

The Devastating Consequences of Unequal Food Access

The Role of Race and Income in Diabetes

HIGHLIGHTS

Common sense tells us that living in places with easy access to healthy food helps people make better choices. But now, for the first time, data link proximity to healthy food retailers with lower rates of diabetes, a debilitating, diet-related disease that shortens lives and drives up health care costs. The effect on diabetes rates is even more pronounced in US counties that have a greater-than-average percentage of people of color; this is significant because these populations are disproportionately affected by diabetes. But the solution to this health equity crisis will involve more than simply placing additional supermarkets in certain neighborhoods. Public policies should take a comprehensive approach, providing incentives to increase production and sale of healthy food, prioritizing nutrition education, and investing in innovative local programs to get healthy food to people who need it. We should rework our nation's food and agriculture policy system to emphasize the goal of improved health and well-being for all. Policies that focus on equitable food access will move us closer to this goal.

Over the past three decades, diabetes rates in the United States have nearly quadrupled. The two most prominent forms of this chronic disease are type 1 and type 2. Unlike type 1 diabetes, type 2 is diet related and highly preventable. Approximately 90 to 95 percent of diabetes cases in the United States are type 2 (CDC 2014). It is estimated that nearly 30 million Americans suffer from diabetes, with more than 8 million of them undiagnosed (CDC 2014). Diabetes plagues people of color at the highest rates (CDC 2014). Among all US racial and ethnic groups, Native Americans and Alaska Natives have the highest age-adjusted prevalence of diabetes—nearly 16 percent of adults—while African Americans and Hispanics are twice as likely as whites to have diabetes (13.2 percent and 12.9 percent, respectively, compared to 7.6 percent of whites). If recent trends continue, close to one-third of the US population could have diabetes by 2050, with some 30 percent of African Americans and 50 percent of Hispanics affected (Imperatore et al. 2012). Left untreated or poorly managed, diabetes can cause kidney damage, blindness, and poor circulation, which in turn can lead to lower-limb amputations, stroke, and other cardiovascular diseases (Whiteney and Rolfs 2012). In the United States, diabetes is the seventh-leading cause of death (CDC 2014).

Diabetes Affects Us All, But It Hits Communities of Color Hardest

In addition to experiencing higher diabetes prevalence rates than whites, people of color encounter more obstacles to preventing, managing, and treating this diet-related disease. This is in part due to populations of color having lower incomes



Hispanics and African Americans are nearly twice as likely as whites to have diabetes. Lack of access to healthy food is a key factor in this disparity.

than white populations. African Americans are nearly three times more likely than whites to live in poverty (27.3 percent compared with 9.7 percent) and Hispanics are two and a half times more likely (23.7 percent) (Kaiser Family Foundation n.d.). Lower income, combined with historical and perceived racism encountered in the health care system, makes it harder for people of color to access both healthy food and health care. Barriers to health care access—including a lack of community-based clinics, longer travel time to clinics, lack of personal transportation, and high out-of-pocket prescription drug costs—make diagnosing and managing diabetes challenging in many communities of color. These structural barriers contribute to higher mortality rates for people of color, and they are six times more likely than whites to suffer diabetes-related kidney damage. African Americans undergo lower-limb amputations more frequently than do whites (Carter, Pugh, and Monterrosa 1996). The Akimel O’odham people of southern Arizona, a Native American nation, have an amputation rate that is nearly four times greater than the rate for whites (Carter, Pugh, and Monterrosa 1996).

These health disparities have deep, still unresolved historical roots reflected in the structure of our society, which includes a food system built on unfair practices and labor exploitation of Native Americans, African Americans, and Latinos (Haynes-Maslow and Salvador 2015). Many policies

perpetuate these inequities. For example, under today’s labor laws, food service workers and farm laborers have some of the lowest-paying jobs in the United States (US Bureau of Labor Statistics 2015). Their lower incomes cause these workers to be more likely than other types of workers to face food insecurity and to rely on public assistance programs (RTI International 2014; Allegretto et al. 2013). More than half of full-time employees in fast food restaurants rely on these programs (Allegretto et al. 2013).

Diabetes and other diet-related chronic diseases are therefore only a symptom of these inequities, which cause communities of color and lower-income communities to have more restricted food choices than predominately white communities. Their choices, conditioned by availability and cost, favor foods high in sugar, salt, and fat—which increase the risk of diet-related chronic disease—rather than foods high in fiber, vitamins, and minerals, such as fruits, vegetables, and whole grains (Bell et al. 2013; Whitney and Rolfes 2012). As a result, communities of color and lower-income communities face higher rates of not only type 2 diabetes but also other chronic diseases such as obesity and heart disease (Zick et al. 2009; Morland, Wing, and Diez Roux 2002).

Although these communities bear the greatest burden of diabetes because they are more likely to be afflicted, this disease affects all Americans. With its many complications, diabetes is a costly health condition. The Centers for Disease Control and Prevention (CDC) estimate total US diabetes costs at \$245 billion annually, including \$176 billion in direct diabetes-related medical expenses and \$69 billion in reduced worker productivity in the form of absenteeism, unemployment, and early death (CDC 2014). More than 62 percent of the cost for US diabetes care in 2012 was paid by taxpayer-funded public health insurance programs such as Medicare and Medicaid (ADA 2015).

What Does It Mean to Have “Access” to Healthy Food?

What people eat is largely dependent on their access to various foods. Access has many components, including the physical environment (geographic proximity, transportation to food retailers, availability of healthy food, and quality and variety of healthy food); the economic environment (affordability of healthy food); and the sociocultural environment (relative convenience of purchasing healthy food, knowledge and skills needed to prepare healthy food, and cultural taste preferences) (Haynes-Maslow et al. 2013; Sallis, Owen, and Fisher 2008; Swinburn, Egger, and Raza 1999). Race and socioeconomic status are highly correlated with access to affordable healthy food in this country. Even if lower-income individuals have *physical* access to healthy food, they may not



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Ubiquitous fast food restaurants are an example of unhealthy food retailers that people turn to when healthier food is unavailable or difficult to access. Unhealthy food retailers are associated with increased diabetes across the study.



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Lower-income counties tend to have fewer supermarkets regardless of race or ethnicity, and predominantly African American communities have the fewest supermarkets. Easy access to the wide variety of healthy foods offered by supermarkets could lead to lower diabetes rates in both types of communities.

Communities of color and lower-income communities face higher rates of not only type 2 diabetes but also other chronic diseases such as obesity and heart disease.

have *economic* access—that is, they may not be able to afford healthy food (Haynes-Maslow et al. 2013).

Moreover, people may have both physical and economic access to healthy food, but their sociocultural environment may dissuade them from selecting and preparing healthy meals. An example is the processed food diet introduced to many Native American communities through government-run supplemental food programs. Since the 1940s, diabetes in Native American communities has gone from nearly nonexistent to epidemic—in part due to the replacement of culturally appropriate and locally produced healthier foods by foods high in fat, sugar, and salt that have been distributed through these food programs (Dillenger et al. 1999).

Analysis: The Impact of Physical Proximity to Healthy Food on Diabetes Rates

To better understand the relationship between food access and diet-related chronic disease rates in lower-income communities and communities of color, the Union of Concerned Scientists (UCS) examined one kind of access to healthy food (physical proximity) and its impact on one type of diet-related chronic disease (diabetes). We examined the most recent publicly available detailed county-level data on food retailer availability, food access, health outcomes, food insecurity, and socioeconomic composition; this data was collected by the US Department of Agriculture (USDA) in 2012 and published in its *Food Environment Atlas*. We looked specifically at the number of different kinds of food retailers per 1,000 people and its relationship to diabetes rates for various racial and economic groups using linear regression models. We defined “healthy food retailers” as grocery stores, supercenters, farmers’ markets, and specialized food stores—the latter category includes bakeries, meat and seafood markets, dairy stores, and produce markets. Although grocery stores and supercenters sell junk foods, they also reliably offer fresher and less-processed foods (Glanz et al. 2007). By contrast, “unhealthy food retailers,” which we define to include fast food restaurants and convenience stores, tend to offer a more limited selection of food, and that selection is centered on highly processed convenience items. Previous studies have categorized fast food

restaurants and convenience stores as unhealthy food retailers (Rundle et al. 2009; Wang et al. 2008).

To determine the differential consequences of physical proximity to healthy and unhealthy food on communities of color and lower-income communities, we identified four types of counties: (1) higher-than-average percentages of residents of color, (2) lower-than-average percentages of residents of color, (3) lower-income counties, and (4) higher-income counties. To identify counties with higher-than-average percentages of residents of color, we summed the percentage of African Americans, Hispanics, Asians, Native Americans or Alaska Natives, and Hawaiian or Pacific Islanders in a county. For this analysis, we categorized counties as “higher-than-average” if

the percentage of residents of color was greater than the national average of 20.1 percent. We categorized counties as “lower-income” if the median annual household income was below the all-county average (\$43,145).

In our analyses, we controlled for multiple county-level characteristics, including obesity rates; percentage of households with no car and low access to a supermarket or grocery store; percentage of the population receiving Supplemental Nutrition Assistance Program (SNAP) benefits; number of authorized SNAP retailers per 1,000 county residents; number of recreational facilities per 1,000 county residents; poverty rate; percentage of population aged 65 years or older; percentage of population under the age of 18; and the ratio of

TABLE 1. County-Level Descriptive Statistics for Study Variables, United States, 2012

	Average	Minimum	Maximum
Health Outcomes			
Adult Diabetes Rate (%)*	10.71	3.30	19.40
Adult Obesity Rate (%)*	30.55	13.10	47.90
Food Access and Insecurity			
Healthy Food Retailers per 1,000 Residents*	0.38	0.00	2.99
Unhealthy Food Retailers per 1,000 Residents**	1.18	0.00	7.24
Households, No Car, and Low Access to Retailer (%)**	3.15	0.00	68.47
SNAP Participants (%)**	14.69	6.14	21.94
SNAP-Authorized Retailers per 1,000 Residents**	0.88	0.00	6.66
Physical Activity			
Recreation and Fitness Facilities per 1,000 Residents*	0.07	0.00	0.77
Socioeconomic Characteristics			
White (%)**	78.29	2.67	99.16
Residents of Color (%)***	20.11	0.21	97.01
African American (%)**	8.75	0.00	85.44
Hispanic (%)**	8.28	0.00	95.74
Asian (%)**	1.14	0.00	43.01
American Indian or Alaska Native (%)**	1.87	0.00	94.95
Hawaiian or Pacific Islander (%)***	0.08	0.00	48.89
Median Household Income (\$)***	43,145	20,577	119,075
Poverty Rate (%)***	16.76	3.10	50.10
Child Poverty Rate (%)***	24.17	2.70	61.10
Population Age 65 or Older (%)**	15.88	3.47	43.38
Population Under Age 18 (%)**	23.42	0.00	41.57
Ratio Metropolitan to Nonmetropolitan Areas**	0.37	0.00	1.00

Notes: * Based on 3,138 counties; ** based on 3,143 counties; *** based on 3,142 counties.

TABLE 2. Communities with Higher-than-Average Percentages of Residents of Color Have Fewer Healthy Food Retailers and More Unhealthy Food Retailers

	Higher-than-Average Percentage of Residents of Color	Lower-than-Average Percentage of Residents of Color	p-Value	Lower-Income Counties	Higher-Income Counties	p-Value
Number of Counties	1,179	1,964		1,839	1,299	
Healthy Food Retailers per 1,000 Residents	0.32	0.41	0.00	0.38	0.38	0.43
Unhealthy Food Retailers per 1,000 Residents	1.21	1.16	0.00	1.22	1.12	0.00

Notes: Healthy food retailers include grocery stores, supercenters, farmers' markets, and specialty food stores. Unhealthy food retailers include convenience stores and fast food restaurants.

Access to food retailers varies by race and income. Communities with higher-than-average percentages of resident of color have less access to healthy food and greater access to unhealthy food than communities with lower-than-average percentages of residents of color. Additionally, lower-income counties have greater access to unhealthy food than higher-income counties.

a county's metropolitan to nonmetropolitan areas. Table 1 shows all the county-level indicators. (For a complete explanation of our methods, see the Technical Appendix at www.ucsusa.org/UnequalFoodAccess).

RESULTS ON THE PHYSICAL ACCESS TO FOOD RETAILERS

The *Food Environment Atlas* data show that communities of color generally have less physical proximity to healthy food (again, a proxy for access to healthy food). Counties with higher-than-average percentages of residents of color have 0.32 retailers per 1,000 people, compared to 0.41 for counties with lower-than-average percentages of residents of color. Additionally, counties with higher-than-average percentages of residents of color have greater access to unhealthy food retailers: 1.21 retailers per 1,000 people compared to 1.16 retailers. Both these differences were statistically significant. When comparing access to food by county economic composition, we found that lower-income counties and higher-income counties had similar access to healthy food. However, lower-income counties had more access to unhealthy food; the difference was statistically significant.

ANALYSES OF THE IMPACT OF FOOD ACCESS ON DIABETES RATES NATIONALLY

Our analysis shows that, across the nation, there are statistically significant correlations between access to healthy food and access to unhealthy food and diabetes rates:

- **Increased access to healthy food is associated with lower diabetes rates.** Across all counties, having an

additional healthy food retailer per 1,000 people is associated with a 0.52 percentage point decrease in a county's diabetes rate. Across all counties, adding an additional retailer per 1,000 people would translate to nearly 175,000 fewer people with diabetes.



Farmers' markets are an example of healthy food retailers that not only provide nutritious food, but often support farmers, generate local economic development, and promote community engagement.

- **Increased access to unhealthy food is associated with higher diabetes rates.** Across all counties, having an additional unhealthy food retailer per 1,000 people is associated with a 0.10 percentage point increase in a county's diabetes rate. Across all counties, an additional retailer per 1,000 people correlates with approximately 35,000 more people with diabetes.

ANALYSIS OF THE IMPACT OF FOOD ACCESS AND DIABETES RATES BY COUNTY RACIAL COMPOSITION

We found a stronger correlation between access to healthy food retailers and diabetes rates in counties with higher-than-average percentages of residents of color than in counties with lower-than-average percentages (see Figure 1):

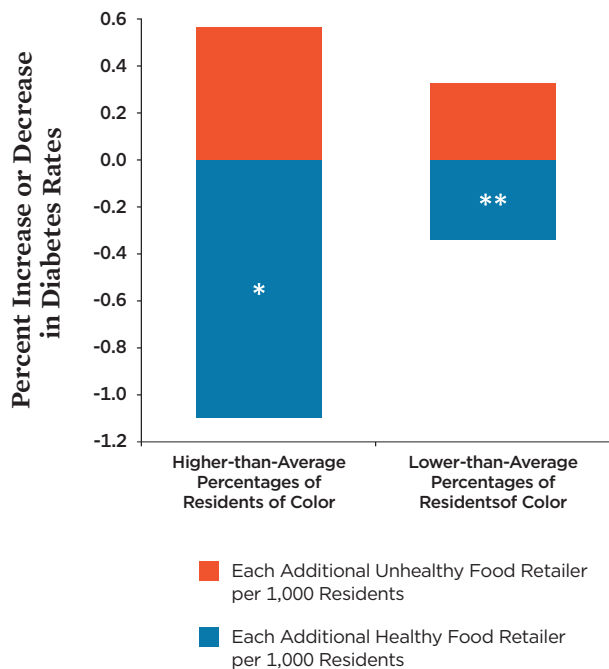
- **The impact of increased access to healthy food on diabetes rates is greater in counties with higher-than-average percentages of residents of color.** The reduction in diabetes rate correlated with one additional

healthy food retailer per 1,000 residents in counties with higher-than-average percentages of residents of color (1.10 percentage point decrease) is three times larger than in counties with lower-than-average percentages of residents of color (0.34 percentage point decrease).

When comparing the impact of unhealthy food on diabetes rates by county racial composition, we found that counties with higher-than-average percentages of residents of color were more negatively affected by access to unhealthy food than were counties with lower-than-average percentages of residents of color (see Figure 1):

- **The impact of increased access to unhealthy food on diabetes rates is greater in counties with higher-than-average percentages of residents of color.** The increase in diabetes rate associated with one additional unhealthy food retailer per 1,000 residents in counties with higher-than-average percentages of residents of color (0.56 percentage points increase) is one and a half times larger than in counties with lower-than-average percentages of residents of color (0.33 percentage points increase).

FIGURE 1. Healthy Food Retailers Decrease Diabetes Rates in Counties with Higher-than-Average Percentages of Residents of Color



Notes: * p-value <0.05; ** p-value <0.01. Healthy food retailers include grocery stores, supercenters, farmers' markets, and specialty food stores.

In counties with higher-than-average percentages of residents of color, each additional healthy food retailer has a dramatic effect on diabetes rates, much more so than in counties with lower-than-average percentages of residents of color.

ANALYSIS OF THE IMPACT OF FOOD ACCESS AND DIABETES RATES BY COUNTY ECONOMIC COMPOSITION

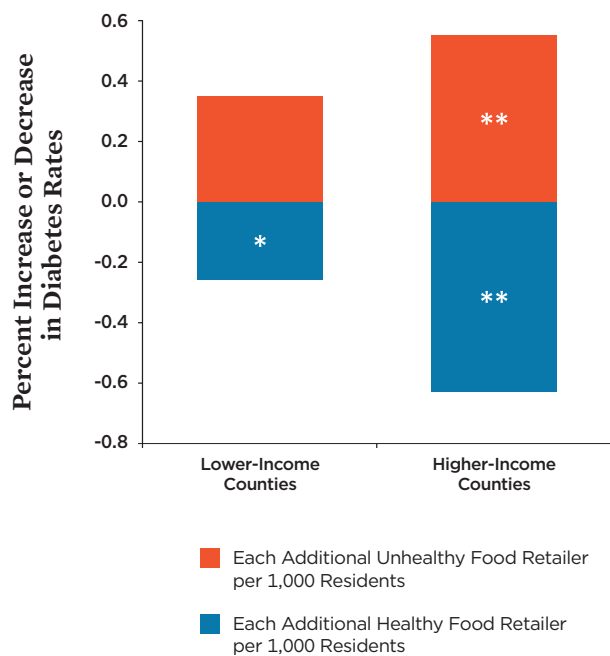
We found that lower-income counties benefit less from access to healthy food than do higher-income counties (see Figure 2):

- **Access to healthy food has a smaller impact on diabetes rates in lower-income counties.** The reduction in diabetes rate associated with each additional healthy food retailer per 1,000 residents in lower-income counties (0.26 percentage point decrease) was two and a half times smaller than in higher-income counties (0.63 percentage point decrease). Lower-income residents are less able to afford those healthier foods; we suspect that this accounts for the diminishing effect on diabetes rates.

Additionally, we found that higher-income counties were more negatively affected by increased access to unhealthy food than were lower-income counties (see Figure 2).

- **Increased access to unhealthy food has a smaller impact on diabetes rates in lower-income counties.** The increase in diabetes rate associated with each additional unhealthy food retailer per 1,000 residents in lower-income counties (0.35 percentage point increase) was one and a half times smaller than in higher-income counties (0.55 percentage point increase). The effect on diabetes rates in lower-income counties may be smaller because their residents already have greater access to unhealthy food retailers than do residents in higher-income counties.

FIGURE 2. Physical Proximity to Healthy Food Is Important, But it May Not Be Enough



Notes: * p-value <0.05; ** p-value <0.01. Healthy food retailers include grocery stores, supercenters, farmers' markets, and specialty food stores.

Additional healthy food retailers lead to a substantial decrease in diabetes rates only in higher-income counties. Lower-income counties are not as affected.

Conclusion: Physical Proximity to Healthy Food Is Important, but It May Not Be Enough

Our results reveal that physical access to healthy food retailers is associated with lower diabetes rates—and that such access can make a bigger difference for communities of color. Even though counties with higher percentages of residents of color have less access to healthy food retailers than do counties with lower percentages, they benefited more from this access in reduced diabetes rates. However, this same benefit of access to healthy food is reduced in lower-income counties compared with higher-income counties. This indicates that lack of economic access can override physical access to healthy food. Even though access to healthy food retailers in lower-income counties was similar to access in higher-income counties, the magnitude of decreased diabetes rates was much smaller for lower-income counties. This may highlight a greater issue: even when lower-income individuals have access to healthy food, they may not be able to afford it (Haynes-Maslow et al. 2013; Hendrickson, Smith, and Eikenberry 2006). The results also demonstrate

that race plays a significant role in the effects of access to healthy food.

Our results showing that people of color have less overall access to healthy food are consistent with recent research (Bower et al. 2014; Franco et al. 2008). One study found that lower-income communities had fewer supermarkets regardless of race or ethnicity, but also that at equal levels of income, predominately African American communities had the fewest supermarkets (Bower et al. 2014). While income is an important factor, the historical and continuing structural racism embedded in the food system prevents people of color, not just lower-income people, from producing, selling, and buying healthy food (Haynes-Maslow and Salvador 2015). Providing greater opportunities for producers, distributors, and retail food entrepreneurs of color could help establish more grocery stores in racially diverse counties.

Public policies should make healthy food more available, accessible, and affordable for lower-income communities and communities of color.

Discussion and Recommendations

Addressing unequal access to healthy food and the associated health impacts will require forward-looking policy action. At present, our nation's food and agriculture system operates under an array of conflicting public policies and incentives that waste taxpayer dollars by encouraging and subsidizing the wrong things—processed food ingredients that make Americans ill. This problem causes more harm in lower-income communities and communities of color. These communities are disproportionately affected by lack of access to affordable healthy food, which leads to burdensome and costly diet-related illnesses. Our analysis shows that increased access to healthy food is associated with reduced risk of chronic disease—specifically diabetes—and that this association is even stronger for people of color. As part of a comprehensive rethinking of our nation's food and agriculture system, public policies should focus on making healthy food more available, accessible, and affordable for lower-income communities and communities of color. This may reduce chronic disease, health disparities, and inequity as well as curb our nation's skyrocketing health care costs.

Access to healthy food is a multidimensional issue, and race, income, and geography play huge roles in perpetuating health disparities. Many studies of access to healthy food have focused on the physical environment, including distance to and/or density of food retailers in an area (The Food Trust 2012; IOM 2009). However, living closer to food retailers that sell healthy food may be necessary but not sufficient to improve health outcomes in lower-income communities and communities of color. The overarching issues preventing equitable access to healthy food will not be solved through piecemeal policy-making. Future federal food and agriculture policies should take a multifaceted approach to improving access to and affordability of healthy food. Their aim should be to make healthy food more affordable and widely available—particularly as compared with unhealthy processed food—for all Americans, especially lower-income communities and communities of color. In particular, UCS recommends that future federal food policies should aim to accomplish the following:

- **Bring more healthy food to the places where people of color and lower-income people live and gather.** There is no single policy solution that will accomplish this—policy makers must take an “all of the above” approach. Incentives that encourage healthy food retailers to build in underserved locations; policies and programs that create and expand food hubs and other distribution mechanisms, including innovative initiatives such as mobile food markets that address transportation challenges by bringing fresh food into neighborhoods (Abusabha, Namjoshi, and Klein 2011); and changes to nutrition assistance programs that encourage participants to purchase and consume more fruits and vegetables are a few ways to increase access. A number of federal programs, such as the USDA’s Food Insecurity Nutrition Incentive program and the Healthy Food Financing Initiative (a collaborative initiative of the USDA, US Department of the Treasury, and US Department of Health and Human Services), are already working to increase access across the

country. The next president should work with Congress to improve such programs, expand their scope, and increase their funding to promote better access to affordable healthy food in underserved communities.

- **Prioritize culturally appropriate nutrition education for children, food service personnel, and parents.** Eating habits are formed early in childhood (Mennella 2014), and in many cases schools are the best staging point for nutrition education, particularly in lower-income communities (UCS 2015). Using school meal programs to help children, parents, and food service personnel learn more about proper nutrition is a commonsense way to prime children for a lifetime of healthy eating. Recently, proposals to incorporate more nutrition education into programs, such as the USDA’s Child and Adult Care Food Program and its Farm to School Grant program, have gained traction. These types of changes are absolutely necessary to ensure that the next generation starts off on the right foot.
- **Create a comprehensive national food and farm policy that incorporates all of the above and more.** In recent years, federal policies have taken important steps toward making the US food system more healthful and equitable. But current programs are still too small and piecemeal. A more holistic and intentional policy approach is needed. The next president should commit to creating a comprehensive national food policy that would streamline and coordinate existing food, health, environmental, and economic objectives—which currently are under the purview of at least 10 federal agencies—as a first step toward transforming the nation’s food system. With this commitment, the next president can enable all Americans to access affordable, healthy food and ensure that the food and farm sectors create new jobs and pay fair wages to the millions of people they employ. For more information, visit www.ucsusa.org/plateoftheunion.

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