health*, 31.

Santelli, J.S., et al. (2009). Changing Behavioral Risk for Pregnancy Among High School Students in the United States, 1991-2007. *Journal of Adolescent Health*, 45: p. 25-32.

Shiboski, C., et al. (2003). The association of early childhood caries and race/ethnicity among California preschool children. *J Public Health Dent*, 63: p. 38-46.

Taras, H. (2005a). Nutrition and student performance at school. *Journal of School Health*, 75(6): p. 199-213.

Taras, H. (2005b). Physical activity and student performance at school. *Journal of School Health*, 75(6): p. 214-218.

The Annie E. Casey Foundation. (2010). *Kids Count*. Retrieved from: http://www.kidscount.org.

Trapp, D. (2010). Fewer uninsured children, more uninsured adults: private coverage continued to decline in early 2009 as more children enrolled in public programs, in *Amednews*. American Medical Association.

U.S. Department of Health and Human Services. (2010). *Community Health Status Indicators (CHSI)*. [cited 2010]; Retrieved from: http://communityhealth.hhs.gov/homepage.aspx?j=1.

U.S. Department of Health and Human Services.(2010). *About Healthy People*. [cited August 10, 2010]; Retrieved from: http://www.healthypeople.gov/About/.

UC Berkeley & California Dept of Social Services. (2009) *Child Welfare Dynamic Report System*. 12/31/2008 [cited June 30, 2009]; Retrieved from: http://cssr.berkeley.edu/ucb_childwelfare/.

Wilkinson, R. & Pickett,K. (2006). Income inequality and population health: a review and explanation of the evidence. *Soc Sci Med*, 62(7): p. 1768-84.

World Health Organization. (2010). *Public Health and Environment: Health through a better environment* [cited August 11, 2010]; Retrieved from: http://www.who.int/phe/en/.