Food Deserts, Sustainable Food Hubs, Pre-School Aged Native American Indian Children, and Childhood Obesity

Dolores Stegelin, Clemson University
Forrest Stegelin, University of Georgia

Western Agricultural Economics Association
Monterrey, CA
June 26 – 28, 2013
Childhood Obesity Among Native Americans

- Childhood obesity is a leading public health concern that disproportionately affects low income and minority children.
  - One of seven (16%) low income, preschool aged children is obese.
  - Prevalence of obesity in low income two to four year olds has increased steadily over last 15 years, from 12% to 15% (2010 Census).

- Native American Indians and Alaska Natives are the only race or ethnic groups with increasing rates during past five years.
  - Obesity rates highest among Native American Indian or Alaska Natives (21.2%) and Hispanic (18.5%) children, and lowest among Caucasian, Asian or Pacific Islander, and African American (each at about 12%).
  - Only Hawaii and Colorado reported 10% or less of low income preschool aged children were obese; the only groups with obesity rates over 20% were Indian Tribal Organizations.
News Headlines, 06/18/13: “Obesity is a Disease”

• Research is needed to better understand the factors associated with obesity, such as SES, nutrition, physical activity patterns, heredity, environmental factors, or a disease (changes dynamics of research on obesity if a disease and not physical malady).

• Teachers and administrators in early learning settings can provide more active routines, kinesthetic learning strategies, and healthy foods and nutrition patterns, regardless.

• Native Americans, Alaska Natives, and Hispanic children are more likely to be overweight; there is a need to study these child populations.

• Also need to review resources to address childhood obesity.
Food and Nutrition Assistance Programs

• During height of 2007-2009 recession, one in four Americans, including Native Americans, received benefits from at least one of the USDA food programs:
  – Supplemental Nutrition Assistance Program (SNAP)
  – Special Supplemental Nutrition program for Women, Infants, and Children (WIC)
  – School Meals Program (breakfast and lunch)
  – Child and Adult Care Food Program

• The Native American population also benefited from the Food Distribution Program on Indian Reservations (FDPIR)
  – provides monthly supplemental food packages to low-income households living on Indian Tribal reservations or approved areas near reservations.

• USDA’s KYF2 (“Know Your Farmer, Know Your Food”) initiative, coupled with “local food” promotion and local or regional food banks, provided indirect nutrition assistance.
Food Deserts and Food Hubs

- USDA’s “food desert” focused on low access to foods, using proximity or distance of consumers to food markets as metric for evaluation – a rather negative connotation, especially in rural counties with limited choices of market centers or communities.

- USDA’s “food hub” is “a business or organization that is actively coordinating the aggregation, distribution, and marketing of source-identified locally or regionally grown food products sourced from primarily small to mid-sized producers to wholesalers, retailers, or institutional buyers, and/or consumers at a central hub.” Food hub can also act as a central facility providing knowledge and technical support to its grower community – production, food preservation, food processing, food safety – as well as serve as a direct market (seasonal).
• Access to grocery stores and the variety of foods offered in grocery stores may contribute to higher rates of obesity among certain populations, particularly when considering lower income neighborhoods.

• Some low-income neighborhoods with poverty rates exceeding 20% have been dubbed “food deserts” because there are few sources of healthy, nutritious and affordable foods, and low access to supermarkets or grocery stores.

• Rural communities, including Indian Tribal communities, may also experience the same fates of lower incomes, higher unemployment, higher poverty, lower access, and fewer food choices.

• The lack of healthy options leads, according to some researchers to poor diets and to diet-related diseases or conditions, such as obesity.
The KYF2 Initiative and Food Hubs

- **Increase market access** for local and regional producers – “buy local.”
- **Complement and add considerable value** to the current food distribution system.
- **Have significant social, economic, and environmental impacts in local communities.**
- **Make regional food hubs successful through entrepreneurial thinking and sound business practices**, coupled with a desire for social impact.

- Food hubs in Native American Indian counties are primarily seasonal direct markets of produce, either fresh, frozen, canned, or dried – farmers’ markets (typically tribal community or occasional wholesale markets serving as aggregation points).
Sustainability

• Definition of sustainability goes beyond the concern of going “green” (environmental impact); has three components: economics (benefits and costs) and profitability; societal or community well-being; and environmental (reductions in negative impacts).

• Funding of projects involving Native American Indians through the RIDGE program (Research Innovation and Development Grants in Economics). Initial RIDGE program funding with the Cherokee Tribal Council in Western North Carolina, which opened avenues to other tribal council participation.
Coincidence of presence of preschool aged Native American Indian children, childhood obesity, and low access to foods?

• Native American counties are clustered in two areas containing reservations or tribal council communities:
  – Northern High Plains (Dakotas, Montana, Wyoming)
  – Four Corners region of the Southwest
  – Many more reservations exist in counties where Native American minority population is less than 1/3 of total (San Diego county, CA, has most number of identified reservations)

• Native American counties tend to be thinly settled and far from major population centers. Only 14% of Native American counties are adjacent to a metro area, and only half contain a community of more than 2,500 people, creating non-competitiveness among food businesses.
Visual and Analytical Methodologies Employed

• **overlaying USDA-sourced atlases** (Food Environment Atlas, Food Desert Locator, Food Access Research Atlas) and US Census Bureau map of the American Indian and Alaska Native population as a percentage of county population in 2010 suggests a high visual coincidence of obesity in Native American counties recognized for food deserts and low incomes.

• **Direct correlation** of Native Indian counties to presence of childhood obesity rates greater than 20% = 78.

• **Direct correlation** of Native Indian counties to low income, low access to food = 72.
Original Food Desert Atlas – Low Income and Low Access
Nonmetro counties with high poverty, 2000

Source: Calculated by ERS using U.S. Census Bureau data.
Note: High poverty is defined as a poverty rate of 20 percent or more.
Persistent Child Poverty Counties

Persistent Child Poverty Counties, 1979-2009

Persistent child poverty counties are defined as those with at least 40 percent of children under 18 years old living in poverty for 1979, 1989, 1999, and 2009.

Applying analyses of interdependency, namely factor analysis and cluster analysis:

- Summarizes the information in the whole set of observed interdependent relationships by using some smaller sets of linear composite variates.

- Leads to a grouping of input variables that measure or is a relative indicator of the same underlying concepts or redundancies in the data → the apparent coincidence of food deserts, Native American Indian preschool aged children, and childhood obesity.
**Cluster analysis** of “attribute profile of Native American Indian food purchaser clusters”  

[** = 0.05 statistical significance, or better]

**Eating Habit Clusters**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Conscious</th>
<th>Counters</th>
<th>Planners</th>
<th>Bound</th>
<th>Goes</th>
<th>Grazers</th>
<th>Junkies</th>
<th>Foodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calorie</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anything</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepared, RTE</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At-Home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Away-From-Home</td>
<td>**</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh and Local</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Serving Size</td>
<td>**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• **Factor analysis** of “Native American Indian Tribal Community/Organization Food Environment Factor Structure”

• **Food Deserts** (items listed in descending eigenvalues [total variance])
  – Restaurants/cafes/diners (excluding fast food)
  – Grocery/dollar-genre food stores (excluding gas/convenience outlets)
  – Local foods
  – Population center > 5,000 people
  – Employment
  – Personal transit/transportation
  – Licensed preschools/day care, 4 month – 6 years
  – Consolidated school district, K – 12

• **Childhood Obesity**
  – Grocery/dollar-genre food stores
  – Licensed preschools/day care
  – Employment
  – Population center > 5,000
  – Local foods
  – Restaurants/cafes/diners
  – Personal transit/transportation
  – Consolidated school district
No definitive proof!

- With spatial migration from original “reservations” or Native Indian counties to urban or suburban locations and the restricting of direct information on the Native American and Alaska Native population to using Census Redistricting Data (Public Law 94-171) Summary Files only, direct access to data is limited and/or unavailable. Heavy reliance on RIDGE program funding for consumer behavior and spatial information of a targeted Native American population or tribal council.

- Does not deny the health concerns about childhood obesity nor the prevalence of obesity among preschool aged Native American Indian children.
Future Research Needs

• Need to inform and work with parents of low-SES children about the health issues related to obesity and overweight.

• Need for collaboration between federal and state agencies (and focused population agencies) that serve this population.

• Need to engage education and caregivers about the importance of obesity and health related issues in the early learning setting.

Thank you for your interest and attention. Any questions or comments?