

## **NRHA Policy Paper: Rural Obesity**

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### **I. Rural-urban differences in obesity prevalence**

Obesity remains an important clinical and public health issue given recent estimates that approximately 38 to 40 percent of adults and 19 percent of youth in the United States are obese.<sup>1,2</sup> The prevalence of obesity is particularly high in rural areas, and rural-urban disparities in obesity appear to be growing. Based on 1999 to 2006 National Health and Nutrition Examination Survey (NHANES) data addressing obesity using objectively measured height and weight, the prevalence of adult obesity was nearly 36 percent in rural areas compared to 30 percent in urban areas.<sup>3</sup> Adult obesity prevalence increased to 40 percent in rural areas and 33 percent in urban areas based on 2005 to 2008 NHANES data.<sup>4</sup> Researchers have recently estimated that nearly 39 percent of men and 47 percent of women living in non-metropolitan areas (MSAs) are obese compared to 32 and 38 percent of men and women in large MSAs.<sup>5</sup> Among youth, the current prevalence of obesity is approximately 22 percent in non-MSAs compared to 17 percent in MSAs.<sup>6</sup>

### **II. Obesity as a factor contributing to rural-urban health disparities**

Obesity is an established risk factor for multiple adverse health outcomes including heart disease, stroke, diabetes, certain types of cancer, sleep apnea, and problems during pregnancy.<sup>7-9</sup> Higher prevalence of obesity among residents in rural areas is likely an important factor contributing to rural-urban health disparities. Research suggests that rural residents are at greater risk than urban residents for obesity-related conditions including coronary heart disease,<sup>10</sup> diabetes,<sup>10</sup> metabolic syndrome,<sup>11</sup> and certain types of cancers.<sup>12</sup> Rural residents also tend to have shorter life expectancies, higher mortality rates, and higher percentages of mortality from the five leading causes of death than their urban counterparts.<sup>13-15</sup> Addressing the higher prevalence of obesity in rural areas may have important implications in improving the disproportionately poorer health of rural residents.

### **III. Rural-urban differences in weight-related behaviors**

Rural-urban differences in obesity-related health behaviors play an important role in the higher prevalence of obesity and associated adverse health outcomes in rural areas.<sup>10,11</sup> Data from multiple studies indicate that a greater proportion of rural adults are physically inactive,<sup>3,16-18</sup> fewer rural adults engage in moderate physical activity,<sup>19</sup> and fewer rural adults meet aerobic leisure time physical activity recommendations.<sup>20</sup> Rural-urban disparities in physical activity are particularly notable in the South,<sup>16</sup> and



some evidence suggests that rural-urban disparities in physical inactivity only exist in the South.<sup>17</sup> In addition to rural-urban differences in physical activity, there are also geographic differences in dietary factors that may have implications in the higher obesity prevalence in rural areas. Compared to urban adults, rural adults consume fewer fruits and vegetables<sup>3,11,19</sup> and proportionally more calories from fat.<sup>4</sup>

While many studies provide evidence of statistically significant rural-urban differences in certain weight-related behaviors, the magnitude of these differences is often minimal.<sup>21</sup> For example, based on data from the nationwide Behavioral Risk Factor Surveillance System, the prevalence of adults who do not consume at least five daily servings of fruits and vegetables was 79 percent among rural adults compared to 76 percent in urban adults.<sup>19</sup> Based on NHANES data, the average proportion of calories from fat consumed by rural residents was 34.4 percent compared to 33.6 percent among urban residents.<sup>4</sup> In addition to these minimal differences in specific dietary behaviors, caloric intake is similar between rural and urban adults.<sup>3,4,11</sup> Evidence also indicates that associations between weight-related behaviors and obesity varies by rural-urban residence. Among older adults, physical activity has been associated with obesity among both rural and urban residents. However, fruit and vegetable consumption was associated with obesity only among urban older adults.<sup>22</sup>

Among children, evidence regarding rural-urban differences in weight-related health behaviors is largely inconsistent,<sup>23</sup> with some evidence suggesting that the prevalence of physical inactivity is higher among urban children.<sup>24</sup>

#### **IV. Social determinants of health influencing rural obesity**

Multiple socio-environmental factors underlie rural-urban differences in health behaviors that are implicated in the higher obesity prevalence in rural areas. Rural residents have reported barriers to engaging in healthy lifestyle behaviors including limited opportunities for physical activity; lack of access to fresh and affordable healthy foods, poor food quality, and increased access to unhealthy foods; and other issues including time constraints, safety concerns, and adverse weather conditions.<sup>21,25-27</sup> Furthermore, geographic isolation compounds challenges as many rural counties are food deserts,<sup>28,29</sup> and poor rural residents may lack viable transportation to access healthy foods.<sup>27</sup> Many rural residents also lack access to physical activity opportunities due to fewer safe areas for activity in close proximity to the community, long distance commutes requiring automobiles instead of healthier methods such as biking and walking, and a scarcity of sidewalks, bike lanes, and recreational spaces.

Despite evidence suggesting that many rural residents experience multiple environmental barriers to engaging in healthy weight-related behaviors, studies on the effects of environmental factors and obesity among rural residents have provided conflicting results. For example, among rural youth from 1998 to 2007, constant access



to fruit and vegetable markets increased overweight/obesity risk, constant access to candy stores decreased overweight/obesity risk, and reduced access to healthy food stores increased obesity risk.<sup>30</sup> These findings highlight the complex relationships between environmental factors and weight-related behaviors. In addition, rural areas are diverse in the extent to which their environments support or hinder weight-related behaviors, with many rural areas having environmental supports for healthy living that are similar to urban areas.<sup>31</sup>

Poverty-stricken rural areas have fewer resources to support health or infrastructure improvement. Additionally, rural families are more likely to live at or below the poverty line compared to those living in urban areas. According to the 2017 American Community Survey, the nonmetro poverty rate was 16.4 percent in 2017, compared with 12.9 percent for metro areas.<sup>32</sup> Poverty disparities are particularly notable in the South, where the poverty rate is 20.8 percent in nonmetro areas compared to 15 percent in metro areas. In 2017, 22.8 percent of rural children in the United States were poor, compared to 17.7 percent of urban children.<sup>32</sup> High rates of obesity in rural areas may be influenced by educational inequalities, as lower education of a household head is associated with an increased obesity prevalence.<sup>6</sup> Rural youth often live in households with low educational attainment and are less likely than non-rural youth to earn a bachelor's degree.<sup>33</sup> Finally, rural communities have a vast shortage of health care providers, prevention resources, and public health entities. Rural areas often receive less federal funding for programs that have been shown to alleviate some of the factors contributing to high obesity rates.<sup>34</sup>

## **V. Strategies to address rural obesity**

Several initiatives have been implemented in rural communities to improve health behaviors associated with obesity and reduce body weight. Evidence suggests that these initiatives are well received by rural residents and may produce positive effects on weight-related health behaviors.

### *Effects of changing rural environments to promote behavior change and reduce obesity*

Researchers who have tested the effects of improving the food and physical activity environment in six rural Kentucky counties observed no change in moderate or vigorous physical activity and only a small increase in fruit and vegetable consumption among rural adults.<sup>35</sup> Similarly, a trial to improve school food environments and community outreach resulted in a small increase in vegetable intake of 0.08 cups/1,000 kcal and 0.22 cups/1,000 kcal of fruits and vegetables compared to students in control schools.<sup>36</sup> There were no other differences in dietary changes between intervention and control schools. Others have noted that community and social activities such as races or walking events, kid-friendly events, and group walks may be potential strategies to encourage physical activity,<sup>37</sup> but these types of activities may not be successful without



first changing the physical environment.<sup>38</sup> Some evidence also suggests that adding trails increases walking.<sup>38</sup>

While several initiatives have been shown to improve obesity-related health behaviors, there is limited evidence to suggest that these efforts are effective in lowering body weight. Of 29 studies addressing diet-related policy and environmental changes in rural areas, less than half reported on outcomes, and one-third of the studies were conducted in tribal communities.<sup>39</sup> Among six studies in which weight outcomes were reported, weight status was reduced in only one study, and individual-level behavior change strategies were implemented in addition to policy/environmental changes.<sup>39</sup> There is also limited evidence that policy and environmental changes for physical activity in rural areas are effective in reducing obesity. Among 14 studies in which activity outcomes were reported, significant improvements in physical activity were reported in only four, and findings regarding changes in weight status were mixed.<sup>40</sup>

## *Behavioral programs*

Several behavioral obesity trials have been conducted in rural areas and were effective in reducing body weight among rural residents.<sup>41</sup> Multiple trials have been modeled after the highly effective National Diabetes Prevention Program<sup>42</sup> and relied upon U.S. Department of Agriculture Cooperative Extension Service staff and resources.<sup>43,44</sup> Others have tested the effects of delivering the diabetes prevention program to rural communities via telehealth and have reported that weight loss outcomes are similar to those of on-site programs.<sup>45</sup> Similarly, behavioral programs delivered through the internet or by DVD have been effective in successfully reducing bodyweight for rural residents.<sup>46</sup> A key factor that potentially influenced the success of these remote programs was routine contact with lay health coaches. Obesity programs delivered in rural primary care settings and churches have also been tested and shown to be effective at reducing body weight.<sup>47,48</sup> In addition to the success of programs modeled after the diabetes prevention program, rural residents who participated in a chronic disease self-management program reported increased physical activity levels, improved dietary habits, and positive perceptions regarding the program.<sup>49</sup>

## *Encouraging active living through the built environment*

Several strategies may be employed to encourage active living through the built environment in rural communities. Shared-use agreements typically occur between two separate government entities allowing for shared use of public property or facilities.<sup>50</sup> One that is common includes opening school recreation facilities during non-school hours to increase community access for physical activity.<sup>51</sup> Another strategy is ensuring rural neighborhoods are walkable through complete streets. Residents of walkable communities get an average of 35 minutes more of physical activity per week and are at lower risk of becoming obese than those in non-walkable communities.<sup>52</sup> Rails-to-Trails Conservancy is a nonprofit organization that provides resources to facilitate the



transformation of unused railroad tracks into public paths and trails for walking, biking, hiking, cross-country skiing, and more. Their goal is to create a national network of trails from former rail lines to improve opportunities for active living in rural areas.

### *Increasing access to healthy foods*

Community supported agriculture has grown in popularity as a way to increase access to healthy foods for disadvantaged populations<sup>53</sup> and has been documented to increase vegetable intake among rural residents.<sup>54</sup> Community supported agriculture can help connect rural communities with local farmers by allowing rural residents to purchase shares of produce from local farmers.

Farm-to-school initiatives provide another opportunity for local farmers to sell fresh fruits and vegetables directly to public schools. Farm-to-school empowers children and their families to make informed food choices while strengthening the local economy. USDA created a farm-to-school planning toolkit that provides questions to consider and helpful resources to reference when starting or growing a farm-to-school program.<sup>55</sup>

Mobile vending of healthy foods out of a portable vehicle has also increased in popularity. Healthy mobile markets have brought healthy foods to hard-to-reach rural communities.<sup>56</sup> These food sources may be alternatives to retail food stores and have been viewed as important food resources for low-income rural residents.<sup>26</sup>

Farmers' markets have been suggested as a potential strategy to increase access to fruits and vegetables and consequently improve fruit and vegetable intake among rural residents.<sup>57</sup> However, evidence suggests that few rural farmers' markets accept Supplemental Nutrition Assistance Program (SNAP) benefits,<sup>58</sup> and this is a substantial barrier to shopping at farmers' markets in rural areas.<sup>59</sup> Both SNAP and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) encourage farmers' markets to accept their program benefits. However, there is currently limited evidence to support the use of farmers markets as an effective strategy to reduce obesity in rural areas. Farmers' markets have use has been associated with greater fruit and vegetable consumption, but not body mass index reduction among adults living in Kentucky and North Carolina.<sup>57</sup> In another study involving adults from rural and urban areas, SNAP recipients who shopped at farmers' markets reported consuming 4.7 servings of fruits and vegetables per day compared to 3.6 servings per day among SNAP recipients who never shop at farmers' markets.<sup>59</sup> However, shopping at a farmers' market was not associated with body mass index. Additionally, establishing a rural farmers' market can be challenging due to large geographic distances and a small number of potential shoppers.

Food hubs are another opportunity to provide farmers access to otherwise inaccessible markets in rural communities to sell a diverse array of locally grown fruits and vegetables. A food hub is an organization that provides aggregation, distribution, and





marketing services to local and regional producers to enhance their ability to satisfy wholesale, retail, and institutional demands.<sup>60</sup> For rural communities, food hubs provide an opportunity for residents, local schools, hospitals, and other organizations to access fresh food.<sup>61</sup>

## *Promoting healthy eating habits and daily active living through community health engagement, support*

Safe Routes to Schools programs encourage children and adults to adopt active forms of transportation.<sup>62</sup> Walking or biking “school buses” involve parents or volunteers supervising children as they walk or bike to school. These are particularly important in rural areas where people live longer distances from schools and often do not have access to sidewalks or crosswalks to ensure safety. Community walking groups promote walking as a form of physical activity and allow residents an opportunity to engage with the community. They provide a social opportunity to promote active living with people who may otherwise forgo physical activity on a regular basis.

Community gardens provide rural communities with a source of fresh produce often hard to access in rural markets, offer opportunities to educate residents about nutrition and healthy cooking, and reconnect rural communities with locally grown foods.<sup>63,64</sup> Community kitchens are another way to provide local food producers with the capacity and space to process, store, and distribute their produce locally. Additionally, they allow rural residents not involved in the agriculture industry an opportunity to help in the handling and preparation of fresh produce to sell to local markets.

## **VI. Recommendations**

To address limited access to fresh fruits and vegetables in rural areas, we recommend incentivizing farmers to establish or participate in rural farmers’ markets and/or community supported agriculture. Further, we recommend incentivizing farmers and/or farmers’ markets and community supported agriculture to accept SNAP and WIC benefits to ensure that those experiencing the greatest need have better access to foods that can prevent and reduce obesity. Potential incentives may include monetary support, personnel support, supplies, and equipment.<sup>58</sup> Personnel support may be particularly important given that an individual applicant is responsible for completing the USDA Food and Nutrition Service application required to process SNAP benefits. Applications are submitted using a personal social security number rather than a business identification number. If the person who originally completes the application leaves the market, then a new person would need to complete the USDA Food and Nutrition Service SNAP application.

As part of the recommendation to increase access to rural farmers’ markets/community supported agriculture and accept SNAP and WIC benefits, we recommend that funding



agencies such as USDA, National Institutes of Health, and others should fund high-quality research to examine the effects of increasing access to farmers' markets and community supported agriculture on obesity. Such research is important given that few studies addressing diet-related policy and environmental changes in rural areas include weight as an outcome.<sup>39</sup>

Given that multiple obesity trials have been successful in reducing body weight among rural residents, we recommend that policymakers at the local, state, and national level allocate financial resources to establish or improve access to evidence-based weight loss programs. Such financial support may include incentives for rural hospitals, primary care clinics, or other community-based organizations to develop and implement local diabetes prevention programs for rural residents with obesity. Establishing such programs in rural communities is important given that only 15 percent of rural counties have access to diabetes prevention program sites compared to nearly 50 percent of urban counties, and the average number of sites in rural counties is 0.17 compared to 1.15 in urban counties.<sup>65</sup>

An exemplar supporting the recommendation for improving access to evidence-based weight loss programs is the Fit For Life program. This program was based on the diabetes prevention program and offered by the Trinity Hospital Twin City in rural Ohio. Multiple organizations funded the program including the US Department of Health and Human Services, the Health Resources and Services Administration, and the Office of Rural Health Policy.<sup>66</sup> On average, the Fit For Life program resulted in participants losing approximately 3 percent of their body weight, with 27 percent of participants losing 5 percent or more.

Policymakers should work with schools to encourage the implementation of comprehensive nutrition and health education, compliance with updated nutritional standards through the Healthy Hunger Free Kids Act, and promote the importance of daily physical activity in the development and health of students. Studies have demonstrated that school-based health education can positively impact the health of students, teachers, and parents. An evaluation of the Supplemental Nutrition Assistance Program Education showed that nutrition education programs can positively influence the willingness of SNAP participants to buy and eat healthy foods.<sup>67</sup> Nutrition education should be expanded to include agriculture, seasonal food production, and the benefits fresh produce can have on students' daily eating habits. Regarding physical activity, policymakers and school officials should work together to apply for rural physical education grants, support the development of curriculum that follows Centers for Disease Control and Prevention recommendations for daily physical activity, and institute minimal standards for daily or weekly activity.

Policymakers should work with communities to implement zoning laws and regulations that offer incentives to encourage the sale of healthy options, encourage community groups and leaders to access funding to increase the availability of healthy foods such



as the Federal Healthy Food Financing Initiative, and ensure production and distribution infrastructure exists to meet the growing demand for local foods. Finally, rural communities should develop task forces to address obesity prevention. By involving a variety of community actors from school administrators to business owners to health professionals, task forces can coordinate strategies to address barriers to healthy living, encourage residents to take responsibility for safeguarding community health, and focus attention on local obesity issues.

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# National Rural Health Association Policy Paper

