FINAL: Chittenden County Public Health and Community Design Data Analysis

On January 25, 2012 the Steering Committee accepted these Analysis Reports with the understanding that that as a part of the final ECOS product they remain open for amendment until the whole product is finalized.

1/25/2012

An ECOS Analysis Report

This analysis provides a brief introduction to the role of community design in improving population health and a snapshot of the demographics, chronic health conditions and associated risk factors of the residents of Chittenden County, followed by recommendations for towns and municipalities.

ENVIRONMENT | COMMUNITY | OPPORTUNITY | SUSTAINABILITY
A SUSTAINABLE FUTURE FOR CHITTENDEN COUNTY

TABLE OF CONTENTS

INTRODUCTION 2
PUBLIC HEALTH: WHAT IS IT AND WHY DOES COMMUNITY DESIGN MATTER? 4
PREVENTION 4
THE STATE OF THE NATION: WHAT IS KILLING US? 8
CHITTENDEN COUNTY PUBLIC HEALTH DATA 10
RECOMMENDATIONS 29
SOURCES 31
APPENDIX A 34

Chittenden County Public Health and Community Design Data Analysis

PROVIDED BY THE BURLINGTON DISTRICT OFFICE OF THE VERMONT DEPARTMENT OF HEALTH

INTRODUCTION

The ECOS Project Steering Committee is a broadly-based 60+ member partnership committed to implementing strategies to improve Chittenden County's long-term sustainability: economically, environmentally and socially. The Steering Committee has committed to a five-phase project:

1. Adopt common goal statements
2. Analyze reports regarding economic development, housing, energy, land use and transportation, natural resources and health/human services/education
3. Develop indicators tied to the goal statements
4. Prioritize implementation actions for the next five, ten and twenty years
5. Invest in high priority implementation actions.

The results will inform regional, municipal and other plans as they are updated. This report is part of ECOS Phase Two.

The vision of the ECOS project is a **healthy**, inclusive and prosperous community.

The following ECOS goals are implicitly public health related and are included in the area Social Community:

- Decrease the proportion of residents engaging in unhealthy behaviors such as smoking and binge drinking.
- Improve the ability of Chittenden County residents to access safe, affordable, healthy food, especially locally produced.
- Increase the ability of residents to engage in physical activity.

The purpose of the this report is:

1. To provide a framework for considering the impact of community design on population health in the context of Chittenden County, Vermont.
2. To compile and interpret available data into a format that regional and town planners and administrators can use to determine the health impact of their planning and decision-making.
3. To assist planners with priority setting regarding the health impacts of their planning and implementation work.
4. To provide other ECOS work groups with readily available data to guide them on the health impacts of their recommendations.

Highlights of the report:

- Health starts in our families, in our schools and workplaces, in our playgrounds and parks, and in the air we breathe and the water we drink. The conditions in which we live and work have an enormous impact on our health.
- Community design can improve population health by increasing physical activity, reducing injury, increasing access to healthy food, improving air and water quality, minimizing the effects of climate change, decreasing mental health stresses, strengthening the social fabric of a community, providing fair access to livelihood, education, and resources, reducing exposure to tobacco advertising, and increasing smoke-free indoor and outdoor policies.
- Interventions that include the community and policies and systems level of the Vermont Prevention Model are critical to achieving individual level behavior changes that will improve health.
- Eliminating tobacco use, increasing physical activity levels and improving nutrition, and decreasing excessive alcohol consumption are priorities in decreasing the leading causes of death. Research shows that healthy community design is associated with improvements in these health behaviors.
- Within Chittenden County, there are several identified populations who experience health disparities (i.e., racial or ethnic minorities, low-income, homeless).
- Among adults and youth in Chittenden County:
    - Too many smoke or are exposed to second hand smoke.
    - Too many are not getting enough physical activity.
    - Too many are not eating enough fruits and vegetables.
    - Too many are engaging in underage and/or binge drinking.

- Towns and municipalities can use the report recommendations to improve the health, natural environment, economy, and social capital of their community.

PUBLIC HEALTH: WHAT IS IT AND WHY DOES COMMUNITY DESIGN MATTER?

Public health is the science and art of protecting and improving the health of communities. The way we design and build our communities affects our physical and mental health. Healthy community design integrates evidence-based health strategies into community planning, transportation, and land-use decisions.

According to the Centers for Disease Control and Prevention, healthy community design can improve people's health by:

- Increasing physical activity.
- Reducing injury.
- Increasing access to healthy food.
- Improving air and water quality.
- Minimizing the effects of climate change.
- Decreasing mental health stresses.
- Strengthening the social fabric of a community.
- Providing fair access to livelihood, education, and resources. [1]
- Reducing exposure to tobacco advertising. [2]
- Increasing smoke-free indoor and outdoor policies. [3]

Prevention

Public health is historically and inextricably linked to community planning. The leading cause of death during the industrial revolution was infectious disease. Public health laws and changes in community design improved living and working conditions and the health, safety, and welfare of the general public. While control of infectious disease continues to remain a vital part of the work of public health, prevention efforts have become strongly focused on the prevention of chronic disease. And just as community design was critical to the prevention of infectious diseases, it is critical to the prevention of chronic diseases.[4]

Prevention focuses on the proactive approach, through thoughtful planning and assessment leading to improved health and reduced cost. Preventing disease and injuries is key to improving health. When we invest in prevention, the benefits are broadly shared. Children grow up in communities, homes, and families that nurture their healthy development, and people are productive and healthy, both inside and outside the workplace. Businesses benefit because a healthier workforce reduces long-term health care costs and increases stability and productivity. Furthermore, communities that offer a healthy, productive, stable workforce can be more attractive places for families to live and for businesses to locate. [5]

In Vermont, work to improve public health and quality of life is guided by the Vermont Prevention Model (Figure 1). The prevention model illustrates that there are many factors in play that influence individual and population health.

Levels of influence

Individual: Factors that influence behavior such as knowledge, attitudes and beliefs. Strategies addressing this level of influence are designed to affect an individual's behavior.

Relationships: Influence of personal relationships and interactions. Strategies addressing this level of influence promote social support through interactions with others including family members, peers, and friends.

Organizations: Norms, standards and policies in institutions or establishments where people interact such as schools, worksites, faith based organizations, social clubs and organizations for youth and adults. Strategies addressing this level of influence are designed to affect multiple people through an organizational setting.

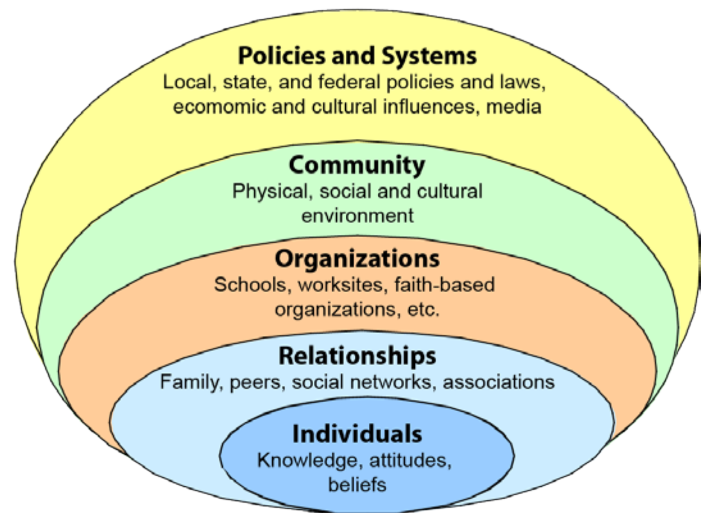


Figure 1. VT Prevention Model.

Community: The physical, social, and cultural environments where people live, work, and play. Strategies addressing this level of influence are designed to affect behavioral norms through interventions aimed at the physical environment, community groups, social service networks and the activities of community coalitions and partnerships.

Policies and Systems: Local, state and federal policies; laws; economic influences; media messages and national trends that regulate or influence behavior. Strategies at this level are designed to have wide-reaching impact through actions affecting entire populations.

Health promotion efforts are most likely to be effective if they are:

- Consistent with the needs and resources of the community.
- Developed with an understanding of the factors contributing to the problem.
- Designed to specifically address those factors.
- Inclusive of strategies addressing multiple levels of the model simultaneously.
- Sustainable over time.
- Age, gender and culturally appropriate.
- Evidence based or based on best and promising practices.

Table 1 provides examples of Prevention Strategies at all levels of the Vermont Prevention Model for some specific health issues: nutrition, physical activity and tobacco. Research has shown that an intervention that addresses all levels of the model simultaneously is more likely to be successful than an intervention that focuses only on one level. For example, it is easier for someone to quit smoking (or never begin to smoke) when they live with people who don't smoke, attend school on a smoke-free campus, are exposed to media messages that emphasize non-smoking as the social norm, and visit public places that are smoke-free.

	Nutrition	Physical Activity	Tobacco
Individual	Receiving a newsletter with nutrition information	Counseling received on the health risks of physical inactivity	Media literacy education provided to youth
Relationships	Participation in a healthy eating program with a co-worker	Walking groups	Youth tobacco prevention coalitions providing opportunities for youth activism and empowerment
Organizations	Worksites offering healthy, local foods in their cafeteria	Periodic school activity breaks throughout the day	Worksite policies on tobacco cessation referral
Community	Establishing a town Farmer's Market	Converting unused railways to recreation paths	Media campaigns on the perceptions of youth smoking/tobacco use
Policies & Systems	Menu Labeling at Chain Restaurants legislation	Complete Streets legislation	Expansion of policies prohibiting tobacco on campuses

Table 1. Examples of Prevention Strategies for Nutrition, Physical Activity, and Tobacco.

Just as prevention efforts must involve all levels of the Vermont Prevention Model simultaneously to increase the potential for success, they must also cut across all relational, organizational, community, and governmental sectors. Consequently the model becomes multidimensional; it involves all levels of influence in every tier of our society. For example, *an individual's perceptions, opinions regarding natural resource management* (in this example land conservation/recreation) *are brought about, in part, by the individual's social relationships. The outing club to which this person belongs establishes organized events and sponsors a community initiative to convert defunct rail trails into recreation paths through state land. These community initiatives motivate leaders to drive policy change perhaps by conserving land tracts for recreational usage*. All parts of this elementary scenario that reinforce efforts aimed at improving health outcomes or providing

access to natural resources. The model aids us in identifying the interconnectedness of our efforts with those that may seem, at first glance, divergent. The initial disparity diminishes as we focus on solutions that, when they come to fruition, will underpin ECOS and the manner in which our region meets the future. The links between population health and the goals and recommendations of the other ECOS working groups are outlined below.

In order to be healthy, people need a safe, healthy place to live. This is discussed briefly in the health disparities section of this report. A more detailed analysis of housing in Chittenden County is contained in the Chittenden County Housing Needs Assessment. In particular the data on home ownership rates, ownership rates by race of household head, percent of households with racial minorities, and data on homelessness, people with disabilities, housing affordability, lead-based paint, and proximity of homes to public transportation illustrate the vital importance of housing to health. The Housing Needs Assessment report also complements our report in identifying and quantifying groups of people in Chittenden County who are likely to experience health disparities.

When looking at the Economic Analyses, several connections to the health of the population can be made. As noted in the health disparities section of this report, income is a measure of socioeconomic status and is a strong predictor of both an individual’s and the community’s health. The Economic Base Analysis discusses the trends in unemployment and how this affects future spending and economic activity and eventually decreases in business investments. Additionally, this report discusses income, both in respect to type of income, transfer vs. wages, and the sectors that seems to be growing in our county. Transfer income, which includes social security payments, student grants, and 3 Squares VT (food stamps), showed the strongest growth recently, which can be linked to more residents in our county being eligible for and receiving public assistance benefits. Retail, accommodations, and foodservice are sectors where employment opportunities are increasing in our county, however these jobs have low wages. For examples, the average annual income in the accommodations and foodservices sector is $13,293, and the federal poverty level for a family of four is $22,350. The rise in both unemployment and underemployment causes social and economic consequences. These consequences combine with poor physical and mental health outcomes. From the employer side of the issue, the largest increases in wage and benefits is reported to be due to increased healthcare costs. Worksite wellness policies along with the prevention recommendations presented in this report will help to manage and even prevent workers from developing chronic diseases, which will in turn lower health care costs to the employer. Such policies, have also been shown to improve employee moral and decrease turnover, which will also help the business’ bottom line.

The economic analysis also discusses the need for proficiency in local school in order to have a skilled workforce that will meet the needs of various sectors employment. While the education report describes in detail the health disparities that exist for those of lower education levels, it is important to note impact of health on learning; healthy students learn better. Health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance. Health-risk behaviors such as early sexual initiation, violence, and physical inactivity are consistently linked to poor grades and test scores and lower educational attainment. Supporting school health, and thus learning, will improve proficiency, graduation rates, the ability to

achieve higher education, which will impacts the future of workforce and economy of Chittenden County.

Thoughtful conservation, responsible management and judicious consumption of natural resources is integral to the health of all populations. Vermont's working landscape fortifies our economy, perpetuates the image that has come to define the Vermont brand and provides the foundation for a thriving local food system. The health of our people depends upon clean air, a safe water supply, local food sources and accessible, proximal recreational opportunities. Traditional development patterns undermine biodiversity, perpetuate overdependence on fossil fuels, fragment land tracts to the detriment of our air and water quality, habitats and the working landscape. The adoption of more-balanced, sustainable land-use patterns can have far-reaching ramifications. Reduction in our dependence on the automobile, and the redefinition of social norms surrounding car ownership has the potential to positively impact human health. As communities strive for denser, multi-use development that honors transportation choice the concomitant increase in mass transit and alternative transit options will improve air quality and augment opportunities for more active living. In short, there is no part of these analyses that stand alone. Each goal set forth by an ECOS workgroup has an influence, directly or indirectly, on any other facet of the plan.

The State of the Nation: What is killing us?

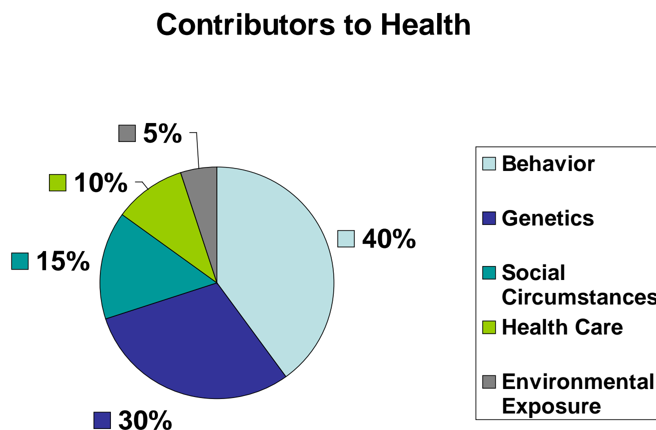


Figure 2. Contributors to Health.

A person's behaviors are the most important factors that determine health outcomes (figure 2). In discussions of health reform much attention is placed on health care and time spent in provider offices, which is an important piece. However, behaviors far outweigh the clinical factors.[6] Behaviors can be influenced, supported, or undermined by community design. Community design can also impact social circumstances, health care, and environmental exposures. For example, if recreation paths are only built in areas of moderate to high income, that reinforces the lack of opportunity for people living in low income communities to engage in physical activity. If health care facilities are sited

in locations that aren't convenient to public transportation, it creates a community where only those people who have cars have the ability to easily access the health care system. Also, a child care center located on a heavily trafficked road could expose children higher levels pollution from automobiles.

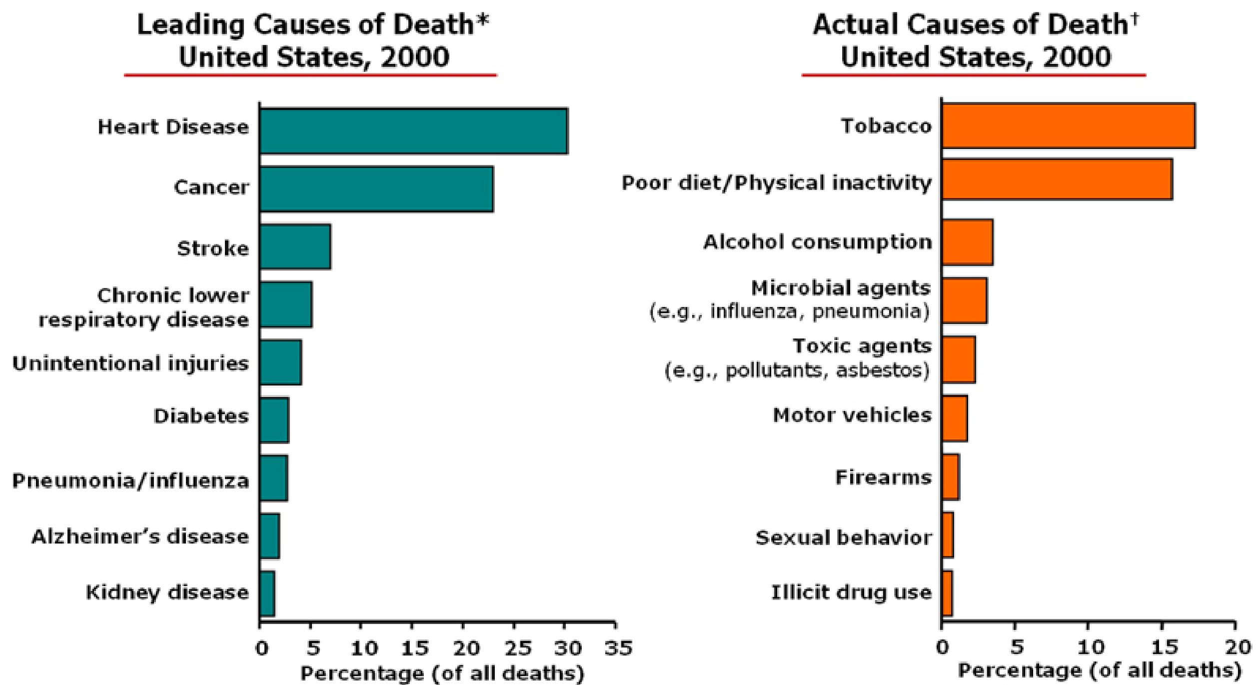


Figure 3. Leading vs. Actual Causes of Death in the Untied States, 2000.

Most chronic diseases have multiple potential causes and several factors and conditions that may contribute to a single death. Approximately half of all deaths that occurred in the United States in 2000 could be attributed to a limited number of largely preventable behaviors and exposures. Smoking and the deaths attributed to poor diet and physical inactivity account for about one third of all deaths in the United States (Figure 3). There is an increasing trend of overweight, and if it is not reversed, poor diet and physical inactivity will likely overtake tobacco as the leading cause of preventable cause of death. [7]

Our surroundings, or the environments in which we live, have a significant impact on choices and behaviors, and therefore health outcomes. Healthy community design is planning and designing communities that make it easier for people to live healthy lives. Healthy community design links destinations that promote health, such as schools, parks, grocery stores, and work places, via a transportation network that facilitates safe travel for pedestrians, bicyclists, public transportation users, and automobile occupants. Healthy community design can influence the overall health of a community by making healthy lifestyle choices easily available and accessible to all community members. It links the traditional concepts of planning (such as land use, transportation, community

facilities, parks, and open space) with health themes (such as physical activity, public safety, healthy food access, mental health, air and water quality, and social equity issues). [8]

CHITTENDEN COUNTY PUBLIC HEALTH DATA

The data analysis presented below represent the current state of chronic diseases and risk factors for these diseases in the Chittenden County area. Though Chittenden County is often presented as the healthiest county in the state of Vermont, risk factors for chronic disease are increasing, following trends that are happening state and nation-wide.

A note about the data. This report relies primarily on sources of data that are already available either through publicly accessible data websites, or through direct requests to organizations that do not currently publicly provide the specific data on an ongoing basis. For municipal and regional planning purposes, data at the county or town level would be the most useful, but is often unavailable. When available, Chittenden County data is used. Some data is not available by county but is available by the Burlington Health Service Area (HSA). Appendix A lists the towns included in Chittenden County and the towns included in the Burlington HSA. When county or HSA data is not available, we have used state-level data. Because of the low sample size, we are not able to obtain data on health measures at the town level. We do have some demographic and infrastructure data mapped by town, which was done by the Chittenden County Regional Planning Commission using publicly accessible data.

Demographics[9]

Chittenden County is one of 14 counties in Vermont, and is the most populated, with over 150,000 residents, which is 25% of the total state population. Chittenden County is home to the Vermont's largest city (Burlington), largest private employer (International Business Machines), largest hospital (Fletcher Allen Health Care) and the largest institution of higher learning (The University of Vermont). Close to one-third of all the jobs in the state are located in Chittenden County. Although not the state capital, Burlington and the immediate surrounding towns serve as the economic, cultural and educational center of the state. With the highest concentration of employment, education, retail and entertainment opportunities, this is the fastest-paced and most urbanized region of the state. Chittenden County's outer towns, however, particularly those to the East, are very rural and much more like the rest of Vermont. Table 2 provides a breakdown of age and education level for Chittenden County.

Age <18	20%
18 – 24	17%
25 – 44	26%
45 – 64	27%
65 +	10%
Education <HS	10%
HS Grad	23%
Some College	31%
College Grad	36%

Table 2. Age, Gender, and Education Levels of Chittenden County Residents, 2009.

Risk Factors that Contribute to Chronic Disease & Poor Health Outcomes[10,11]

Similar to the national leading causes of death, the leading causes of death in Chittenden County are cardiovascular disease, 32%, followed by cancer, 26%.[12] Tobacco use and physical inactivity and poor nutrition, which contribute to obesity, are major risk factors for these disease.

Tobacco

About 443,000 deaths each year are attributable to smoking (Figure 4). It is the number one killer, nationally. The trends in smoking rates have been decreasing both at the national and state levels.[13] Since 1990, smoking rates for adults have gone from 26% to 19% in 2010. For youth the rates have also declined: 28% in 1991 to 20% in 2009. As noted in the data above, residents locally are smoking less than the national and state average and rates continue to decline.

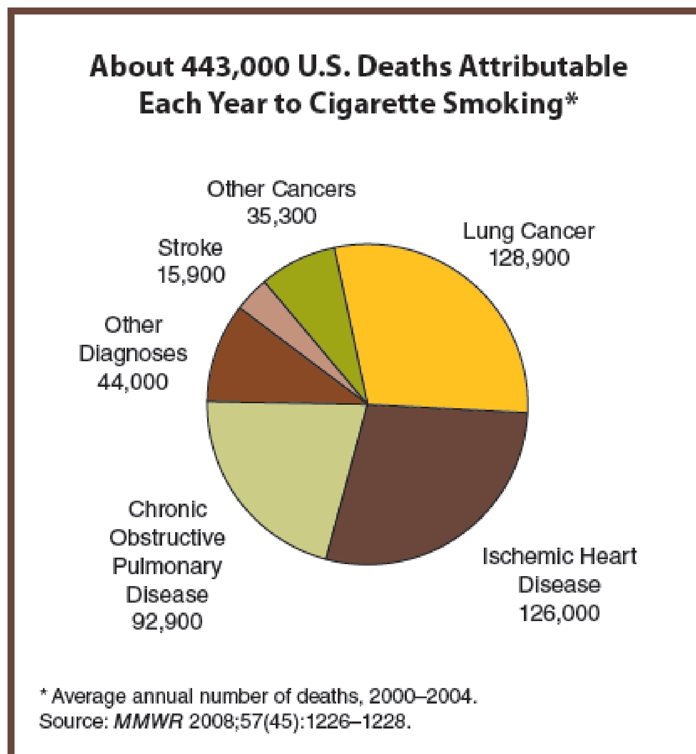


Figure 4. U.S. Deaths Attributable to Smoking, 2008.

Smoke-free environments provide strong reinforcement of nonsmoking as a social norm and have been shown to decrease consumption and increase cessation rates.[14]

In 1999, youth and adult smoking rates were 29% and 20% respectively.[11,15] Though smoking rates are decreasing, tobacco is still the leading cause of preventable death. About 16% of mothers smoke during pregnancy in Chittenden County.[16] Exposure to secondhand smoke causes early death and disease in children and adults who do not smoke themselves.[17]

Chittenden County fairs better than the state averages, where the smoking rate is 15% for adults and 13% for youth.[10,11]

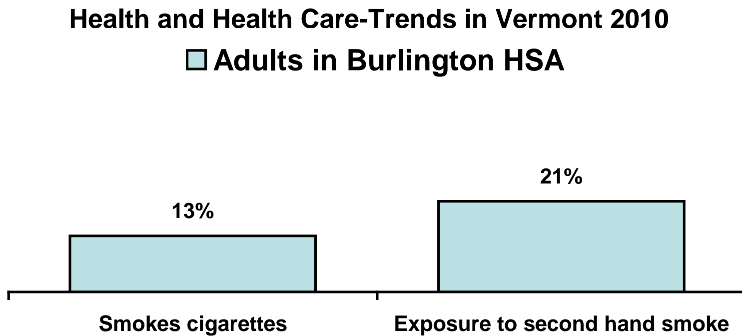


Figure 5. Smoking and Second Hand Smoke in Chittenden County Adults, 2010.

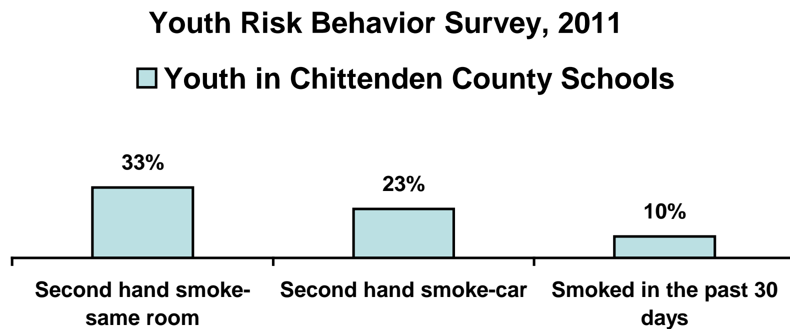


Figure 6. Smoking and Second Hand Smoke in Chittenden County Youth, 2011.

Additionally, research has shown that use of cigarettes and alcohol raise the risk of later use of illicit drugs, over 90% of adult cocaine users between the ages of 18 and 34 had smoked cigarettes before they began using cocaine. A recent study showed that nicotine makes the brain more susceptible to cocaine addiction. These findings suggest that lowering smoking rates in young people might help reduce cocaine abuse.[18]

Poor Nutrition and Physical Inactivity

Being overweight greatly increases a person's risk for many chronic diseases, including high blood pressure, diabetes, osteoarthritis, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances, breathing problems and certain cancers.[17]

Nationally, there has been a dramatic increase in obesity in the United States during the past 20 years and rates remain high. In 2010, no state had a prevalence of obesity less than 20%, 36

states had a prevalence of 25% or more, and 12 of these states had a prevalence of 30% or more. Vermont has one of the lower obesity rates in comparison to the rest of the nation, but Figure 7 illustrates that Vermont has had a similar upward trend in the rate of obesity. Vermont's adult obesity rate increased from 11% in 1990 to 18% in 2000, and then up to 24% in 2010. Similarly, though Chittenden County has the lowest rates in the state, trend data show that over time, rates continue to increase. In 1999, the adult obesity rate in Chittenden County was 14% and has increased to 18% in 2010.

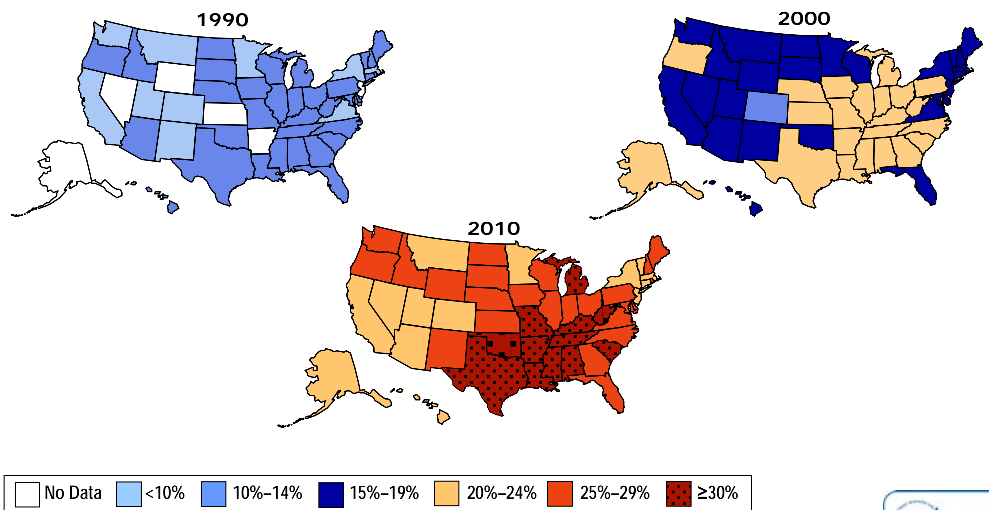


Figure 7. National Obesity Trends.

Achieving and keeping a healthy weight requires a balanced, lower-calorie diet and more physical activity. Even modest weight loss for people who are overweight can lower risk for chronic disease. Studies now suggest that breastfeeding lowers a child's risk for obesity.[17]

Over two thirds of adults in the Burlington HSA don't eat the minimum recommended amount of fruits and vegetables each day, four out of ten don't achieve the minimum recommended levels of

physical activity, and 14% engage in no leisure time physical activity (Figure 8)

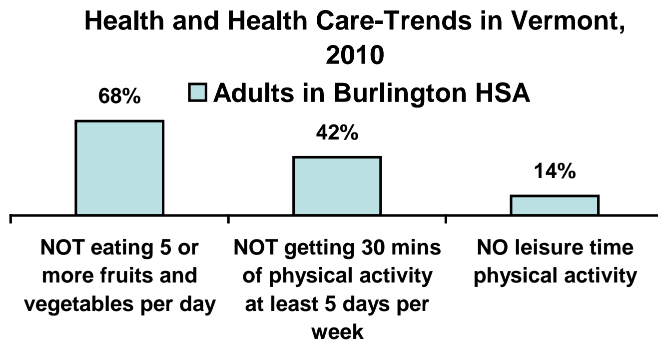


Figure 8. Nutrition and Physical Activity Among Adults, 2010.

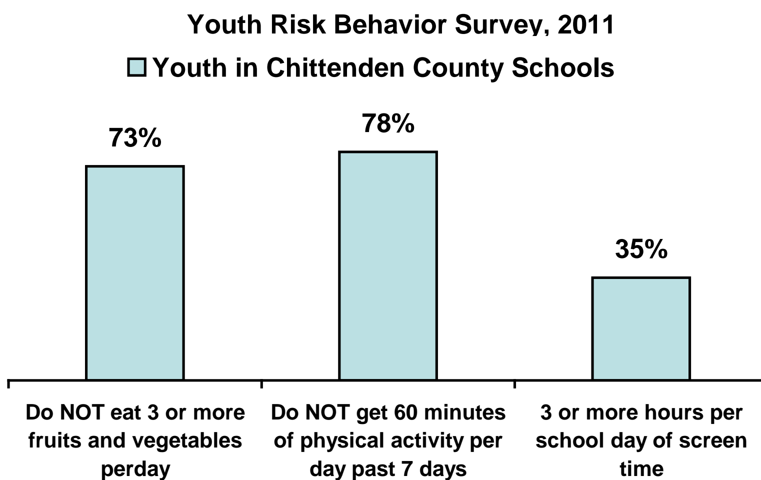


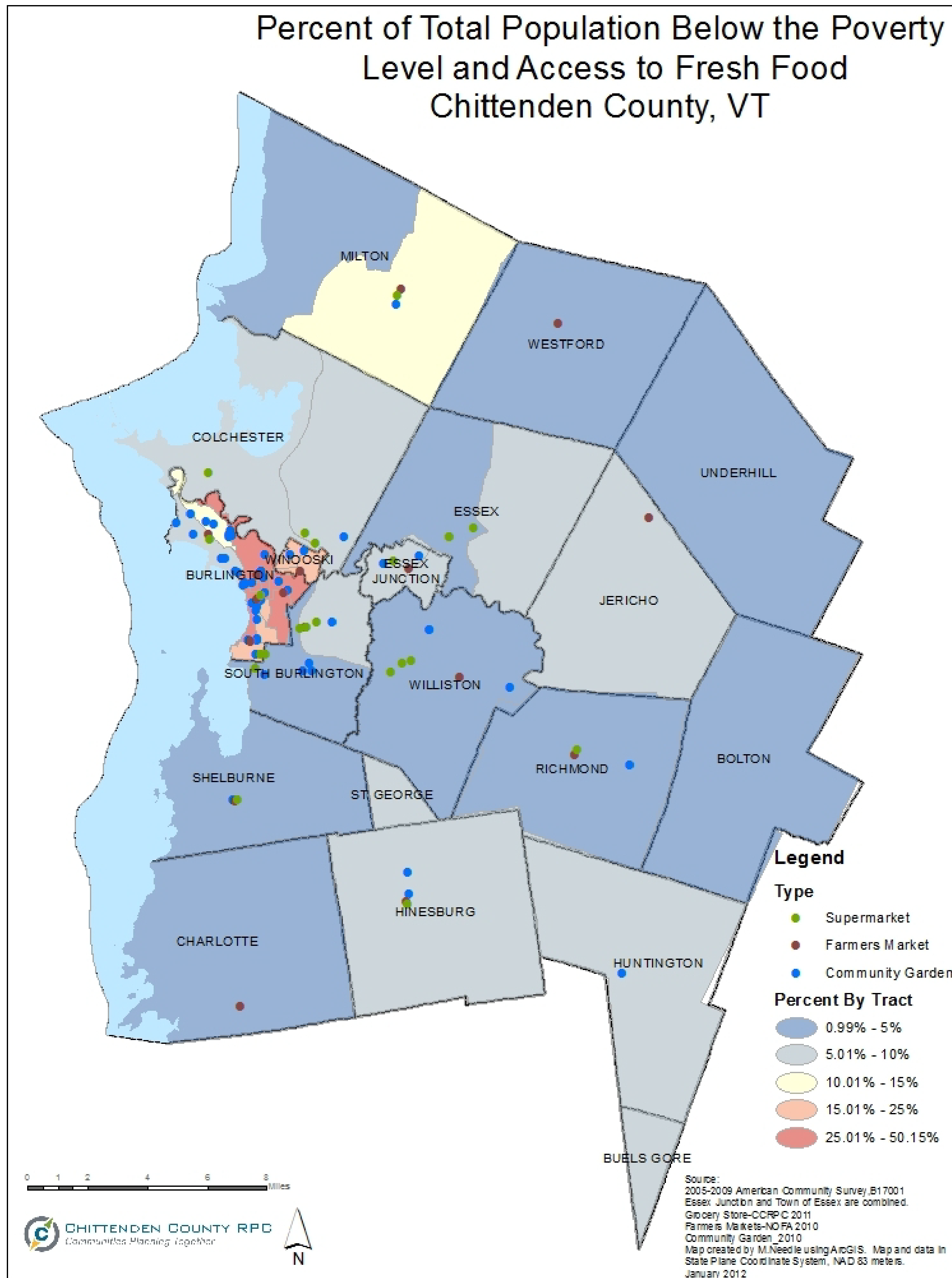
Figure 9. Nutrition and Physical Activity Among Youth, 2011.

People living in highly walkable, mixed-use communities are more than twice as likely to get 30 or more minutes of daily exercise as those living in auto-oriented, single-use areas. As density increases, the amount of physical activity typical residents get each day increases.[19]

Additionally, access to public transportation also positively impacts physical activity levels. People who used public transportation for any reason were less likely to be sedentary or obese than adults who did not use public transportation. With few exceptions, proximity to public transit stops was linked to higher transit use and higher levels of physical activity among adults.[20]

Residents in communities with a more imbalanced food environment typical of "food deserts" (large geographic areas with no or distant grocery stores) have more health problems and higher mortality than residents of areas with a higher proportion of grocery stores, when other factors are held constant. Outcomes worsen when the food desert has high concentrations of nearby fast food alternatives.[21]

Mapping is a tool that can be used to illustrate opportunities and barriers in a community to accessing the services and resource they need to choose healthy behaviors. Map A on the next page shows the location of grocery stores, farmer's markets, and community gardens in Chittenden County. Higher concentrations of stores, markets, and gardens are located in the urban core and surrounding towns as compared to the more rural areas of the county. This is not a complete map of the food system as food is available from many sources other than grocery stores and farmer's markets, but it does provide a glimpse at food access in Chittenden County. The map is overlaid with poverty data. Areas of the county with higher percentages of residents living below the federal poverty line appear to have good geographical access to stores, markets, and gardens but the map isn't able to illustrate access in terms of transportation. For example, a person or family living in poverty may have a grocery store that is only three miles away but if they don't have transportation, it is still not accessible.



Map A. Access to Fresh Food in Chittenden County.

Alcohol

Alcohol is a major factor in many preventable causes of fatalities—such as motor vehicle crashes, suicides, domestic violence and unintentional injuries. The age when a young person starts drinking is a strong predictor of alcohol dependence.[17]

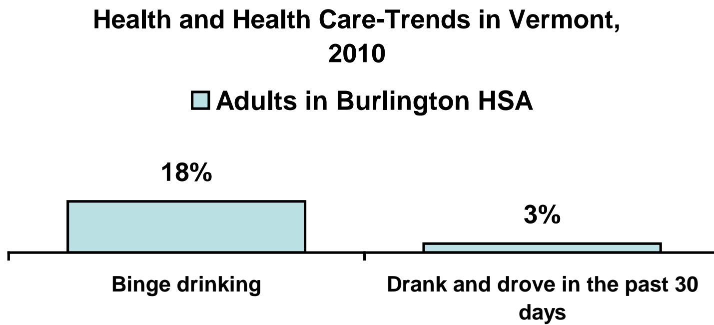


Figure 10. Alcohol Among Adults, 2010.

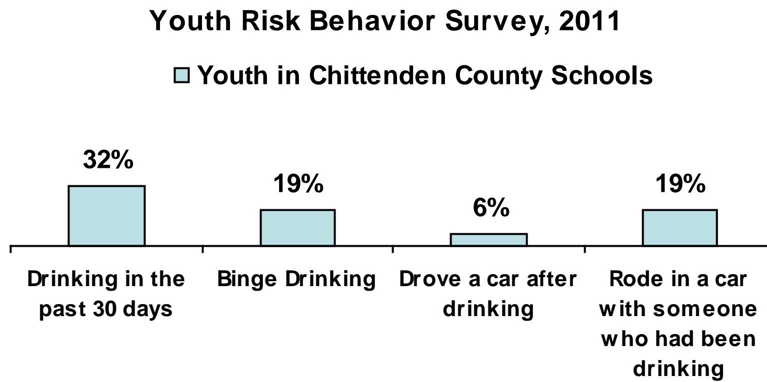


Figure 11. Alcohol Among Youth, 2011.

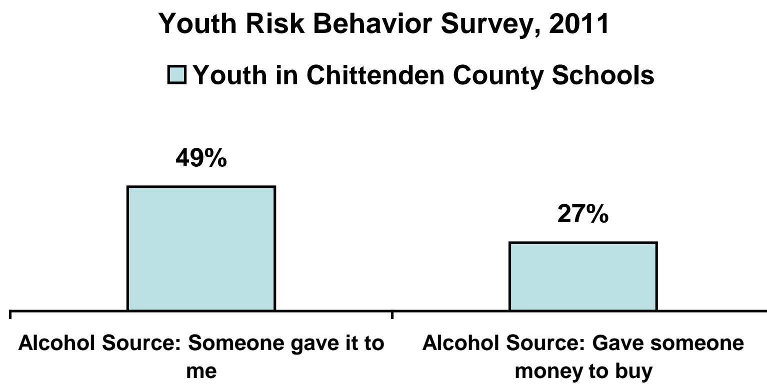
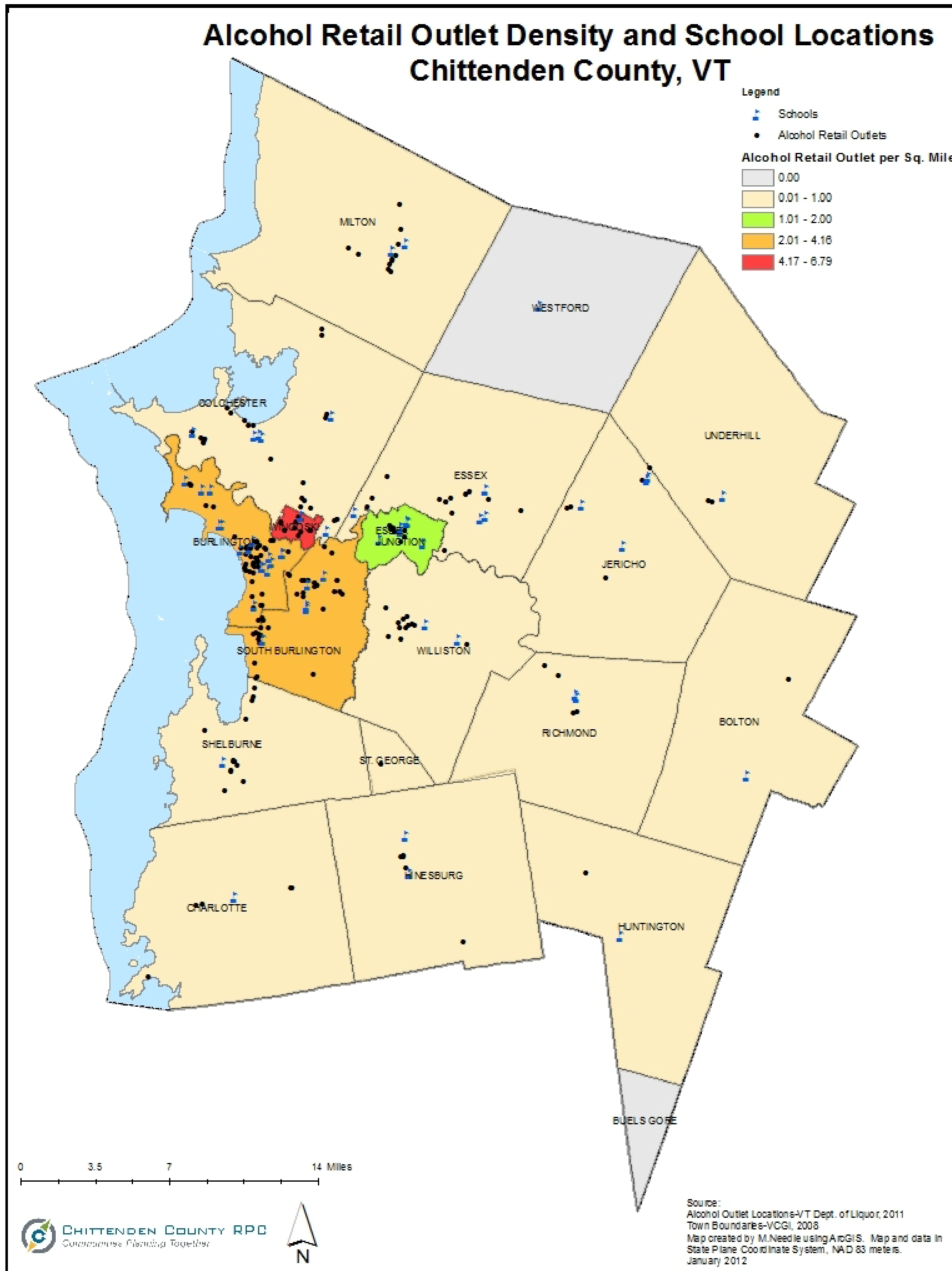


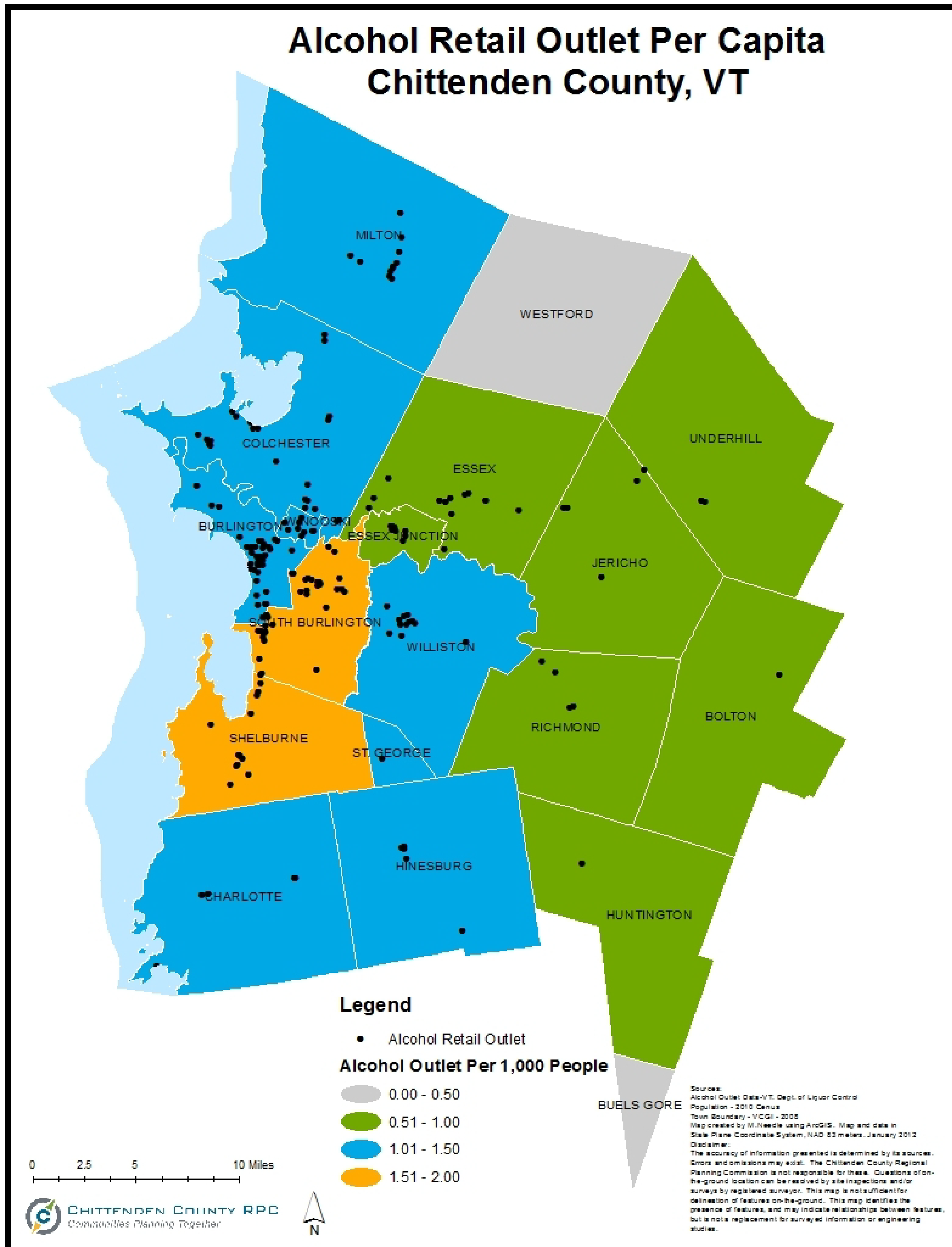
Figure 12. Alcohol Source Among Youth, 2011.

Map B, on the next page, shows alcohol retail outlet density by town. Winooski has the highest density of retail outlets that sell alcohol, followed by Burlington and South Burlington in the next tier, and then Essex Junction. It should be noted that this map does not provide a complete picture of access to purchasing alcohol as it does not include bars, restaurants and other venues where alcohol can be purchased. But outlet density is an important data point to look at in terms of public health and community design. national research has shown that alcohol outlet density is the single greatest predictor of violent crime in neighborhoods, greater than other social and economic factors.[22,23] Cirrhosis deaths, suicide, and assaults all increase when alcohol density increases. [24]



Map B. Alcohol Retail Outlet Density by Town.

On the next page Map C provides additional context to the picture of retail density by presenting the data overlaid against population levels. Per capita, South Burlington and Shelburne have the highest density of retail outlets that sell alcohol, followed by Colchester, Williston, St. George, Charlotte, and Hinesburg in the next tier.



Map C. Alcohol Retail Outlet Per Capita.

Chittenden County has the highest number of crimes in the state (Table 3), which is not surprising given the proportion of the total population. However, the County also has the highest crime rate at 65.69 per 1,000 people.[25]

Total Number of Crimes by County: 2009

Measures	Number of Offenses	Offense Rate (per 1,000)
Incident Date(02)	2009	2009
Jurisdiction(01)		
Total	29,816	47.99
Addison County	1,000	27.20
Bennington County	1,638	44.94
Caledonia County	1,240	40.45
Chittenden County	9,973	65.69
Essex County	117	18.01
Franklin County	2,480	51.74
Grand Isle County	255	33.55
Lamoille County	1,122	45.47
Orange County	843	29.07
Orleans County	1,011	37.03
Rutland County	3,338	52.76
Washington County	2,149	36.47
Windham County	2,514	57.82
Windsor County	2,054	36.11
Unknown(21)	82	
Missing(22)		

Table 3. Vermont Crime Data, 2009.

Chronic Disease- Adults[10]

Chronic diseases, such as heart disease, stroke, cancer, diabetes, and arthritis, are among the most common, costly, and preventable of all health problems in the U.S. Nationally, 7 out of 10 deaths among Americans each year are from chronic diseases. Heart disease, cancer and stroke account for more than 50% of all deaths each year. In the Burlington HSA, almost half of residents have a chronic disease (this is consistent with national data) and almost 1 in 5 have two or more chronic diseases (Figure 13). The most common chronic disease is arthritis, followed by obesity, and asthma (Figure 14).

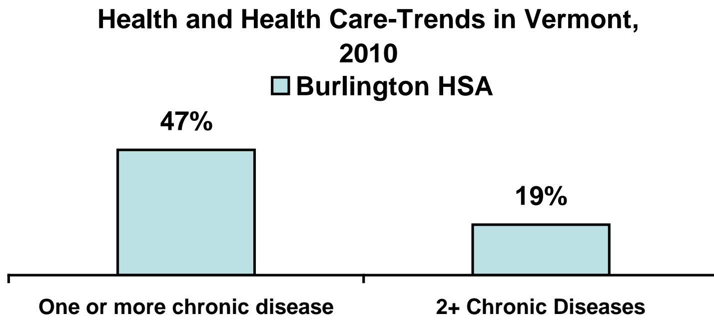


Figure 13. Chronic Disease, 2010.

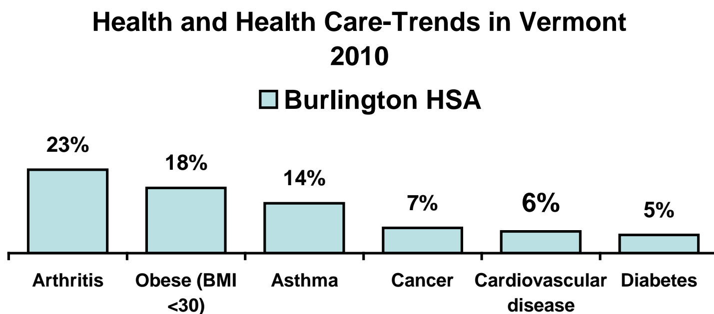


Figure 14. Chronic Disease Types, 2010.

Overweight, Obesity, & Asthma- Youth[11,15,26]

Overweight and obesity rates are also prevalent in youth. Being overweight or obese as an adolescent greatly increasing a person's risk for being overweight or obese as an adult.[27] One in five students in Chittenden County schools are either overweight or obese (Figure 15).

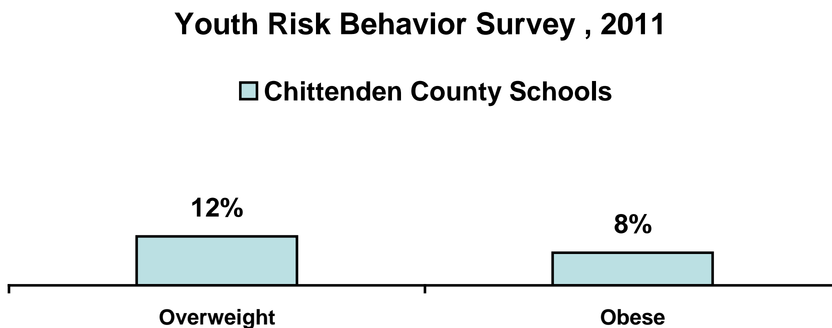


Figure 15. Overweight and Obesity Among Youth, 2011.

Children living near heavily trafficked roads experience decreased lung function, greater rates of hospitalization for asthma attacks,[28] and greater risk for all kinds of cancer.[29] Asthma rates for youth are 8-9% in Chittenden County (Figure 16).

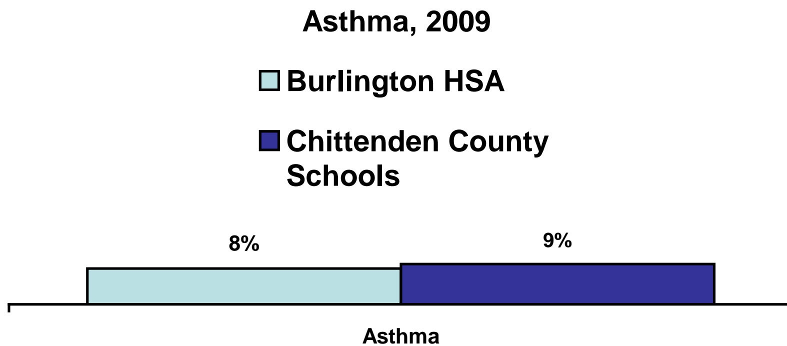


Figure 16. Asthma data from Behavioral Risk Factor Surveillance System and School Nurse Report Survey, 2009.

Health Disparities[30]

In addition to exhibiting some chronic disease risk factors that are trending in the wrong direction, Chittenden County residents do not share the bounty of good health, or the burden of poor health, equally. A health disparity is a measure of health that sets one group of people apart from another, amounting to real differences in years of healthy life.

Too many Chittenden County residents, especially those with lower socioeconomic status and residents of racial and ethnic minority, experience the consequences of health disparities that are largely preventable.

Income is the most common measure of socioeconomic status, and a strong predictor of the health of an individual or community. Lower income Vermonters report higher rates of depression and chronic conditions, such as obesity, asthma, heart disease, stroke and diabetes. They are also less likely to have regular physical activity and more likely to become obese than people with higher incomes- this trend starts early in childhood. They are also more likely to smoke.[31]

	Number served
State Health Care	31,803
3SquaresVT	16,441
Reach Up Financial Assistance	3,379
WIC	2,704

Table 4. Participation in Public Assistance, 2011.

Given that income and education are strong predictors of health, and that Chittenden County has relatively higher median income and education levels than the rest of Vermont counties, it is not surprising that many health indicators rank Chittenden County as the healthiest county in the state. But if we look more closely at the data below, the income disparity within our county is evident.

In 2008, 21% of Chittenden County residents were living at less than 200% of the federal poverty level.[17] Many of these individuals participate in federal and state public assistance programs in order to meet basic needs. Assistance is provided through subsidized health care (Medicaid and

Dr. Dynasaur for children and pregnant and post-partum women), financial assistance, and food assistance via 3SquaresVT (formally Food Stamps). The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides a nutrition counseling, breastfeeding support and a monthly food package to eligible participants. Currently in Vermont, all families that meet WIC eligibility requirements are able to participate in the program if they choose, and receive the full benefits of the program.

The WIC program by definition serves low-income families (those who are at 185% of the federal poverty level or eligible for Medicaid/Dr.Dynasaur). In Chittenden County, the WIC program serves more of the lowest of the low-income. WIC data from 2009 show that Chittenden County has the highest percentage of WIC participants living in poverty--71 % are living at or below 100% of the federal poverty level, while statewide 57% of participants are living at or below 100% of the federal poverty level.[32] For a family of four, the poverty level is currently set at an annual income of $22,350.[33] Additionally, WIC data shows that a higher percentage of Chittenden County WIC participants had no income at their most recent clinic visit (7.9%) compared to the statewide average (4.8%).

In addition to the participation numbers lists in Table 4, one in seven children in Chittenden County are food insecure.[34] In addition to living in areas that may not have easy access to supermarkets with inexpensive and good quality produce, meats, and dairy products, those living in poverty and with food insecurity are more likely to be obese for several reasons. Limited resources require families to purchase inexpensive foods that are sustaining: typically foods high in fat and starch. Families in poverty often skip meals to stretch the food budget and may overeat when food is available. Also, low-income families are often working several jobs and have little time to prepare meals and may rely on convenience and “fast foods” that are high in calories.[35]

Preventing obesity begins at birth through breastfeeding. Low income women are less likely to breastfeed. In Vermont overall, 87% of mothers initiate breastfeeding. Only 80% of mothers who participate in WIC initiate breastfeeding, compared to 93% of mothers who do not participate in WIC.[36] The American Academy of Pediatrics recommends that women breastfeed exclusively for the first six months, and breastfeeding should be continued for at least the first year of life and beyond for as long as mutually desired by mother and child.[37] In Vermont, only 68% of mothers report breastfeeding at least eight weeks. The number drops to 53% for mothers who participate in WIC and reaches 80% for mothers who do not participate in WIC. Employment is now the norm for U.S. women of childbearing age. In 2009 nationally, 50% of all mothers with children younger that 12 months were employed, and 69% of those employed worked full-time (35 or more hours per week).Employed women currently are less likely to initiate breastfeeding, and they tend to breastfeed for a shorter length of time than women who are not employed. Most employed mothers who are lactating must express milk at work for their children and should be provided with accommodations to do so. In Vermont, 13% of mothers report returning to work or school as a reason for stopping breastfeeding. This number drops to 7% for mothers participating in WIC, and reaches 22% for mothers who do not participate in WIC.[36]

Chittenden County has 10,149 residents who are from a racial or ethnic minority, representing 6.8% of the population, the highest percentage of any county in the state.[10] Nine percent of our WIC caseload has a preferred language other than English, 47 languages spoken in the Burlington School District and 26% of Winooski School District students are English language learners. Since 1989, a total 5,967 refugees have been resettled in Vermont, primarily in Chittenden County. The Bhutanese and Burmese are largest ethnic groups to be resettled in the most recent years (since 2008).[38] State level data show that youth of ethnic minority are more likely to report less security at school as evidenced by the following measures in Figure 17.

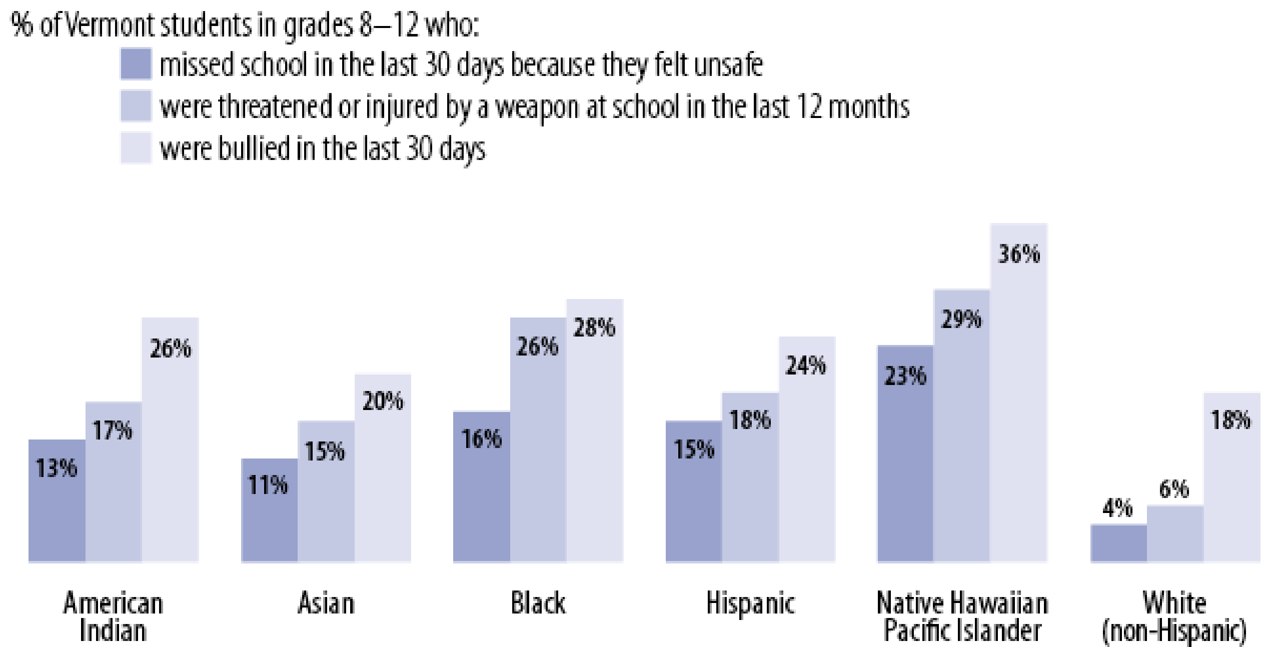


Figure 17. Bullying in Chittenden County Schools.

Figure 18 shows the percentage of Chittenden County residents reporting one or more days per week of mental health "not good, as well as those diagnosed with moderate to severe depression. In 2010, 2,092 clients were served by the Howard Center's Children's Services Programs and 590 adults were served by mental health outpatient programs. These service rates are less than the state average.[39] Depression correlates closely with income, education, and employment; people with lower incomes and less education report depression more often than those with higher socioeconomic status.[31]

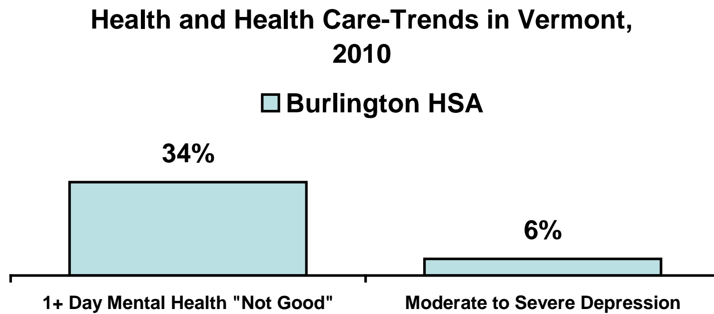
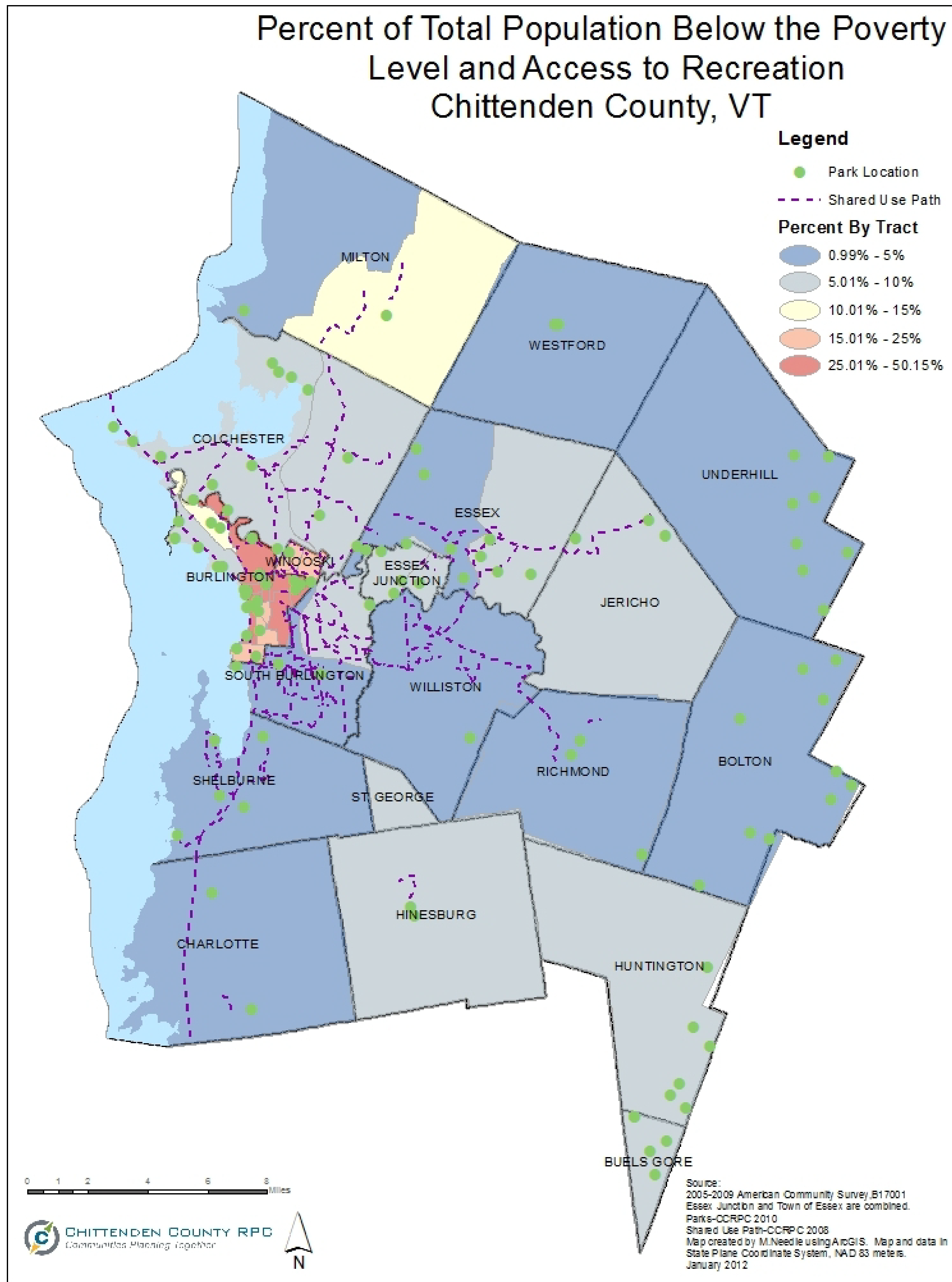


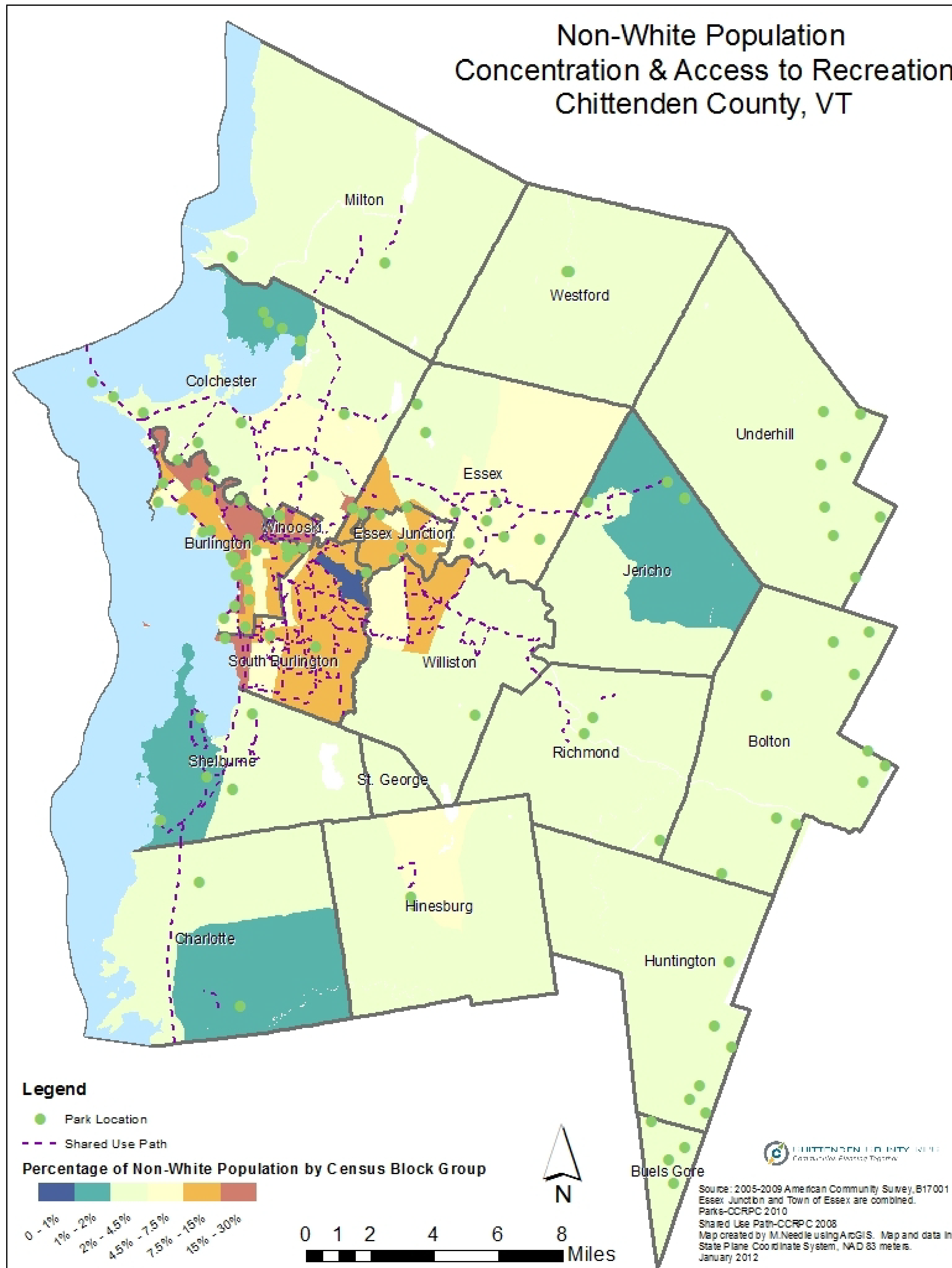
Figure 18. Mental Health, 2010.

In addition to parks and green space providing opportunities for physical activity, closeness to green space and nature can relieve stress.[40] Additionally a study which investigated the relationship between morbidity and the amount of natural land around a residential environment. The prevalence rates for several diseases were lower where there was more natural environments. Furthermore, depression and anxiety showed the strongest association to the amount of nature in people's lives, especially for children.[41]

On the next page, Map D shows public park location in Chittenden County. Similar to Map A that shows location of grocery stores, farmers markets, and community gardens, there is a higher density of public parks in the urban care and surrounding towns, with generally less density in the more rural parts of Chittenden County. However, park density is not as sparse in Underhill, Bolton, Huntington, and Buel's Gore as compared to the rest of rural Chittenden County. Overlaid on Map D is the percent of the population below poverty. Both Winooski and Burlington, which have the highest percentages of the population living below the poverty level, have comparatively high densities of park, which is a community design strength. Map E, on the following page, overlays the concentration of the non-white population against public parks. Again, there is a community design strength in that areas of the county that have the highest percentages of the population that are non-white are also the areas that have comparatively high densities of public parks.



Map D. Access to Recreation and Poverty.



Map E. Access to Recreation and Race.

RECOMMENDATIONS

Health starts where we live, learn, work, and play. All Chittenden County residents should have the opportunity to make the choices that allow them to live a long, healthy life, regardless of their income, education, race, or ethnic background. Community design is a tool that can raise the bar for everyone. The recommendations below are action-oriented steps that towns and municipalities can take to improve the health of their residents and communities.

The recommendations are derived from evidence-based strategies of the Centers for Disease Control and Prevention and the Substance Abuse and Mental Health Services Administration. The recommendations also support Vermont-specific desired outcomes. Healthy Vermonters 2020 is the framework that identifies health priorities for Vermont. This framework is used to measure the health status of Vermonters, to set goals for improved health outcomes, and to compare Vermont to the rest of the nation. Healthy community design work that towns and municipalities engage in will contribute to achieving the Healthy Vermonters 2020 objectives listed below:

1. Reduce tobacco use by adults and adolescents.
2. Reduce proportion of nonsmokers exposed to secondhand smoke.
3. Reduce proportion of persons engaging in binge drinking of alcoholic beverages.
4. Increase the proportion of adults and adolescents who meet current federal physical activity guidelines for aerobic physical activity and for muscle strengthening activities.
5. Reduce the proportion of adults who engage in no leisure time physical activity.
6. Reduce the proportion of adults (20+), children, and adolescents who are obese.
7. Increase the proportion of fruits and vegetables to the diets of the population.
8. Reduce household food insecurity and in doing so reduce hunger.
9. Increase the proportion of infants who are breastfed.
10. Reduce nonfatal motor vehicle crash-related injuries.

Recommendations to towns and municipalities for providing residents with the opportunity to be healthy where they live, learn, work, and play:

1. Use Health Impact Assessment (HIA) at the regional, municipal, agency, and organizational level to assure that planning decisions maintain or improve the public health. As defined by the World Health Organization, HIA is a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.

2. Support residents in choosing to live tobacco free through the following actions:

   Create municipal policy to:

   - Restrict retail store tobacco placement so that tobacco products are kept out of consumer view.

   - Restrict retail store tobacco advertising.

- Restrict the number, location, type and/or density of tobacco retail outlets in a community.

Create a policy or ordinance to:

- Designate public parks, beaches, and other open-air places as tobacco-free.
- Designate campuses of secondary education institutions and health care organizations as tobacco-free.
- Designate outdoor events as tobacco-free.
- Designate business campuses as tobacco-free.
- Designate new multi-unit apartment/condominium buildings as tobacco-free. In the case of complexes, designate half of the multi-unit structures as tobacco-free.

3. Support residents in choosing to achieve national recommendations for physical activity and nutrition through the following actions:
    - Enhance mixed used development to improve opportunity and access to physical activity and healthy food. Municipalities should regularly and periodically conduct an assessment to identify polices or infrastructure that limits mixed use development. Assessment results should be used to revise policy and develop plans to address infrastructure barriers.
    - Create policies and environmental supports for pedestrian and bicycle friendly communities.
    - Create policies and environmental supports to improve access to parks, recreation facilities, and open space.
    - Create policies and environmental supports to increase access to healthy, safe, local foods.
    - Create policies and environmental supports to protect the civil right of mothers to breastfeed in places of public accommodation (schools, restaurants, stores, and other facilities serving the general public). (Act No. 117, S.156, Public accommodations; breastfeeding, Approved May 28, 2002)
    - As workplaces themselves, municipalities should, at a minimum, achieve bronze level recognition as Breastfeeding Friendly Employers, and develop a plan for achieving silver and then gold level recognition. (http://healthvermont.gov/wic/food-feeding/breastfeeding/friendly-employer-project.aspx)

4. Support residents in choosing to be free from alcohol abuse and addiction through the following actions:

- Reduce, or limit the increase of, alcoholic beverage outlet density through licensing or zoning.

Create a policy or ordinance to:

- Prohibit or restrict the sale of alcohol in pubic places and at community events.
- Prohibit or restrict alcohol-industry sponsorship of community events.
- Restrict alcohol advertising and product promotion.
- Maintain or expand existing limits on hours of legal sale of alcohol.

SOURCES

1. Designing and Building Healthy Places, 2011, Centers for Disease Control and Prevention, October 15, 2011 http://www.cdc.gov/healthyplaces/

2. Tobacco Point-of-Purchase Advertising and Marketing, 2011, Campaign for Tobacco-Free Kids, http://www.tobaccofreekids.org/research/factsheets/pdf/0075.pdf

3. Best Practices for Comprehensive Tobacco control Programs, 2007, U.S. Department of Health & Human Services, Centers for Disease control & Prevention, National Center for Chronic Disease Prevention & Health Promotion, Office on Smoking & Health, October 2007.

4. Schilling, J and Linton, L.S. "The Public Health Roots of Zoning," American Journal of Preventive Medicine, Volume 28, Issue 2, Supplement 2 (2005): 96-104.

5. National Prevention Council. "National Prevention Strategy." Washington, DC, US Department of Health and Human Services, Office of the Surgeon General, 2011.

6. McGinnis, et. al. "The Case for More Active Policy Attention to Health Promotion," Health Affairs, Volume 21, Number 2 (2002): 78-93.

7. Mokdad et. al. "Actual Causes of Death in the United States" Journal of the American Medical Association, Volume 291, Number 10 (2004):1238-1245.

8. Integrating health into comprehensive planning, 2010, Design for Health. Aug 15, 2011, www.designforhealth.net/resources/integratinghealthissue.html

9. US Census Data and Population Estimates, Vermont Department of Health, 2009.

10. Health & Health Care – Trends in Vermont, Vermont Department of Health, 2010.

11. Youth Risk Behavior Survey, Vermont Department of Health, 2011.

12. Vital Statistics, Vermont Department of Health, 2008.

13. MMWR-Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses—United States, 2000–2004, November 14, 2008. Volume 57, Number 45.

14. Hopkins D, Fielding J, Task Force on Community Preventive Services. "The guide to community preventive services: tobacco use prevention and control reviews, recommendations, and expert commentary." American Journal of Preventive Medicine 2001, Volume 20, Number 2S (2001):10-15.

15. Behavioral Risk Factor Surveillance System, Vermont Department of Health, 2005-2009.

16. Maternal & Child Health Quarterly Report, Vermont Department of Health, 2010

17. Health Status of Vermonters, Vermont Department of Health, 2008.

18. Why Nicotine is a Gateway Drug, 2011, National Institutes of Health Research Matters, http://www.nih.gov/researchmatters/november2011/11212011nicotine.htm

19. Frank et al., "Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings from SMARTRAQ." American Journal of Preventative Medicine Volume 28, Issue 2 (2005): 117-125.

20. Active Transportation: Making the Link from Transportation to Physical Activity and Obesity, 2009, Active Living Research, Robert Wood Johnson Foundation.

21. Mari Gallagher Research and Consulting Group. "Examining the Impact of Food Deserts on Public Health in Chicago," 2006, October 15, 2011, www.marigallagher.com/site_media/dynamic/project_files/Chicago_Food_Desert_Report.pdf

22. Speer PW, Gorman DM, Labouvie EW, et al. "Violent crime and alcohol availability: Relationships in an urban community." Journal of Public Health Policy, Volume 19, Number 3 (1998):303-318.

23. Roncek DW & Maier PA. "Bars, blocks and crimes revisited: Linking the theory of routine activities to the empiricism of 'hot spots.'" Criminology, Volume 29 (1991): 725-753.

24. Campbell CA, Hahn RA, Elder R, et al. "The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms." American Journal of Preventive Medicine. Volume 37, Number 6 (2009): 556-569.

25. Vermont Crime Information Center, 2009.

26. Annual School Nurse Report, Vermont Department of Health, 2011.

27. Guo, S.S., Wu, W., Chumlea, W.C., & Roche, A.F. "Predicting Overweight and Obesity in Adulthood from Body Mass Index Values in Childhood and Adolescence." American Journal of Clinical Nutrition, Volume 76, Number 3 (2002): 653-658.

28. Lin et al., "Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic." Environmental Research, Volume 88 (2002): 73-81.

29. Pearson et al., "Distance-Weighted Traffic Density in Proximity to a Home is a Risk Factor for Leukemia and Other Childhood Cancers." Journal of Air and Waste Management Association 175-180 (2000).

30. Economic Services and WIC Data, Vermont Agency of Human Services, 2011.

31. The Health Disparities Report, Vermont Department of Health, 2010.

32. Income Distribution of WIC Participants, Vermont Department of Health, 2009.

33. *Federal Register*, Vol. 76, No. 13, January 20, 2011, pp. 3637-3638

34. Food security report. United States Department of Agriculture, November 2009.

35. The Paradox of Hunger and Obesity, 2006, Hunger Free Vermont, http://www.hungerfreevt.org/images/stories/pdfs/toolkit/hunger_and_obesity.pdf

36. Vermont Pregnancy Risk Assessment Monitoring System, Vermont Department of Health, 2009.

37. American Academy of Pediatrics, "Breastfeeding and the Use of Human Milk." Pediatrics, Volume 115, Number 2: 496-506 (2005). doi:10.1542/peds.2004-2491

38. Vermont Refugee Resettlement Program, 2010.

39. Department of Mental Health Participation in Services, 2010.

40. Wells NM & Evans GW, "Nearby Nature: A Buffer of Life Stress Among Rural Children." Environment and Behavior, Volume 35, Number 3: 311-330.

41. Mass J, et. al. "Morbidity is Related to a Green Living Environment." Journal of Epidemiology and Community Health, Volume 63: 967-973.

APPENDIX A: Chittenden County catchment area vs. Burlington Health Service catchment area

County	HSA
Bolton	
	Buel's Gore
Burlington	Burlington
	Cambridge
Charlotte	Charlotte
Colchester	Colchester
Essex	Essex
	Fairfax
	Ferrisburg
	Fletcher
	Grand Isle
Hinesburg	Hinesburg
Huntington	Huntington
Jericho	Jericho
Milton	Milton
	Monkton
	North Hero
Richmond	Richmond
St. George	St. George
Shelburne	Shelburne
South Burlington	South Burlington
	Starksboro
	South Hero
Underhill	Underhill
Westford	Westford
Williston	Williston

Winooski	Winooski