

Rural Obesity in the United States: Causes, Consequences, and a Need for Change

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Introduction

Obesity in the United States has reached epidemic proportions. Flegal, Carroll, Ogden, and Curtin (2010) reported that in 2007-2008, over two-thirds of adults (68%) and one in three children (34%) were either overweight or obese. In adults, the prevalence of obesity has doubled from 15% to 34% and has more than tripled from 5% to 17% among children and adolescents from 1980 to 2008 (Flegal et al., 2010). Although these numbers have stayed relatively constant over the past few years, the numbers are not decreasing and are beginning to threaten the quality of life for Americans. The health consequences associated with obesity are alarming and include diabetes, heart complications, and even death. In 2004, the Center of Disease Control and Prevention (CDC) estimated there are 112,000 deaths per year due to obesity related causes. Furthermore, Finkelstein, Trogon, Cohen, and Dietz (2009) estimated the United States spent \$147 billion of its healthcare costs on obesity in 2008 (up from \$78.5 billion in 1998). Therefore, it is vital to understand the causes of this epidemic and what remedies can be utilized to help eradicate it.

Obesity is not a phenomenon that exists consistently across every population in the United States. Trends differ between income and education levels, race and ethnicity, and even geographic location. Despite the consistency in the prevalence of obesity in the U.S. over the past ten years, there has been a shift from a greater likelihood of obesity among urban children to that of rural children (Tai-Seale & Chandler, 2003). Although research shows this trend exists, rural obesity in the United States has been relatively ignored. Very little research has been done to determine what makes it more prevalent than urban obesity. Glasgow et al. (2004) notes that “researchers have generally failed to investigate systemically whether the diet and obesity in rural areas differ from that in urban areas or to examine the impacts of rural/urban patterns in

diet and health.” This paper focuses on previous research and the gaps between findings to find the best remedies and solution for the problem. The critical need for understanding rural obesity has reached levels of vital importance as health care reform takes center stage in America’s focus. Michelle Obama and her “Let’s Move” campaign have set up a platform to significantly reduce childhood obesity by 2015 during a very critical time in policy reform and has the ability to affect millions (Let’s Move, 2010). However, these results cannot be achieved without careful consideration of each and every community in the United States and the way they impact obesity and poverty rates. Every aspect of rural obesity, from causes to its remedies, should be confined as a separate entity due to the unique nature of the contributing factor of rural communities in America.

Incidence Rate of Rural Obesity

The CDC defines overweight and obesity as “both labels for ranges of weight that are greater than what is generally considered healthy for a given height.” These terms are also associated with ranges of weight that increase the likelihood of certain diseases and health problems. To determine overweight and obesity ranges, the body mass index (BMI) is used as a ratio between height and weight. A patient’s weight and height are calculated. Their weight in pounds is multiplied by 703 and then divided by their height in inches squared to get a score. An adult with a BMI score between 25 and 29.9 is overweight, and a adult with a BMI of 30 or higher is considered obese. The obese range can be further broken down into obesity, severe obesity, morbid obesity, and super obesity. BMI acts as a ratio between weight and height and therefore does not measure the amount of body fat a person has.

BMI is currently what healthcare professionals use to determine obesity and therefore how the government classifies the prevalence of overweight and obese persons in the United

States. Data has been collected by the CDC for over 50 years, and therefore obesity trends have been observed in terms of age, gender, state, region, etc. One of the more recent ways in which obesity has begun to be examined is by looking at rates within urban and rural populations.

Obesity Rates Among Rural Residents

Research has begun to emerge that highlights the statistically significant differences between urban and rural rates of obesity. Patterson, Moore, Probst, and Sinogle (1998) indicated that obesity was more prevalent among rural (20.4%) than urban adults (17%), and that rural residents, in general, were 15% more likely to be obese than urban persons. Regression analyses indicated that among all of age groups, rural residents were at higher risks of obesity even when all other potential factors were held constant. These results were seen across other variables such as income, age, and gender. Further analyses were conducted to look at subgroups within these rural populations. For example, the most statistically significant differences were found between middle-age adults in both rural areas and urban areas.

More specifically, a variety of studies show alarming trends in rural, childhood obesity. For example, McMurray (1999) found that when he compared rural ($n = 1000$) and urban ($n = 1000$) school children in North Carolina that the rural children were 50% more likely to be obese than the urban children. Felton et al. (1998) also found that forty-nine percent of students in two rural counties in South Carolina were overweight (compared to the then national average of 21%). These are only a few examples of the disturbing proportions childhood obesity rates have reached in rural areas. However, the South Carolina Rural Health Research Center (2008) perhaps more modestly examined obesity rates in rural children across the county. They concluded that in 2003, 31.5% of rural children were overweight or obese, while only 30.4% of urban children were. Furthermore, rural children (16.5%) were much more likely to be obese

than urban children (14.4%). Before 1980, obesity was much more common in children who resided in large, urban areas (Dietz & Gortmaker, 1984). However, recently, studies show that there is a reversal where childhood and adolescent obesity have become worse in rural areas (SCRHC, 2007). A similar trend can be seen with rural adults.

Satcher (2001) reported that rates of adult obesity increase as population density decreases with rates being lowest in large, metropolitan areas and highest in areas with no more than 10,000 residents. The same trend is seen with adult women; the highest prevalence of obesity is also found in rural areas for women. Further research (Sobal, Trojana, & Frongillo, 1996) indicates that white, rural men and women were more likely to be overweight than those who live in urban areas (with other demographic factors controlled for)

Regional Data

High rates of rural obesity can also be seen in statewide data. Thirty-two states had obesity rates that were at least 25%. Six of these states had a prevalence of obesity equal to or greater than 30%. These six states (Alabama, Mississippi, Oklahoma, South Carolina, Tennessee, and West Virginia) are predominately in the Southeastern part of the country and are mostly rural (CDC). Regional differences between obesity rates are much more likely to be seen among rural residents. For example, Patterson, et al. (1998) found that “when analysis was limited to rural residents, the residents of the South, and the Midwest had significantly higher odds for an inactive lifestyle, other factors held constant, than residents of other regions.”

In addition to examining statewide data, the CDC conducted a study that examined obesity rates on a county by county basis. They used a randomized telephone survey that collected data from all 3,141 counties across the country. The studies indicated that there are “distinct geographic patterns in diabetes and obesity prevalence in the United States, including

high prevalence rates for diabetes ($\geq 10.6\%$) and obesity ($\geq 30.9\%$) in West Virginia, the Appalachian counties of Tennessee and Kentucky, much of the Mississippi Delta, and a southern belt extending across Louisiana, Mississippi, middle Alabama, south Georgia, and the coastal regions of the Carolinas.” Furthermore, very isolated areas that included tribal lands in the West (in the Dakotas, Montana, eastern Oklahoma, etc) also had high prevalence of obesity and diabetes, a condition where high blood sugar causes cells to not use insulin properly and can lead to a variety of complications (CDC). Figure 1 (see Appendix A) highlights the results of the CDC’s findings of obesity rates by county. This study became important for showing how obesity and the conditions that can result from it coexist in geographic patterns.

Sobal, et al. (1996) found that the differences between rural and urban obesity disappeared when additional demographics were controlled for. They used a national sample of 11,578 adults in rural, middle-sized and urban areas across the country. Data was collected from the Second National Health and Nutrition Examination Survey (NHANES II). They controlled for variables such as age, marital status, and education, all of which seemed to explain many of the differences. Sobal et al. (1996) also examined differences between men and women’s rates of obesity. Regression analyses showed that when everything was controlled for, differences in obesity percentages between urban and rural populations could not be seen. Although this study is not necessarily consistent with more recent findings, it is the first of its kind to suggest that discrepancies in obesity rates could be due to factors such as socioeconomic status and which are deeply confounded with living in a rural area.

Previous research and data has clearly demonstrated the discrepancies still visible in urban, obesity rates and rural, obesity rates. Despite these studies mentioned above, very little research has been undertaken examining why these differences exist.

Causes of Rural Obesity

In general, the culture of Americans has dramatically changed over the past few decades. These new trends in the way they eat, work, and live have culminated into the obesity crisis Americans are now faced with. Trust for America's Health (2009) highlighted dozens of causes of obesity in their report, "F as in Fat." For example, food patterns and school environment, can greatly impact behaviors involving nutrition and physician activity that have been shown to be correlated with obesity. Additionally, adult Americans consume 300 more calories daily than they did 25 years ago (Putnam, Allshouse, & Kantor, 2002). There has been a reduction in the amount of physical education time allotted during the school day and an increase in a variety of unhealthy food and beverage options in the cafeterias. Furthermore, many communities do not offer safe and clean options for exercise and adults work more hours than ever, leaving even less time for physical activity (Trust, 2009). Although there are numerous more factors that have been shown to lead to obesity, specific influences of the ones described above may have greater relevance for rural obesity.

Why is rural obesity different?

These trends in the way Americans eat and spend their leisure time can be seen in all areas of the country. Therefore, higher incidents of obesity in rural zip codes leave researchers with many puzzling questions as to why obesity is different across various populations. Although there is minimal research about the differences between obesity in rural and urban areas, there are very important distinctive characteristics about rural communities in the United States that can contribute to obesity in these areas.

There are several risk factors that leave certain populations more susceptible to being overweight or obese. For example, lack of physical activity, genetics, culture, and poverty have

been shown to lead to obesity. Furthermore, rural location has been shown as a possible risk factor for obesity. Lutfiyya, Lipsky, Wisdom-Behounek, Impanbutr- Martinkus (2007) performed analyses which showed that rural residence in and of itself is an independent risk factor for children being overweight or obese. They wrote that “known risk factors for children being overweight such as physical inactivity, television watching, and computer use accounted for some but not all of the increased risk, suggesting that rural residency is an independent childhood risk factor for being overweight or obese” (Lutfiyya, et al., 2007). Furthermore, studies like the one developed by Davis, Flickinger, Moore, Bassali, Domel-Baxter and Yin (2005) showed that children in rural Georgia were at a risk for being overweight or obese that could not be explained by demographic factors alone. These types of research indicate that various aspects of rural lifestyles make these residents more vulnerable to obesity.

Poverty

Risk factors such as socioeconomic status have been established as reasons why health is unevenly distributed across groups. The combination of poverty and a poor geographic location can be detrimental to the health of its residents. In 2006, the U.S. Census reported that 15.2 percent of rural Americans were living below the poverty line, compared with 11.8 percent living in urban areas. Wickrama, Wickrama, and Bryant (2006) examined the impact that community influence of poverty can have on adolescent obesity and how in part, obesity is social structured. Community characteristics contribute to obesity in ways that go beyond family characteristics and race/ethnicity. Wickrama et al. (2006) identify four ways in which community poverty can contribute to obesity: this type of poverty limits the availability of health resources in a particular community, community poverty can erode community norms and values, a lack of positive role models that support and promote healthy activities, and finally, community poverty leads to a

decrease in social trust and cohesion leading to lower collective efficacy. These factors of community poverty show how processes at the societal level can have impact on obesity in combination with the previously thought reasons for obesity.

In addition to sociological explanations for obesity in impoverished, tight-knit communities, biological reasons for these levels of obesity have begun to emerge. Daniel, Moore, Decker, Belton, DeVellis, Doolen, and Campbell (2007) found a negative correlation between the stress hormone, cortisol, and education with Body Mass Index (BMI) in blue collar women in rural North Carolina. This indicates that factors leading to stress, such as lower income and more stressful job situations, can be related to higher levels of obesity. Furthermore, education buffered this relationship. The more education the women had, the less likely they were to be obese. This study was important because it showed how stressors associated with low SES not only lead to activity patterns such as unhealthy diets but impact the neuroendocrine system in the body. Increased levels of the stress hormone have also been linked to diabetes, stroke, and cardiovascular disease, all of which appear at increased rates when individuals are overweight or obese (Trust, 2009).

One of the major factors that inevitability leads to poverty in rural areas is the idea of food insecurity. Food insecurity can be described as “an uneasy or painful sensations caused by the lack of food or recurrent and involuntary lack of access to food” (Anderson, 1990). There is an apparent contradiction between poverty and obesity. Most people incorrectly attribute a lack of food with malnourishment and the problems that are associated with not having enough nutrients such as reduced ability to fight infections and poor health. However, the definition of food insecurity addresses problems that run even deeper than these issues. Without resources to purchase enough adequate food, people often become overweight. The Center on Hunger and

Poverty (2010) describes food insecurity as occurring “whenever the availability of nutritionally adequate and safe food, or the ability to acquire acceptable foods in socially acceptable ways, is limited or uncertain,”

There are various reasons why food insecurity can occur, and the Center’s (2010) study showed many ways in which not having enough food leads to obesity such as the stress of making ends meet, overeating when food does become available, and being forced to choose between purchasing quantity of foods that satisfy hunger rather than fewer more expensive, nutrient-rich foods. Many of them stem from a lack of access to food, transportation, and income. However, there are less obvious factors such as food prices, personal behaviors and preferences, and a lack of knowledge about food preparation that also contribute to food insecurity, especially in rural areas (Morton et al, 2004). Unhealthy and limited options for food often lead to obesity and have widespread impact across these communities including health risks.

Food insecure households can be found in communities that possess specific social and economic characteristics. For example, higher rates of poverty and lower levels of education are associated with food insecurity and therefore poor health. Furthermore, rural areas are especially prone to food insecurity as it directly correlated with limited employment opportunities as well (Morton, Worthen, Weatherspoon, 2004). The rural economy often circulates around small businesses, which often cannot afford the skyrocketing costs of health care. Furthermore, due to the recent economic recession, the rural economy is losing jobs much faster than other parts of the country, which often leads to a loss of health care coverage (Morton et al., 2004). These and other factors associated with unstable job markets in rural areas can lead to less income to spend on food and no health insurance to cover problems associated with nutrition.

Food deserts are areas where affordable, yet nutritious foods are unobtainable. Morton et al, 2004 notes, “food deserts have relevance to rural areas that have sparse, increasingly elderly populations, stumbling economies, and high rates of poverty.” The National Association of Counties (NACo) (2008) reported that over the past 10 years, the average distance to the closest grocery stores for rural populations has increased, requiring more travel and difficult access. More research has been conducted examining how this works on a communal level and what underlying social and economic factors lead to this phenomenon in rural areas. For example, Hosler (2009) found a significant and inverse relationship between the prevalence of overweight or obese individuals and the availability of fresh fruit, dark green vegetables, and low-fat milk. The researchers argued that since these types of food have been shown to help maintain one’s weight that individuals have fewer obstacles controlling their weight than individuals in an unfavorable food environment.

Simply assuming a lack of access to adequate foods does not breach the surface of issues of food security in rural communities. Convenience stores with fewer options and higher price have begun to replace small-town grocery stores (Morton et al, 2004). However, even if supermarkets do exist within small communities, they are much more likely to be less well stocked with healthy and fresh food as it much difficult for distributors to reach them. Hosler (2009) also discovered that “stores in the low SES inner-town tended to skew their inventories toward inexpensive, high-calorie but nutritionally less feasible types of foods and cigarettes, while stores in other communities offered wider varieties of foods including fresh produce and low-fat products.” There is an increased reliance on processed convenience and fast food in rural areas (NACo, 2008). Furthermore, fast food restaurants are more likely to cluster around low-

medium wealth places (Morland, 2002). Even if rural residents wanted to make healthy options, they are extremely limited in what types of food they can bring home to eat.

Along with food security come the problems that arise from relying on public assistance to obtain food. NACO (2003) discovered that residents of rural communities reported an increased utilization of emergency food resources. Therefore, they are more likely to rely on their neighbors and the government than their urban counterparts. Programs such as the Food Stamp Program offer a food safety net for low-income families. However, they do not always meet all of the family's needs in rural areas because residents often rely on more expensive, local stores (Morton, et al, 2004). Smith (2009) investigates this issue further by providing a hypothesis that public assistance causes poverty through four different ways. She argues that it only increases income and does not encourage healthy choices as well as leads to obesity through the mental health issues being on food stamps, for example, creates. These explanations directly relate to rural obesity especially in the way that they limits rural residents' ability to use them at local farmers' markets and does not stress physical activity as a supplement.

Smith's (2009) hypothesis neglects to address the benefits of public assistance in rural areas. It often subsidizes a family's income and stresses the importance of nutrition early in life. However, these programs are often not utilized fully in small, rural communities. Older residents for example are often too proud or embarrassed to use these benefits. This is something that is pervasive throughout the community and becomes a norm from a promotion of self-reliance, independence and a fear of outsiders (Morton et al., 2004). Furthermore, institutions and civic structures control what services are available and how they are accessed. Without strong local governmental support and resources from nonprofit food banks, for example, public assistance cannot be distributed effectively in rural communities.

Physical Inactivity

Another important contributing factor to rural obesity is physical inactivity. Patterson et al. (1998) found that rural residents (62.8%) reported they were much more likely to be inactive than urban residents (59.3%) with physical inactivity as determined by self-reports. Furthermore, Eberhardt et al. (2001) reported that men in rural areas were much less active than their counterparts in larger communities, but found less discrepancy between urban and rural women's levels of activity.

In addition to adults' exercise patterns, children's physical activity has also been a part of recent studies. For this study, Patterson et al. (1998) defined physical activity as participating in 20 minutes of intense exercises, at least three days a week. They found that rural children (25.4%) were less likely to be physically active than urban children (29.3%). They were also less likely to participate in afterschool sports than their peers in urban areas. Rural children in the Midwest were the most likely to be physically inactive (26.1%), followed by the South which showed 26 percent of inactive children. Researchers concluded that rural children had different levels of physical activity as well as opportunities for afterschool fitness depending on what region of the country they lived in (Patterson et al, 2004).

There are various contributing factors that impact why physical activity occurs less in rural areas. For example, in rural, Eastern Kentucky, the CDC (2000) discovered that 85% of Kentuckians reported no regular physical activity. They held the lowest non-leisure time physical activity in the nation. Unsurprisingly, they have the fourth highest obesity rate in the country (Mokedad et al, 2003). Similarly, the rural Appalachia region presents its challenges for physical activity. For example, rugged terrain and lack of large, indoor spaces such as malls, make it very difficult to create fitness programs. Health clubs are practically nonexistent and geographic

isolation furthers this problem (Mokdad et al., 2003). Communities like the ones visible in rural Appalachia present new challenges for how one begins to look at addressing physical inactivity as a cause of rural obesity. Patterson et al. (1998)'s results of the strong regional effects of physical inactivity were more visible and pronounced among rural residents. These studies and other research demands a closer and unique look at the reasons for differences in physical activity levels between rural and urban environments.

Culture

In addition to limited resources that lead to food insecurity and physical inactivity, there are unique qualities about living in small communities that can also impact why obesity rates are unique and higher in these regions. For example, a strong "mistrust in outsiders" often forces public assistance programs not to be utilized. A deep attachment to the family and self-reliance impacts how rural residents seek health care and preventive medicine. Furthermore, the way in which "country food" is prepared is often associated with traditional, less nutritious means.

Researchers argue that this and other contributing factors to obesity may be still practiced because there is not the same pressure to conform to being thin in rural areas of the country (McIntosh, & Sobal, 2004).

Examining the unique aspects of the lifestyles of rural areas is essential to determining whether or not current policies aimed at reducing obesity are sufficient and poignant for these types of small, and often traditional communities.

Consequences of Obesity in Rural Communities

The health impacts of obesity have become well known and documented in the past few decades as more research is being done on obesity and its effects. For example, the American Obesity Association listed obesity as an independent risk factor for 32 health conditions

including various cancers, cardiovascular disease, diabetes, stroke, and birth defects. The Report of the National Taskforce on Obesity (2005) cited that obese and overweight individuals are at higher risks for psychological disorders, osteoarthritis, hypertension, and premature death. Trust for America's Health (2009) reported that obesity has now been attributed to be the cause of 20 percent of cancers in women and 15 percent of cancers in men. Adults diagnosed with depression are 60 percent more likely to be obesity, and obesity in children has been shown to be associated with higher risks of anxiety, depression, lower self esteem, and behavior problems (Trust , 2009). Furthermore, they also reported that nine of the ten states with the highest rates of hypertension are also in the top two states with highest obesity rates. In 2004, the CDC announced that obesity was the second leading cause of preventable death for Americans. Mokdad, Marks, Donna, and Gerberding (2004) concluded that 17 percent of all deaths were related to poor diet and a lack of physical activity. Furthermore, Finkelstein, Fiebelkorm, and Wang (2004) found that the number of deaths due to the same factors has increased 33 percent in the past ten years alone.

The Uniqueness of Rural Health

The consequences of obesity are numerous and detrimental to the health outcomes for individuals. However these consequences become confounded with additional factors when residents of poor, rural communities suffer from obesity. These problems are often spread throughout the community, and there are limited resources for how to deal with him. Research indicates that rural residents are 10 to 20 percent less likely to receive regular check-ups and preventative care than urban residents(Casey, Call, & Klingner, 2000). Due to remoteness and a lack of resources, rural areas often do not have adequate health centers, hospitals, and specialists are very rare. Fordyce, Chen, Doescher, and Hart (2006) found that there were only half as many specialists for every 100,000 citizens of rural areas compared to urban communities. These

reduced options for health services lead to few medical visits and less optimal health outcomes (Zoorob, & Mainous, 1996). The Rural Assistance Center (2010) noted that “the higher rate of rural obesity may be a driving force behind the higher rural rates of chronic diseases that have been found in some studies.”

Despite a limited amount of data and research, progress is being made which shows the disparities in health outcomes due to obesity related conditions. For example, recent research conducted by in 2010 showed that rural residents are 16 to 19% more likely to have diabetes than the urban peers when all other demographic differences were controlled for. In 2002, the CDC reported that the highest rates of heart disease deaths for men could be found in the South’s most rural counties; these rural areas had the second highest rates of death for women. A 1996 National Health Interview Survey indicated that heart disease was almost one and a half times more prevalent in non-metro areas than metropolitan areas. The same trend was seen with hypertension, or high blood pressure.

The 2005 NACHHS report acknowledges several ways in which rural areas cannot keep up with the staggering rates of obesity due to various barriers in healthcare. For example, small, rural hospitals are often not up to date with current knowledge of services. There is often a lack of public health capacities and a lack of coordination between local organizations and providers. Furthermore, geographic isolation often leads to a lack of transportation, a problem quite visible in rural Arkansas. Although the small town of Helena, in Phillips County Arkansas is fortunate to have Area Health Education Center (AHEC) the most common problem with their health education programs is transportation. They offer healthy cooking classes, diabetes education, and wellness programs. However, the size of the county and the financial status of many of its residents do not allow for these resources to be utilized. In 2006, the Agency of Healthcare

Research and Quality found that fourteen percent of rural patients traveled more than 30 minutes to a physician, while only 10 percent of urban patients had to.

Diabetes

The connection between diabetes and obesity is very well-known. More than 80 percent of people with type 2 diabetes are overweight. Much in the same way there is limited research on differences between urban and rural obesity, there is very little national data comparing urban and rural residents with diabetes. However, Krishna, et al. (2010) examined the urban-rural differences in diabetes rates as well as access to preventative care. Previous research indicated that rural and socioeconomically disadvantaged people are less likely to received preventative diabetic care such as hemoglobin testing, foot and eye examinations. For example, Andrus, Kelley, Murphey, and Herndon (2004) compared diabetes management practices at a rural and urban clinic in Alabama. They found that the rural practice had fewer patients who achieved goals set by the American Diabetes Association for those diagnosed with diabetes. Furthermore, rural patients were much less likely to receive preventative services such as lipid profiles, vaccinations, and foot exams.

Krishna, et al. (2010) compiled data from surveys administered in 2001 and 2002, questionnaires, and phone interviews. Researchers concluded that the prevalence of diabetes was higher among rural residents (7.9%) than urban residents (6.0%). Similar to Andrus, Kelley, Murphey, and Herndon's (2004) results, they found that rural residents with diabetes were less likely to receive annual eye examinations, feet checks, and diabetes education. A lack of compliance from rural residents diagnosed with diabetes indicates that significant barriers are in place for receiving services in rural communities. Diabetes is one example where obesity greatly impacts the health of individuals who are in turn affected by the rural area in which they live.

Remedies

Although strides are being made to eradicate obesity in the United States, not enough attention is being focused on rural areas. More specifically, policies should be aimed at prevention, there should be a better distribution of available resources, and special attention of the cultural aspects of rural regions should be examined. Furthermore, current remedies only address obesity and do not look at contributing and correlating factors such as poverty, race and ethnicity, and geographic location. Aiming programs at specific, deserving communities may have a much more direct and intense impact rather than thinly spreading out limited resources. Rural obesity should be examined separately from obesity in larger cities due to additional, structural problems that arise in remote areas. Finally more research needs to be conducted so that the causes of rural obesity can be examined independent of nationwide obesity rates.

Grants and Funding

A major problem that affects buyers' choice of food in rural areas arises from geographic isolation. From food deserts to a lack of local services, rural residents often do not have the resources to prevent or deal with obesity problems. The CDC's Division of Nutrition, Physical Activity, and Obesity (DNPAO) helps fund states to address problems of obesity by developing infrastructure and planning. However, only 25 states are currently being funded. Furthermore, although many proposals such as the various components of The American Recovery and Reinvestment Act mentioned above claim to be geared towards small city/rural areas, their definition of "rural" limits the smallest communities. The NACHHS reports that small communities are defined as ones with less than 800,000 people. Communities such as ones that exist in Phillips County, Arkansas lack the resources to compete with larger areas in this regard. The counties and towns that need the programs and funding the most cannot get the support from national and even state wide strategic plans. Rural communities vary in the same ways that metro

and non- metro areas do. Some rural areas are on the edges of large cities while others only have populations of a few thousand. Some have more resources because they are contained in larger states with more funding. Understanding that “rural” communities come in a variety of ways will help researchers and funders between target at-risk and deserving populations.

Furthermore, developing plans is not sufficient. Many state plans only acknowledge a need to get funding and do not provide tangible means of securing funding or how plans will be implemented. Although the CDC reports 43 states have state plans of action, only 10 directly cite how they will obtain funding (Trust, 2009). Additionally, states need to be very specific about how results will be measured to ensure programs can continue if successful. When opportunities do arise for funding in rural areas, often there is no public infrastructure to have programs.

Increasing funding to general public health facilities will give outlets for communities to be able to support obesity prevention. Stronger places such as the Delta Area Health Education Center (Delta AHEC) are well-established locations that have the ability to sustain programs. However, attempts to bring funding and obesity related initiatives are futile without established support. Remedies should be geared at establishing more proficient public health facilities to focus on prevention before they can bring initiatives into small communities.

Furthermore, when changes like this are made, it is often very difficult for information to spread in rural communities that are less connected due to less reliance on technology such as the internet. More money and resources should be put into identifying ways of educating the public about updates and policy changes. The NACHHS (2006) report discusses the advantages of health information technology (NIT) in improving the quality of health care for rural Americans. They reported that it would make health care more effective, patient-centered, and efficient.

They discuss how improving the infrastructure of rural communities with an increase in technology can help improve hospital as well as patient-doctor communications.

Education Policies

Another way in which health care can be improved on a societal level is the use of Health Area Education Centers (AHECs). Although AHECs currently operate in 45 states, there are many more communities that could use the organization, created to help recruit, train and retain health professional in undeserved, rural areas of the country (NACHHS, 2008). They have the ability to reach the community on a much larger scale and incorporate various organizations into planning and new programs. It also has the potential to help foster cooperation and collaboration between programs at the local, state, and federal levels as well as training community leaders to collaborate and help develop the community through initiative (NACHHS, 2008). This has special relevance for obesity in that it becomes such an epidemic at the societal level and must involve the entire community to be educated about it to begin to combat it.

Through centers like the AHEC and throughout the school systems, education about obesity, its epidemic proportions, and consequences should be distributed in more effective ways. Without a current knowledge of healthy habits, there is no point in trying to implement programs. The first thing that needs to be addressed is the apparent “obesity as a way of life” culture that often exists in rural communities. Obesity is not viewed necessarily negative in these cultures (NACHHS, 2005). Often times, fat can be seen as healthy and desirable. It is especially viewed that way with babies and infants. However, with the staggering rates of childhood obesity, parents are clearly misinformed about how to feed their children. More distributive information should be given when women received programs such as WIC and Food Stamps.

Food stamps receive a great deal of criticism in relation to obesity. Because unhealthy foods are less expensive, food stamps do not give buyers enough financial power to choose nutrition over cost. Kupillas and Nies (2007) conducted a study comparing two different types of buyers. The first buyer purchased healthy foods for a total of \$22.35 and the second buyer bought unhealthy foods for an equivalent amount of \$22.65. Shopper number one was only about to purchase 5,044 calories while shopper two purchased 15,592 calories. Shopper number two was over the 2,000 calorie a day USDA recommended amount of food with 2,227 calories/day while shopper two could only average 721 calories a day with the food bought. Ultimately, the Food Stamp Program cannot be blamed for the obesity crisis in America. However, measures should be taken to restructure it so that participants can receive discounts or incentives for buying healthier foods. Increasing allowances could also allow buyers to obtain more healthy options for their families. Kupillas and Nies (2007) note the benefits of these changes in that they could help offset the cost of obesity-related health care given through Medicare and Medicaid programs. Further assistance should be offered to participants in the form of education about healthy foods through distributive information, nutrition and cooking classes, and counseling.

More education needs to be provided for children as staggering rates of childhood obesity in these areas continue to grow. Children who are able to learn in schools can take their knowledge about healthy habits home to their families. In the small community of Marvell, located deep within Phillips County, Arkansas, the USDA used a summer camp of children as a pilot group for research habits of the local residents. They tracked the children's activity level throughout the day and gave the children a different, new food every day to try. Most of the children had never tasted a blueberry and many of the vegetables that are grown locally. They were able to learn about their community and small ways in which they can begin to have

healthier lifestyles. More directive programs like this have greater impacts on the community than ones that are geared towards the whole state of Arkansas, which does not have the same problems areas like Phillips County do (USDA).

Obesity prevention needs to be tied into the curriculum and the food served in schools. Arkansas set many precedents in 2003 by becoming the first state to require children's BMI to be recorded and tracked throughout school (Trust, 2009). Trends show that there was a decrease in obesity rates of their public school students in response to what they did with the information they collected through an evaluation of the program. Although this is a start for schools, the data that is calculated might not be being used in the most effective ways. Researchers should take this data and apply it to in school and after school initiatives. Furthermore, the National School Lunch programs should be making more efforts to provide healthy options in schools. Trust for America's report (2009) argues that the nutrition guidelines need to be revised and the USDA should set more strict standards for competitive foods in schools. Furthermore, schools should be eligible to receive grants to implement more efficient health education programs into their curriculum as well as more innovative ways of keeping children active during the day. Rural committees are often focuses on improving their curricula and test scores of their students to get their schools systems up that they neglect to realize the importance of maintaining their students' overall health and well-being.

What Local Communities Can Do

Even without a lack of government support, local communities should be doing more in educating their residents, especially in schools. Low-population density often leads to barriers for local government leaders. With fewer stakeholders, there are fewer health experts and fewer people to have as partners in the fight against obesity. Because of this, smaller communities'

grant applications look much less impressive than those that can bring more to the table with more partners, resources and infrastructure. Furthermore, rural communities create more challenges with less local government staff. Therefore, smaller governments cannot apply for as many government grants and funding as well as less time devoted to doing so. (NACo, 2008). Giving these smaller communities more resources to develop grants, proposals, and funding ideas can help jumpstart community wide efforts.

One way in which obesity acts as a unique entity is the way in which cultural aspects within the community tend to sustain the epidemic. There are several ways in which this occurs. First of all, rural areas often have a different concept of what is healthy and what is beautiful. Furthermore there are cultural motivations which influence whether or not people will seek treatment, especially in the realm of obesity treatment often due to fear of medicine and stigmatization. Information needs to be distributed to show residents how to utilize community public health, healthcare services, and support programs. Rural areas often lack grocery stores and healthy co-ops and instead rely on an abundance of eating out and prepared foods. Their reliance on cars and motorized transport exacerbate this issue. Rural communities are often very spread out, making it difficult to walk to places where they need to go. In conclusion, cultural aspects of obesity should be a main priority when examining rural communities.

Conclusion

In conclusion, these are just a few ways in which the government, state, and local communities can begin to think about eradicating rural obesity. Although the list is much more comprehensive in nature, these remedies have been covered because they are more feasible and relevant to rural communities today. Most of the resolutions listed above involve more funding and more knowledge in some level. Through more research such as the studies being conducted

in rural Arkansas and a better understanding of how obesity impacts the community at large, rural areas can begin to pool resources and funding to bring about the much needed attention the obesity epidemic deserves. Addressing the determinants that constitute inequalities in health distribution in rural areas such as poverty, geographic isolation, and culture will have deeper and more lasting impacts for reversing the current trends in obesity.

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Appendix A

Figure 1: Percentage of persons who are obese, by county. (2007, CDC)

