

CDC/National Diabetes Education Program
Food Insecurity and Its Impact on Diabetes Management:
Identifying Interventions That Make a Difference
Thursday, March 23, 2017

Transcript

SLIDE 1: NDEP Webinar Series. Food Insecurity and Its Impact on Diabetes Management: Identifying Interventions That Make a Difference

SLIDE 2: Welcome

Michelle Owens-Gary: Welcome to today's NDEP webinar, "Food Insecurity and Its Impact on Diabetes Management: Identifying Interventions That Make a Difference." My name is Michelle Owens-Gary, and I'm a behavioral scientist at the Centers for Disease Control and Prevention's Division of Diabetes Translation in Atlanta. Today, I will serve as your moderator. Food insecurity can negatively affect health outcomes. It can impact diabetes self-management, glucose control, healthcare utilization, and one's ability to cope with a chronic illness. This webinar will focus on defining food insecurity, its association with diabetes, and strategies that diabetes educators, health educators, and community health workers can use to help people with diabetes improve self-care.

SLIDE 3: Today's Presenters

Today I'm honored to present a fantastic panel of experts that literally cover the states from coast to coast, each one with plenty of expertise in food insecurity. Our first presenter is Dr. Victoria Mayer, who is an assistant professor in the Department of Population Health Science and Policy and in the Department of Medicine at the Icahn School of Medicine at Mt. Sinai. She has a medical degree from New York University and received a master's of science in health policy research from the University of Pennsylvania as a general medicine fellow. She completed her residency in internal medicine in the Einstein Montessori Program in Primary Care and Social Internal Medicine. Dr. Mayer's work focuses on improving chronic disease outcomes in vulnerable populations.

Dr. Mayer will be followed by Dr. Monideepa Becerra. Dr. Becerra is an assistant professor in the Department of Health Science and Human Ecology and coordinator of the Master of Public Health program at California State University, San Bernardino. Dr. Becerra's research emphasizes social determinants of health among vulnerable populations, with recent publications highlighting the role of food insecurity on health and behavioral outcomes. She was a U.S. Department of Veterans Affairs National Diversity Fellow in Wisconsin and is an elected board member for the National South Asian Public Health Association.

And our third and final presenter is Dr. Gary Ferguson, who recently joined the Rural Alaska Community Action Program as its chief executive officer. During the past 15 years, Dr. Ferguson has served the Alaska Tribal Health System, most recently at the Alaska Native Tribal Health Consortium. He is the co-creator of the Store Outside Your Door initiative addressing food and nutrition security for the first people of Alaska and served on the American Diabetes Association's American Indian/Alaska Native Advocacy Committee and as commissioner for the Municipality of Anchorage Health and Human Services Commission. He is also a member of the National Diabetes Education Program's American Indian/Alaska Native Stakeholder Group. We welcome you all to our webinar today.

As each of our guest presenters speak, I invite you to submit questions through the chat box. And, you'll find the chat box in the lower corner of your screen. We'll monitor all questions, and hold questions until the end, and we'll make sure to have every effort to have all of your questions answered. So, without any further ado, we'd like to invite Tori to the mic to present. Thank you, Tori.

SLIDE 4: Food Insecurity: Definitions, Measurement, And Interventions

Victoria Mayer: Good afternoon. Thank you to the NDEP for having me here today and to all of you for joining. I'm happy to be speaking with you today about definitions of food insecurity, measurement of food insecurity, and interventions in response to food insecurity in the United States.

SLIDE 5: Definitions

I'm going to start by sharing some common definitions of food security, food insecurity, and hunger. The United States Department of Agriculture defines food security as "access at all times to enough food for an active and healthy life". Food insecurity, on the other hand, is the "household-level economic and social condition of limited ability to acquire adequate food." Another commonly used definition of food insecurity is "whenever the availability of nutritionally adequate and safe food or the ability to acquire acceptable food in socially acceptable ways is limited or uncertain." Food insecurity is different from hunger. Hunger may result from food insecurity, but it is "an individual-level physiological condition," which may be defined as "the sensation caused by involuntary lack of food.

SLIDE 6: Measurement of Food Insecurity

In the U.S., the United States Department of Agriculture, or the USDA, has been publishing information about food insecurity annually since 1995. The estimates of food insecurity come from a survey that is funded by the Economic Research Service and conducted by the U.S. Census Bureau. Each year, they select a representative sample of the U.S. population and ask them to complete a survey. The survey was developed and extensively tested by experts from academia, government, and the private sector.

SLIDE 7: Measurement

The next slide shows the questions that make up the Household Food Security Survey. It's an 18-item survey, but it contains skip patterns, so if a participant answers "no" to the first few questions, he or she does not complete the entire survey, and questions 11 through 18 are asked only if there are children under 18 years old who live in the household. According to the responses, a participant is characterized as food secure, meaning they report no food-insecure conditions or only one or two food-insecure conditions, or food insecure, meaning they report three or more food-insecure conditions. Food insecurity is then further classified as low food security or very low food security, and very low food security means that one or more members of the household reduced their food

intake, and eating patterns were disrupted because of insufficient money and other resources for food.

SLIDE 8: Food Insecurity in the U.S.: 2015

This figure shows the result of the USDA survey for 2015: 12.7 percent of households in the U.S. experienced food insecurity at some point during the year, and 7 percent experienced food insecurity in the previous month. Five percent of households in the U.S. experienced very low food security during the year, and 2.9 percent during the previous month. So how do these results compare to other years in the U.S.?

SLIDE 9: Food Insecurity in the U.S.

This figure shows the USDA findings for food insecurity and very low food security from the years 1995 to 2015. The 2015 estimates did drop from 2014, and this drop was statistically significant.

SLIDE 10: Food Insecurity in the U.S.

This chart shows the percentage of households reporting different indicators of food insecurity in 2015 by food security status. So, if we look at the first indicator, “worried that food would run out,” almost all food insecure respondents worried that their food would run out, and some food secure respondents worried that food would run out. Looking at another indicator, almost 40 percent of those with low food security and 96 percent of those with very low food security reported that they cut the size of meals or skipped meals because there was not enough money for food. And finally, I want to point out that in 31 percent of households with very low food security, an adult did not eat for a whole day because there was not enough money for food.

SLIDE 11: Food Insecurity Rates are Higher in Some Groups Than Others

This next figure shows how food insecurity rates vary in different sociodemographic groups. Food insecurity rates are higher than the national average among households with children, among households with children headed by a single woman or a single man, among women and men living

alone, and among households headed by individuals who identified as non-Hispanic Black or Hispanic, and among households living below 185 percent of the federal poverty level.

SLIDE 12: Food Insecurity at the County Level

Okay, this next slide shows a map that's available from the Feeding America website and shows levels of food insecurity in the U.S. at the county level, and you can see that different areas of the country have varying levels of food insecurity. And, this interactive map allows you to learn more about food insecurity in your country or state. You can also learn on this website about the average meal cost in the county and program eligibility among individuals who are food insecure by county, state, and across the entire U.S.

SLIDE 13: Food Insecurity and Hunger: From the Perspective of Those Who Experience It

So far, I've been talking about defining and measuring food insecurity using survey tools and statistics. Now I'd like to let you know that there are a number of projects, groups, and organizations that can help everyone learn about food insecurity and hunger from the perspective of those who experience it. One of those projects is called Witnesses to Hunger, which is a research and advocacy project that involves mothers and caregivers of young children who have experienced hunger and poverty sharing their photographs and stories. You can visit the website below to learn more about this work. I also want to mention the 2012 documentary "A Place at the Table," which is a documentary on hunger in the United States. The website for this documentary has resources for community screening, social media tools, and hunger resources and fact sheets. Next, I'm going to speak about some of the responses to hunger and food insecurity in the U.S.

SLIDE 14: Responses to Food Insecurity: SNAP

We'll start with federal food and nutrition assistance programs. The Supplemental Nutrition Assistance Program, or SNAP, is the largest of these programs. SNAP was formerly known as the Food Stamp Program; it provides eligible families with funds to purchase food and aims to alleviate

hunger and improve the nutrition and health of low-income people. Most households with an income that is less than 130 percent of the federal poverty level are eligible.

SLIDE 15: Responses: SNAP in 2015

In 2015, nearly two-thirds of SNAP participants were children, elderly, or had disabilities. Forty-four percent of SNAP participants lived in households with earnings, meaning members of the household had jobs, and the average household income of SNAP participants was 59 percent of the federal poverty level.

SLIDE 16: Responses to Food Insecurity: WIC

The Special Supplemental Nutrition Program for Women, Infants, and Children, or WIC, is another large federal nutrition assistance program. This program consists of federal grants to states for supplemental food, referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and infants and children up to the age of 5. Most states also include farmers' market vouchers in their WIC program, and households are eligible that have an income below 185 percent of the federal poverty level.

SLIDE 17: Responses: WIC

This slide shows the breakdown of WIC participants in 2014, and you can see that more than half of the participants were children aged between 1 and 4.

SLIDE 18: Responses to Food Insecurity

Other federal programs that are responses to food insecurity include School Meals Program, the Summer Food Service Program, the Child and Adult Care Food Program, and food distribution through commodity programs.

SLIDE 19: Responses: Community-Based Food and Nutrition Assistance

Other responses to food insecurity include community-based food and nutrition assistance, which include emergency food providers such as food pantries, food banks, and soup kitchens. These providers are commonly private charitable providers, but some providers are supplemented by the USDA through the Emergency Food Assistance Program.

SLIDE 20: Responses: Nutritional Information

If you'd like to learn more about the nutritional information guidelines and regulations for these various programs, you can visit the websites on these slides.

SLIDE 21: Innovative Responses

Some newer innovative responses to food insecurity include incentives for SNAP participants to purchase healthy items like fruits and vegetables, and food prescription programs, where health systems prescribe healthy foods through coupons to farmers markets, Farm Share programs, or grocery stores. My own institution is currently piloting a food prescription program partnered with a Farm Share program.

SLIDE 22: Knowledge Check

And now, it's time for our poll question.

I'd like to take a moment to ask you all to participate in this poll. Please select what you think is the correct completion of the statement: "Food insecurity in individuals with diabetes has been associated with: A, hyperglycemia; B, hypoglycemia; C, both hyperglycemia and hypoglycemic episodes; and, D, none," meaning neither hyperglycemia nor hypoglycaemic episode.

SLIDE 23: Responses to Knowledge Check

Okay. Okay, and it looks like the most popular answer is C, which is "both," which is in fact the correct answer, and we'll be talking about that in just a second.

SLIDE 24: Food Insecurity and Diet

So, I'm going to talk a little bit about the evidence about how food insecurity affects a person's diet. Many research studies have examined the relationship between how much food costs and food and diet quality. These studies show that, in general, energy-dense foods like refined grains, foods with added sugars and fats are cheaper than healthier, nutrient-dense foods like vegetables, and that lower quality diets are, in general, less expensive. Other researchers have found that food insecurity is associated with lower quality diets, lower produce intake, and fewer healthy eating habits. These findings may help explain how food insecurity is associated with health.

SLIDE 25: Food Insecurity and Diabetes

Food insecurity, as many of you already know from the poll slide—several research studies have shown that food insecurity is associated with diabetes. In addition, there is a growing body of research that has found that people with diabetes who are also food insecure are at higher risk of poor glucose control and hyperglycemia, as well as at risk for hypoglycemic episodes, which can result when individuals who are taking glucose-lowering medications have periods of time when they do not have enough food.

SLIDE 26: Screening for Food Insecurity in Health Systems

The next response that I'd like to discuss with you is screening for food insecurity and health systems. The American Academy of Pediatrics now recommends screening for food insecurity, and the American Diabetes Association recommends assessing for food insecurity and other important social determinants of health. At many health systems across the country, there is an increased focus on population health and on addressing social determinants like food insecurity as a way to improve outcomes and reduce costs. Multiple health institutions across the country are instituting various screening measures.

SLIDE 27: AAP Policy Recommendations for Pediatricians: November 2015

I'm sharing with you here a further description of the American Academy of Pediatrics' recommendations from 2015 on food insecurity. So the AAP recommends utilizing a two-question screening tool, which the next slide will show you. They recommend that pediatricians familiarize themselves with referral mechanisms; that they familiarize themselves with the nutritional content of food offered in supplemental food programs; and familiarize themselves with associated vulnerabilities and risks with food-insecure households; that they educate medical students and residents; they advocate to promote access and funding of programs such as WIC and SNAP; and that they support research to optimize access to high-quality, nutritious food.

SLIDE 28: 2-Question Screen Recommended by AAP

This is the two 18-item screen recommended by the American Academy of Pediatrics. And, you may recognize these two questions, as they are from the 18-item USDA survey that I mentioned earlier. So the two statements are, "Within the past 12 months, I worried whether my food would run out before I got money to buy more." And, the second item is, "Within the past 12 months, the food I bought just didn't last and I didn't have money to get more." And, a positive answer showed a sensitivity of 97 percent and a specificity of 83 percent, compared to the 18-item USDA survey in the Hager study mentioned on the previous slide.

SLIDE 29: ADA Standards of Medical Care for Diabetes – 2017 - "Tailoring Treatment to Reduce Disparities"

These items, or these quotations, are from the ADA Standards of Medical Care for Diabetes from 2017 in the section "Tailoring Treatment to Reduce Disparities." The ADA states that "providers should assess social context, including potential food insecurity, housing stability, and financial barriers, and apply that information to treatment decisions." "Patients should be referred to local community resources when available." "Providers should recognize that food insecurity complicates diabetes management and seek local resources that can help patients and the parents

of patients with diabetes to more regularly obtain nutritious food,” and that providers should consider risk of hypoglycemia in medication decisions.

SLIDE 30: Finding Resources Near You

These next two slides provide information on hunger resources throughout the country. This first resource is from the USDA, who maintains a hotline and a website with information on emergency food resources.

SLIDE 31: Finding Resources Near You

This information is about another nationwide organization that provides information on hunger resources by phone, text, and online.

SLIDE 32: Thank You!

Thank you so much for your time today, and I will turn it over to our next speaker.

SLIDE 33: Relationship Between Food Insecurity and Health Outcomes

Monideepa Becerra: Thank you very much. My name is Monideepa Becerra from Cal State San Bernardino. And, I'm very honored to be invited by NDEP to join the group to talk about food insecurity. And, specifically, I'm talking about how food insecurity is related to health outcomes, with, of course, focus on type 2 diabetes and how that's managed.

SLIDE 34: Diagram of Relationship Between Food Insecurity and Chronic Illness

So one of the first things that I want to discuss is how food insecurities relate to chronic illnesses. And, it may seem a very complex thing, but I want to break this down because the rest of the slides really talk about how these factors are related to each other. So food insecurity, as our previous speaker has already explained the definition, can actually lead to stress. This is often because, as you may recall from the questionnaire, food insecurity is measured through “Have you reduced the portion of your meal size?”; “Have you skipped meals? Is it because of lack of money or not being

able to afford healthy food?” All of these shortages can lead to stress. But, when this stress becomes chronic, as in long term, it has been shown in the literature to lead to obesity. And, in a few slides, we'll talk about how that is the case.

When you have obesity, as you've all heard several times, it is a precursor to many other chronic illnesses, such as type 2 diabetes, heart disease, even several cancers. And, these chronic illnesses, the more a person has, the more financial hardship they're likely to have due to the need to manage personal needs, such as food, as well as the healthcare costs, whether it's paying for co-pays or visiting the emergency department or visiting a physician. All of this can lead to more poverty due to increased healthcare costs. Again, that leads to food insecurity. But, it's not just that simple because we know when we're talking about food insecurity, not eating enough food can lower your immune system. Lowering immune system can lead to chronic diseases as well as obesity. If someone is obese, they're likely to have stress due to poor body image perception, and that stress, again, can lead into financial hardship because those who have stress are likely to have mental illness. Mental illness can lead to less work hours and again, that leads to poverty. So it becomes this cycle.

SLIDE 35: Chronic Diseases

But, why is it that I'm talking about chronic disease particularly? While food insecurity in the literature has been related to some other outcomes, chronic disease is our biggest burden in the United States as well as the world itself. For example, just for the purpose of definition, chronic diseases are persistent because they last for three months or more, and that's the best way to define it. There is no way to prevent it through a vaccination, there's no cure with a medication, and they do not disappear. It is estimated that 88 percent of Americans who are 65 years or older have at least one chronic disease, with one in four having more than one chronic disease. So, that's a large percent of Americans. The world population, as well as the United States population, is getting older, so this is becoming a huge burden for our healthcare system and our public health system as well. One of the biggest things that attributed to chronic diseases is dietary behavior. Of course, smoking, physical activity, and other things are as well, but we often hear diet is a precursor—poor

diet—to having obesity and other chronic illnesses. So food insecurity, as our previous speaker has already mentioned, could potentially be related to diet.

SLIDE 36: Knowledge Check

And, before we jump into that, I want to go ahead and have a chance to have a little check right here. So the question—the knowledge check. The question says, “Food insecurity is related to which of the following?” Increased mental illness; decreased BMI, so that’s decreased body mass index; increased healthy dietary behavior; or none of the above.

SLIDE 37: Responses to Knowledge Check

Okay, so thank you. Looks like majority of participants here, we mentioned the increased mental illness. Let’s go ahead and see what we find out. But, it looks like we’re all in the same direction. I will go through the next slide and see if we can really answer this question correctly, and why I bring up mental illness when, really, we are focusing on chronic illnesses or specifically type 2 diabetes.

SLIDE 38: Food Insecurity and Diet

So, as I mentioned earlier, our speaker already mentioned diet here, so I just want to go a little bit in detail—what the literature has shown really, and I’ve listed the resources for you—is that those who are food insecure, and I’m talking specifically about adults, American adults here, are less likely to eat the recommended amount of vegetables per day. That’s the five servings. They’re also less likely to have fat avoidance behavior. What that means is cooking with items that are high in fats, those who are food insecure tend to do so. Going out to eat, if you’re food insecure, are more likely to eat food that’s high in fat. If you’re food secure on the other hand, you’re likely to cook with healthier items, likely to eat healthy when you go out.

The other major thing that has come out of diet and food security is that among veterans. We have a huge population of U.S. veterans due to the Operation Iraqi Freedom who have returned to the U.S. They are generally a younger population. And, what has happened among them, we’ve

noticed in the literature, high rates of type 2 diabetes very early on, high rates of obesity very early on. There's only been a couple of studies who actually looked into diet among veterans. And, the numbers are there for you. I'm not going to read the numbers but if you notice, it's basically saying veterans who are food insecure are more likely to eat fast food and soda; especially the soda intake goes up by 142 percent if you're food insecure. On the other hand, food intake goes down by 24 percent if you're a food-insecure veteran. Again, I bring up the U.S. veteran concern because this is a growing problem. Whenever we think about U.S. veterans, we think about mental illness and nothing really beyond. But, food insecurity is becoming a larger problem for the veterans because they're a younger population that's returning to the United States.

SLIDE 39: Food Insecurity and Obesity

So diet, as we noticed, is strongly related to food insecurity itself. And, of course, as we've heard several times in the past, poor diet can lead to obesity. And, what the literature has shown is, when you look at 12 different states across the United States, that's well over 66,000 people, if you are food insecure, you're 32 percent more likely to be obese. In a study that included 810 pregnant women, again, food insecurity was related to being severely obese before pregnancy, as well as increased weight gain during pregnancy. The problem with these two studies is predominantly they were focused on a smaller population, on just one point in time with the 12-state study. While a longitudinal study--this is where the population was followed over a period of time--they noticed the more food insecure a population was, more likely their body mass index was higher. So more food insecurity, higher BMI. Again, higher BMI is the indication of obesity and long-term chronic illnesses.

SLIDE 40: Why Obesity? Not Just Diet

So what else has to do with diet and obesity? While we know obesity is related to food insecurity, it's really not just diet. That's often the focus, is always on diet. Obesity and stress are strongly related. And, this is where the hard sciences, the biological sciences, have shown some of this evidence. What we noticed is populations who have shortage in food tend to have stress. And, this

stress, when it becomes long term, becomes chronic. Chronic stress, if it's three months or longer, can lead to biological changes in the body, where there's abdominal fat accumulation, visceral fat accumulation, cortisol release, and all of that leads to metabolic syndrome and obesity. And, as we said before, obesity is then related to actual chronic diseases.

SLIDE 41: Food Insecurity and Chronic Diseases

So, what chronic diseases has obesity shown? NHANES, which is a large-scale national study, has shown that those who are food insecure tend to have hypertension, hyperlipidemia (this is higher cholesterol), as well as lab-confirmed diabetes. This is not—this is a patient reporting that there is diabetes but as well as showing labs—exams showing that there is actual type 2 diabetes among these patients.

The same study also showed that, depending on the level of food insecurity, the chronic kidney disease rate goes up. So, if you're high food-insecurity rate, the rate of chronic kidney disease is 28.3 percent compared to somebody who reported no food insecurity, that's a lot lower at 15.7 percent. Even among children, we notice that, if a child is living in a food-insecure household, they are two times more likely to report poor or fair health compared to excellent or good. Similarly, if a child is living in a food insecure household, they are 1.4 times more likely to report asthma.

And, here's the interesting part. Why asthma? Because asthma is usually not related to food insecurity. And, this is because if you think about what food insecurity does, it lowers the ability to eat healthy meals on a regular basis, which impacts the immune system, and that negatively impacts your respiratory illness. So, in this case, asthma. So, this is why more and more we are noticing that food-insecure households, especially among children, are having higher rates of asthma as well. And, asthma and mental health are strongly related, which is why I bring up the issue of mental illness.

SLIDE 42: Prevalence (%) of Serious Psychological Distress Among Low Income Hispanics and African-Americans in California

There were two studies that were done in California among Hispanic populations and one among African-Americans that looked at serious psychological distress. Serious psychological distress is a validated instrument that's used by Kessler—Kessler is a researcher at Harvard—that measures the likelihood somebody could get a serious mental illness in the long term. And, you look at the graph, blue is for Hispanic, red is for African-American. So, among Hispanics, if you're food secure, the prevalence of serious psychological distress is 2.67 percent. But, as you become food insecure with hunger, and our previous speaker already mentioned the issue of hunger, the rate of serious psychological distress goes up to 13.4 percent. We see a very similar trend, but higher among African-Americans in California. African-Americans who are food secure reported 5.3 percent of serious psychological distress. But, when that becomes food insecure and hunger, that population reports nearly 23 percent of serious psychological distress. So, food insecurity and mental illness are strongly related.

Now, while these—both these studies are again only in California and their cross section of, as in it was done at one point in time--this shows a strong indication of what could happen at a larger scale and what future researchers could potentially look at.

So, we talked about mental illness, a little bit about diabetes, a little bit of asthma. But, what is really out there when it comes to food insecurity and diabetes?

SLIDE 43: Food Insecurity and Diabetes

So, a study was done recently looking at a systematic review. So, this is when they take all the studies published in North America and try to find a cumulative summary of what the studies have shown. And, they noticed the higher the rate of food insecurity, the higher the rate of diabetes. So, diabetes rate among those who were food insecure in the United States was 10.2 percent. But, when you compared to those who are food secure, it was 7.4 percent. And, it's not just those who were food insecure. The researchers then broke that down into different levels of food insecure. So, mild food insecurity or severe food insecurity. When looking at the diabetes rate among mild food insecurity, it was 10 percent. When you look at diabetes rate among severe food insecurity, it

went up to 16.1 percent. So again, a much larger percent of those who were food insecure, severely food insecure, had type 2 diabetes rates.

SLIDE 44: Food Insecurity and Diabetes

There were several other studies, and I will only mention a few of them, have shown similar trends. In the longitudinal study, again, this is where the population is followed over time, they've shown that, if a population is food insecure, they're 50 percent more likely to have type 2 diabetes. The patients who are food insecure are also—have a higher rate of type 2 diabetes even after accounting for everything else. For example, lifestyle factors, smoking, drinking, physical activity, income level, employment. Even after accounting for all of that, if you are food insecure, two to three times more likely to have type 2 diabetes. A similar trend was also shown with food insecurity and gestational diabetes, and we know gestational diabetes could potentially lead to type 2 diabetes in the long term.

SLIDE 45: Burden on Health Care Cost

One of the major things that we also noticed is looking at the healthcare burden of food insecure individuals. This is not just about what happens to the health outcome, but also are they spending more money because of worse health outcomes? National Health Interview Survey, which is a large-scale national study, it is not limited by the issue we have with small data where we cannot generalize to the population. Because they use Census information to make these data weighted to represent the entire United States, we can draw larger conclusions for the U.S. population.

And, one of the studies, they showed a dose-dependent relationship, which means the higher the food insecurity level, the less diabetics [people with diabetes] were to use medication. And, this was even higher among racial ethnic minorities as well as those who had more than one chronic disease. A similar study using the same database also found that one in six patients who have diabetes were also food insecure. And, if they were food insecure, they were less likely to use medication, they were reducing the medication, they were delaying it or avoiding it because it's financially hard to afford medication.

A smaller study, however, found that diabetic [people with diabetes] patients who were going to food banks, kitchens, or soup kitchens were actually one-third of them were paying for medication versus food.

SLIDE 46: Food insecurity and Health Care Utilization-Diabetes

I'll repeat the slide right here. This slide really talks about in California Health Interview Survey, which is the largest state health survey looking at emergency department utilization among diabetics [people with diabetes]. And, diabetics [people with diabetes] who were food secure, they reported a rate of ED utilization at about 7 percent. But, food-insecure diabetics [people with diabetes] actually visited the emergency department a lot higher, nearly at 13 percent, showing a much higher rate of healthcare utilization. This higher rate of healthcare utilization means higher co-pay, higher medical bill, which means we're going back to the same situation where patients are having to choose between food versus healthcare—what they need to maintain their health services.

SLIDE 47: Limitations and Strengths

Now, every study we've talked about has their own limitations and strength. Most of the ones we talked about were cross-sectional, so we cannot say food insecurity causes diabetes or causes obesity because the cross-sectional study, the one point in time study, does give, however, a strong indication. One of the problems in the literature is that the food insecurity measure is inconsistent. While our previous speaker showed what should be done, a lot of studies don't necessarily use all of that. So, we need that more stronger in the literature where people are using the USDA 12-item scale to assess food insecurity. Regardless of these limitations, however, consistently, the research shows that if you are food insecure, you're more likely to have higher healthcare burden, be it negative diseases such as chronic illnesses, or higher healthcare costs itself, both among adults as well as children.

SLIDE 47: Implications

And, our previous researcher already mentioned SNAP. And, the research does in fact show that SNAP reduces the burden of food insecurity. However, this is not true for all populations. A study in California, which has one of the largest Hispanic populations, showed that Hispanics, even when eligible, are less likely to participate in SNAP. And, that is often because of lack of knowledge, stigma, the healthcare costs, which limits their ability to want to apply to SNAP, as well as transportation. And, this is where a *promotora* model or *promotoras*, which are community health workers, can come in very handy. It has been shown to be useful in small scale and Mexico-Texas border, as well in small parts of California, where community-based resources that are promoted by community health workers or *promotoras* can reach that population that are stigmatized by participating in SNAP. This has also shown some potential with the veteran population but hasn't been pilot-tested in a large scale, where community health workers can reach the veteran population and marginalized population to make sure they're registering for SNAP or even if they're reducing the stigma and addressing transportation.

And, before I give it to my next speaker, our campus right now at California State University San Bernardino, we're doing a very similar strategy because we have a 70 percent high first generation college students and food insecurity is extremely high in our population. And, what we've found is there's a significant stigma with SNAP. So, a peer-to-peer education program is actually showing success, and we are hoping a similar strategy can be used more large scale with the Latino population as well as the veteran population. Having said that, I will go ahead and lead on to our next speaker. Thank you.

SLIDE 49: Bright Spots in Addressing Nutrition Insecurity Among America's Indigenous Population

Gary Ferguson: Good afternoon, this is Gary Ferguson and I'm really happy to speak today in our Unangam Tunuu or Aleut language, [Aleut 36.10-36.13]. I'm really honored to speak today and share about bright spots in addressing nutrition insecurity among our indigenous population or first people.

SLIDE 50: Dr. Gary Ferguson

And, just a little bit about myself. I'm from the Aleutian region, the Shumagin Islands in the community of Sand Point and had the privilege and honor of growing up close to the beach and close to a very vital food system. So, I grew up hunting and fishing and gathering food and feel really deeply grateful to my grandparents and my family for showing me how to collect plants and live off the land. And, it's been a lifelong pursuit to help keep our next generations connected to our land and our resources and preserving those resources for future generations.

SLIDE 51: 1933 Dr. Weston Price Travelled to Remote Alaskan Villages in the YK Delta

I'm going to start with just a little bit about our Alaska Native people and some of the research that's been done looking at diets and food security. And, one of the dentists, Dr. Weston Price, travelled in the 1930s to our Alaska Native villages primarily in the Yukon-Kuskokwim Delta, where he noted that our people are "examples of physical excellence and dental perfection that has seldom been excelled by any race in the past or present." He talked about our "strong rugged babies."

SLIDE 52: 1st Generation of Children Born After Adoption of 'Store Grub'

And, he also noted some very interesting things that those who ate from the store—so we had a lot of colonization, we had the fur trade, we had a lot of resources that were being extracted, and so folks came in to the YK Delta for a variety of reasons. And, so they set up a ship store where folks could buy out of the store and buy flour and, you know, processed foods. And, what he noticed was the first generation of children born after the adoption of this Western food had some very interesting things happening in their mouth. They had dental arch deformities, they had crooked teeth and they had a changed facial form, in addition to dental caries. And, he noted we had few problems more urgent or more challenging than reversing these trends.

SLIDE 53: Helping Ourselves to Health: Addressing Factors that Contribute to Obesity Among Alaska Native People

And, we had a really wonderful opportunity to work with six Yukon-Kuskokwim Delta communities in collaboration with the Yukon-Kuskokwim Health Corporation and the tribes. And Desiree, Nell Jackson, Tim Gilbert, and Jennifer Johnson was one of the early folks who helped get this project started. Shout outs to them.

SLIDE 54: Dietary Patterns and Nutritional Adequacy - Rural Yup'ik Women in Western Alaska

But, we looked at—looking at obesity and we looked at the changing diet in the YK Delta, which was really compelling when we looked at majority of women—and it was primarily women in the study, because the study was on the folks who actually provided the foods to the homes. And, majority fell below the recommendations for fiber, vitamin D, vitamin E, calcium. And, when we were looking at store-bought foods, sweetened beverages and pop were the main contributors to energy, carbohydrate, and sugar intake. And, what was really interesting in the study was traditional foods, even though they were a small part of the diet, provided a huge amount of the nutrition: 34 percent of protein, 27 percent of iron, a good chunk of vitamin A if we're, you know, thinking about immune system and ability to be vital and healthy, zinc, and it was low in carbohydrates and the small percentage of the overall calories for energy.

SLIDE 55: Knowledge Check

And, I'm going to move to a poll. And, the poll is, "Currently, what percentage of Alaska's food is imported?" Because this is going to be important in the rest of the presentation as we look at food security.

And, it's very interesting. I'm going to compare it to in the 1950s, so things have dramatically changed.

SLIDE 56: Responses to Knowledge Check

And so, the biggest vote was 70 percent and you're close, actually 95 percent of our food is currently imported from outside, which makes us very vulnerable in times of disasters, and we've had periods of time when there's been things going on in the Lower 48, earthquake or a natural

disaster, where our food system has been severely disrupted. And, many of our cities are only able to have a 2-week food supply, if that.

SLIDE 57: Public Health Nutrition

So, definitely, the importance of having a connection to how to hunt, fish, gather, and grow your own food, and the ability to have more of a local food system and a more vibrant food system, which I'll talk more about. I've been involved with the Alaska Food Policy Council and some of our work to make sure we grow our local food system.

But, I first want to talk a little bit more about the changes in our Alaska Native diets, and when we look at the shift to Western food, in which often increases our food insecurity when you're just going to the local store and counting on them to have the food that you need, which is often more processed in our villages and in our rural communities. And what's been done, a study—a recent study looking at the decline in vitamin D levels since the 1960s that are present with our Alaska Native women. This is a study that Alaska Native Medical Center, colleagues in the CDC Arctic Investigation, and our Yukon-Kuskokwim Health Corporation colleagues conducted and they found that there was a direct correlation between a decreased marine food intake or, you know, traditional foods in vitamin D levels and there's been more research that now has looked at dental caries in pregnant women and their children. So, children born from mothers who have lower vitamin D levels tend to have higher prevalence of dental caries and a host of other risk factors. So, when you look at the shift to a more Western diet and with it, often, food insecurity, you see a host of chronic disease trends.

SLIDE 58: 136% Increase in Diabetes in Alaska Native People

And, diabetes is among them, of course, and that's already been elaborated on by our former speakers about the connection between diabetes and food insecurity and also shifts in diet. When you look at a changing diet from a more traditional diet to a more Western diet, you see trends, and we know that stress and that was a big component. I just want to highlight that it isn't just always about the food. It's also about the stress. In the native community, there's a big push to understand

and help alleviate the trauma that's connected with historical trauma and helping people to address inter-generational trauma, which is connected also to chronic disease, including diabetes.

SLIDE 59: Congenital Sucrase-isomaltase Deficiency (CSID)

But, our diets have shifted, and some of the research has looked at some of our genetic variance that actually show that, if we eat a traditional diet, we don't suffer, and in this case, the congenital sucrase-isomaltase deficiency, which, this is an article from our Canadian Inuit, which are relatives from the northernmost part of our state as well, our Iñupiat population, our Inuit population, and the fact that upwards to 10 percent of that population have this genetic variant where we don't tolerate sugar or greens or carbohydrates—refined carbohydrates well.

And so, if you eat a more traditional diet, you actually don't suffer from this disease like you would as an infant, failure to thrive, a host of issues connected to disease. If you eat sugar, there is an enzyme you can take, but it doesn't fully address the root cause, which is you're hardwired for a traditional diet versus the Western diet.

SLIDE 60: CPT1A Arctic Variant

And, the CPT1A Arctic variant also is one that is connected, and we're doing more research looking at its connection to health of our Alaska Native people. This is the fatty acid oxidation process, a genetic variant that is a wild type. So, it's very common in our population, especially our Yupik and Iñupiat population, and the fact that connections to diet and early childhood nutrition, there's more research looking at that, but this is definitely again pointing to the fact that our changing diets, based upon our traditional diet and the impact of western diets, are greatly affecting our people.

SLIDE 61: Lower Prevalence of Impaired Glucose Tolerance and Diabetes Associated With Daily Seal Oil or Salmon Consumption among Alaska Natives

With traditional diets, we have the knowledge that, when you eat a traditional diet, you have less prevalence of impaired glucose tolerance, prediabetes, and diabetes. In this case, this is a study in Norton Sound region called the GOCADAN study that looked at seal oil and salmon consumption

and its effect on diet, whereas if you ate a traditional diet that had salmon and seal oil, that you had less prediabetes and diabetes and cardiovascular disease as well.

SLIDE 62: “Let foods be your medicine” —Hippocrates

And, you know, looking at the roots of our medicine, Hippocrates, considered the father of Western medicine, said some really important things that I think we need to remember as we think of treating our next generation and reducing our prevalence of chronic disease, and “let food be your medicine. Let your medicine be your food.”

SLIDE 63: Maslow’s Hierarchy of Needs (Informed by Blackfoot Nation (ALTA))

And, when we look at Maslow’s hierarchy, and this is where Maslow actually studied with the Blackfoot Nation to get his—some of his studies and thoughts, and the Blackfoot Nation takes it to a whole other level where—when you think of food and addressing some of the basic needs of our people, that it’s not just about self-actualization, but it’s about the cultural perpetuity. It’s the impact on the future of your society. Your culture is definitely connected to the roots around food and food systems and preserving your local food, your traditional foods, the way that you’ve hunted, fished, gathered your food helps your culture for generations. And, that’s a really important part as we look at some of the issues in Alaska.

SLIDE 64: 2014 AFN Convention Resolutions

Of course, we have the Alaska Federation of Natives Convention each year, where we talk about policy and bring all of our tribal leaders together, and there’s been a huge push around subsistence and having rights to our own food and self-governance so that we can preserve our local food systems and make sure that there is a balance with resource development and making sure that our foods are available for our next generation. And, it’s all part of our self-determination.

SLIDE 65: Prenatal and Postnatal Flavor Learning by Human Infants

And, when we think of the impact of the foods that we eat on our next generation, there's a lot that shows that the foods that our infants eat, and in fact maybe what mom eats during pregnancy, will greatly influence your food preferences for life, and I think it's a really important part. What we eat—and our elders have told us for generations that what you eat greatly influences the next generation and their food preferences and we can all think of our comfort foods, right?

So, of course, all food can be good food, but if mom eats a bunch of food that is Western, then, you know, we're trying to re-integrate traditional foods, well, you might not crave them if they're not your first foods, and of course, breastfeeding being a big part of your first foods, right?

SLIDE 66: Traditional Foods Infant Feeding

And, that has been a big push in Alaska to look at, you know, what can we do to address traditional foods. And in this case, just a quick story, I was in Barrow for the Nalukataq and Patti was feeding her boy, Connor, here, was going on a year old. And mikiak, which is a fermented whale product, very high in omega-3 fatty acids and iron, so addressing some of the issues with nutrition and also giving her boy a taste for traditional foods. And, I followed her over the last several years and her boys are growing up very healthy.

SLIDE 67: Traditional Food Guide

Traditional food has been a big push in Alaska Native Tribal Health Consortium and the work that I used to work with them and, of course, the colleagues were doing some great work around traditional foods.

SLIDE 68: Flower

And, not just for cancer survivors, but now, for all Alaska Native people, how to understand the nutrition value of these foods and the fact that they're often more nutrient dense than foods that we would import.

SLIDE 69: Fireweed

And, here's one of our traditional foods, fireweed, which grows across our lands and of course across our country, and gathering the roots in the spring, very rich. We call them wild asparagus.

SLIDE 70: Fireweed Nutrition Information

Lightly steamed, they taste like asparagus, and they're incredibly nutrient dense and think back to the Yukon-Kuskokwim study where the vitamin A was low. One cup of these greens more than meets your needs for the day in vitamin A and of course, vitamin C and fiber.

SLIDE 71: Iron

And, when we look at traditional foods, here's a comparison of one serving of seal, as far as iron content, is equal to two servings of caribou or reindeer. It will take you six hamburgers to equate to that one serving of seal for iron...

SLIDE 72: Hotdogs

...and 56 hotdogs to equate to that one serving of seal. So, you know, our traditional foods are incredibly nutrient dense, and preserving our knowledge of how to hunt, fish, gather, and grow our own food, as well as making sure that these foods remain safe in the environments, are a big priority in Alaska.

SLIDE 73: Berries

Our berries of course are very rich and nutrient dense...

SLIDE 74: Comparison of Berries

...and compared to the cultivated blueberries in the Lower 48. These are ORAC values, antioxidant value. When we look at our wild blueberries, you're talking about three to four times as high to our blueberries, highbush cranberries, lingonberries. So, very nutrient dense and high in antioxidants. And, the importance of teaching people and encouraging people to be connected to their food system is really vital and important.

SLIDE 75: Plants That We Eat

And, here's a lot of really great resources. This is just one of the many resources, Anore Jones in the book, "The Plants That We Eat," a beautiful portrayal of traditions, including how to ferment greens, which is another really important part to look at the microbiome and the health of our people as well.

SLIDE 76: Delia Stone

And, here we are with elder Delia Stone of Point Hope collecting curled dock or the sour dock greens and the early summer delicious greens, very nutrient dense, again, high in vitamin A, vitamin C, and trace minerals.

SLIDE 77: Greens

Very rich source of nutrition and vital part of the landscape.

SLIDE 78: Decolonizing Healthcare

Now, I'd like to talk about decolonizing healthcare, where we look at food and food as medicine. It's a really important concept for our traditional peoples, and it's such a rich way that we're decolonizing our healthcare and our food systems, and there's a lot that has been highlighted already.

SLIDE 79: Traditional Foods in Native America

I just want to draw our attention to CDC's work that has already been highlighted around traditional foods across America. And, in our native communities, there's some amazing resources that have been highlighting some of these best practices in local food systems and traditional foods.

SLIDE 80: YouTube: ANTHCStoreOutside

And one of them, The Store Outside Your Door, which I've been a part of since 2006, which is a— this is our YouTube channel, where you can watch a very short video on how to hunt, fish, gather, and grow your own food. And we connect it to culture, language, and elders, and youth. There's a lot of components that we look at, sharing this knowledge with our next generation and preserving this knowledge. And, since then, some of the elders we worked with have already passed. So, we're feeling very blessed to have captured the wisdom that they share with us.

SLIDE 81: Traditional Foods Programs and Map

And also, a part of the CDC Native Diabetes Wellness Program, there's many programs across the nation that have been highlighted that you can go online and learn more about these programs, too; in Alaska, Aleutian Pribilof Islands and Southeast Alaska Regional Health Consortium.

SLIDE 82: Aleutian Pribilof Islands Association Traditional Foods Program

And, just drawing your attention to APIA. This is my home region, and I got to work with Sue Unger and the elders and all of the folks at Aleutian Pribilof Islands Association...

SLIDE 83: Qaqamiigux: Traditional Foods and Recipes from the Aleutian and Pribilof Islands

...to help with this book that was a huge labor of love, "Qaqamiigux," which is our traditional foods and recipes from our islands and an incredible resource for our people. And, also to share with other regions—our traditions and things that we can do to keep our next generation connected to our local food system and knowing how to live off the land.

SLIDE 84: Food Is Our Medicine: Healthy First Nations

And, we're so fortunate to have a vital food system in Alaska that we can grow and grow our knowledge about. And, you know, shout out to other programs, Food Is Our Medicine, Seneca Nation, amazing programs, amazing resources that they're developing. And, these are some best practices across Indian country that there's a lot going on and these are amazing programs that are growing people's connections to their local food system and preventing chronic disease through nutrition.

SLIDE 85: Native Foodways Magazine

The Tohono O'odham and the Native Foodways Magazine; a great resource highlighting traditional local food systems, cultural ways and practices, preserving this knowledge. And, you know, that's a resource that you can sign up for and get that magazine and there's the online resources as well.

SLIDE 86: The Muckleshoot Tribe is Spreading Traditional Food Through Schools

And, I want to do a shout out to Valerie Segrest and Muckleshoot Nation and the work they're doing, and spreading traditional food through schools, training for cooks who provide food to their tribal members. I had the honor of working with Northwest Indian College, and we had Elise Krohn, Elizabeth Campbell, and others at Northwest Indian College, and Valerie Segrest. Amazing work that they've done over the years, preserving knowledge around northwest coastal tribes and the ability to understand the traditional and local foods and, you know, how to be more connected to your local food system.

SLIDE 87: Seeds of Native Health

And, one more highlight that I would really encourage everyone to attend, who can, as well as there's online resources, this is the Seeds of Native Health. This is an amazing program that started last year. It's going to be an annual conference at least for the next while. The group there, Shakopee Nation and the work that they're doing, it's amazing to look at ways that we're integrating traditional foods both from a research perspective, from an education institution perspective and

our tribal colleges. It's an amazing resource, and I want to do a great shout out to them and really about eliminating our food deserts across the nation.

SLIDE 89: Statistics From Seeds of Native Health

And, just in closing, a couple of comments about overweight or obese. We've got issues in our nation, of course, that have already been highlighted. The fact that we've got things related to food insecurity and stress, historical trauma; type 2 diabetes is a big deal in our nations, and when we look at poverty and the connection to poverty, it's directly connected. And we know the social, economic determinants of health are an area that we need to continue to work on in collaboration with our tribes.

SLIDE 90: "The doctor of the future..."

A couple of quotes to finish my presentation. "The doctor of the future will give no medicine but will interest his patients in the care of the human frame, in diet and in the cause and prevention of disease." A very wise man and a very wise quote.

SLIDE 91: Salad with Traditional Foods

And, our traditional foods are amazing, this is a salad we've made out in Akutan in the Aleutians. We've got a base of romaine lettuce that came from the store, but the rest of it is all—there's some carrots in there—but the rest is all locally harvested greens and flowers that are edible, and berries. So, there's a lot we can do to celebrate our local food system and help our next generation be connected to our local food system.

SLIDE 92: "We are free to be who we are..."

And, I'll close with a quote. "We are free to be who we are—to create our own life out of our past and out of the present. We are our ancestors. When we heal ourselves, we also heal our ancestors—our grandmothers, our grandfathers, and our children. When we heal ourselves, we heal Mother Earth." This is a quote from Doctor Rita Blumenstein, who is one of my mentors and

one of our esteemed elders, traditional healers, who is a part of reminding us of the importance of our foods, our traditional medicines, and keeping those alive. And, the fact that that's going to be a future part of our healing, that, in order to heal our next generation, which we've got issues related to epi genetics, a host of other issues; the ways that we're going to protect our next generation from chronic disease. What she talks about is it starts with us, we heal ourselves and we heal our next generations. So, I am going to close there, and thank you so much, I'm honored to present. Thanks to our NDEP colleagues for inviting me to present today.

SLIDE 93: Q&A

Michelle Owens-Gary: Thank you, Gary, and thank you to Tori and Moni as well for all of your wonderful, very informative presentations. So, we have several questions that you all posted during the presentation, so we'll go ahead and look at some of those questions and have the presenters respond.

Michelle Owens-Gary: "Can you provide more information on the food prescription program? What qualifies a patient for a food prescription? Is it a diagnosis or is it their income?"

Victoria Mayer: So, in the program that we are piloting right now at our health institution, the eligibility criteria include people with diabetes and children who are overweight or obese, and either struggle with food insecurity or are receiving SNAP or WIC. However, this study is currently in the piloting stage and the feasibility stage, but as we move ahead in our work, I look forward to disseminating our findings, and I know that institutions at other locations around the country are also trying food prescription programs, which essentially subsidize the purchase of healthy foods.

Michelle Owens-Gary: Thank you, Tori. There's another question for you, and this question is about the VA homebound veterans; it's related to the Meals on Wheels program: "Given that there is a chance for a budget cut in the future, do you have any innovative ideas for the future that can help serve these people who may lose their primary source for balanced meals?"

Victoria Mayer: This is for me, and I also would encourage Dr. Becerra to answer also because I know she had mentioned some work with veterans.

Monideepa Becerra: Absolutely, yes.

Victoria Mayer: This is a very important question about policy changes. I think at this time it's important to advocate for the rights of people in the United States, and to try and protect programs that help people to afford what they need in order to remain healthy.

Monideepa Becerra: Yes, that's absolutely correct, and one of the other things is, with the farm bill, which provides the finances needed for SNAP. It's up for renewal in 2018, so it's absolutely a valid concern with the potential budget cuts that maybe it will not be renewed. What we've seen in a lot of cases, like Meals on Wheels or other programs, not just among veterans but among others, is this is when a lot of philanthropic contributions come up. That's what we're noticing when it comes to repressive health as well, where lots of philanthropic contributions are happening when there's a budget cut. So, with public health efforts, going for those private donations early on, I think it would be a very good pre-emptive measure to ensure the finances are there. And, having that advocacy that Dr. Victoria Mayer already mentioned, having that advocacy from the farm bill that's up for renewal in 2018, would be vital to make sure these resources actually exist.

Michelle Owens-Gary: Great, thank you. Also, Moni, if you can answer the next question: "Do you think food insecurity may be under-diagnosed or under-identified because people don't want to be seen as a bad parent?"

Monideepa Becerra: Absolutely. This is where we have that concept of social desirability, where you don't want to report. This is the problem with any survey, is when you're asking these questions there is that bias, because people may not report things because if you have a child who's ill, you may perceive it's because of the lack of food. Whether it's true or not is a different story, but people are less likely to report. The interesting part is, anything like this, when it comes to a sensitive topic tends to be under-reported. But, even with the under-reporting, we're looking at really high rates in the United States, so imagine what it would be if everybody actually reported correctly. So, I think

it is under-reported but even the under reporting is showing a huge burden. But, it's a valid point, it's most likely to be under-reported.

Michelle Owens-Gary: Another question, "Is there a link available to download the pamphlet on the traditional food guide?" The traditional food guide.

Gary Ferguson: Yes, it's actually, it's a purchase because it helps support the guide, and I will post a link to connect in with the Alaska Tribal Health Consortium. It's also on Amazon, you can get a great price if you want to use it for your programs or learn more about it.

Michelle Owens-Gary: And Gary, can you explain again what is ORAC?

Gary Ferguson: ORAC value is a measurement of antioxidants. So, when you think of berries right now, blueberries are great for us, cardiovascular, there's been some great studies showing reduced cardiovascular disease for woman who regularly consume blueberries. That's a store-bought blueberries study. So, our blueberries in Alaska—in the north, the harsher the environment, the more berries produce these antioxidants that actually are protective for us as well. So, the ORAC value is a measurement of those antioxidants that show that wild blueberries exposed in a harsh environment actually produce more of the antioxidant, so they are especially good for you.

Michelle Owens-Gary: And Gary, there's another question for you: "Have studies been done taking non-native people and having them eat a traditional Native American diet? What health changes occur? Are they similar to the Native Americans?"

Gary Ferguson: That is very interesting, and I, to be honest, don't know of a study with our Native American or Alaska Native diets, but there is research. University of Pittsburgh did a study with African diets and African American diets, where you switch them, it was related to the changes to the microbiome, so traditional diet vs. a processed diet. Fascinating. That's Dr. Stephen O'Keefe was the one who did that. Because we've been also talking about studying and working with him on the changes to the microbiome and its relation to colorectal cancer and also other diseases connected

to the microbiome. So, there are some limited studies out there, but not one with Alaska Native or American Indians that I know of, yet.

Michelle Owens-Gary: Okay. And Gary, I'm going to combine two questions into one: "What causes the 95 percent of food imports in Alaska, and why isn't there a greater push toward growing and gathering and fishing and having more traditional foods available?"

Gary Ferguson: So, there is a movement, and we're working very closely with the Alaska Food Policy Council, who hosts an annual conference on hunt-fish-gather. Right now Chugach, which is one of our regions, their resource commission is hosting a conference on food security and how to hunt, fish, gather, grow your own food. There's a big push for it. In the 1950s we had about 50 percent or a little bit more than 50 percent of our food produced locally in Alaska. Due to a variety of conditions, farming and lack of incentives for farming, buying more outside food, buying less local. So, for a variety of reasons we've become very dependent. There is a big push, and I'm hoping to see that number change over time, and I feel like there's been a concentrated effort to support more local farms, even in Western Alaska and the Yukon-Kuskokwim Delta. Tim Myer has a big farm where they produce for the Bethel area and actually export greens. Barrow has microgreens and a vertical harvest project that's across the state. We've got more going on. And nationwide, it's definitely, I think of White Mountain Apache, I think of others who are doing some really great work around farming and having tribes be connected to growing their own food and growing their own culturally connected food, which is the food of our ancestors. I would say that the trend is changing, but it's one that we've become very dependent and we have a lot of work to do.

Michelle Owens-Gary: This question is for anyone. "How does food insecurity play a part in health equity?"

Monideepa Becerra: I can address that a little, but please anyone can feel free to join in. The thing with health equity is, again when we talked about obesity and other chronic illnesses, all those contribute to it. So, I think food insecurities actually could be considered a measure of health equity, because health equity is ensuring that everybody has similar outcomes, not necessarily beginning. So, food insecurities, when a population is food insecure vs. another, that can often be considered measure of the social determinants of health, which is part of health equity. So food-insecure

individuals, long term are not living enough, long term are having more rates of obesity, type 2 diabetes, poorer diets. All of those are overall is what is contributing to the lack of health equity, or therefore health disparity, with most populations.

Michelle Owens-Gary: And Tori, did you want to respond as well?

Victoria Mayer: Yeah, I agree with what Moni said, and I would just also say that in order to achieve health equity, it's very important to address factors beyond the medical setting, and medications and medical care. Food insecurity is an example of the way that the socioeconomic situation impacts health, and how it's important to have a broader perspective when working to promote health equity.

Michelle Owens-Gary: Great, and Gary did you have a response?

Gary Ferguson: So, I would say, especially as it relates to our indigenous populations, a lot of our indigenous populations have a history of being repressed. From a health equity perspective, there's stories even into the 1960s and 1970s in South East Alaska, signs saying "No Indians or dogs allowed." So, when you think of access to healthy foods and also the issues related to devaluation of your own food, like native foods or traditional foods were less than. So, from a health equity perspective, when we think of disparities in our populations, there's a history of historical trauma and repressed populations that of course create greater stress and create a whole host of issues, but it's definitely a health equity issue that is currently being addressed through local self-determination—it's a new era for Indian country.

And again, I tend to focus on the bright spots, I think we're making gains, but we still have a ways to go, because very huge disparities in type 2 diabetes and food insecurity from indigenous people and other minority populations in the United States.

Michelle Owens-Gary: Great, thank you, Gary. And there's another question: "Do you have any resources available for how stress contributes to obesity? Moni, can you respond to that?"

Monideepa Becerra: Yes, absolutely. One of the things with stress is chronic stress, this is not you're stressed out for a day because somebody has an exam. This is looking at three months or more

stress, long-term chronic stress. What it does is it releases cortisol, which then impacts your hormones, impacts your metabolic system, increases your blood pressure, your cholesterol, your blood glucose level; it also leads to abdominal fat accumulation. So, all of this leading to obesity which then—and somebody I actually noticed asked a question about asthma as well, and asthma and obesity are related because of the weight gain. So, all of that cumulatively then leads to those chronic illnesses where obesity serves as a clinical risk factor for. So, it's often a cortisol release early on, and then the adipose tissue builds up in the abdominal area often are strongly related to having that low food quality or unhealthy eating associated with food insecurity.

Michelle Owens-Gary: Thank you, Moni, and this is a question for anyone to respond to: “If people need to go to food banks, how can we make sure that they get appropriate and adequate protein in their diet (food banks don't usually give cheese or eggs)?”

Victoria Mayer: So, I think that certainly being aware of the protein content and the nutritional content of foods provided by food banks is an important part of recommending particular facilities to individuals who you're interacting with. I know that a lot of food pantries around the country have been working on making sure the food they provide are not just adequate from a calorie perspective but also healthy.

Michelle Owens-Gary: Okay, thank you. And we have time for one last question and that is: “How do we promote healthy eating habits in food deserts?”

Monideepa Becerra: I just wanted to add a quick resource that might be useful, and definitely Gary please follow up on that. One of the things that we've noticed where we live, because we're in San Bernardino, which is one of the worst food desert areas; we have a high Latino population, high immigrant population, high non-English speakers. So, a lot of that has contributed to having that lower healthy eating behaviors. However, we found, and this kind of ties in with the protein question, is that a lot of times meat and eggs can be more expensive, however beans and legumes are not, and a lot of beans and legumes tend to be high in protein. So, what we've noticed in a small scale on our campus that's worked with our population is promoting those instead of more expensive

resources for proteins and healthier options as a way to eat healthier, even if we live in a food desert, legumes and beans are more readily available.

Michelle Owens-Gary: Great, thank you, Moni. And, Gary, did you have a response for that?

Gary Ferguson: Yeah, I would say that reframing food deserts and really working on developing your own local food systems, getting involved with your local food policy council to encourage folks to grow their own food. Sometimes it's a perceived food desert, like in Alaska and some other areas, where there are local food systems that folks just don't know how to access or need regulatory or policies changed so that folks can be more connected to their food system. There is a national movement towards addressing food deserts in ways that empower people to be more connected and grow their own food, and I feel like that's an area that we all need to get behind and model and practice. And, even in some of the more very difficult food deserts, you can have some very urban, very deep urban populations, you can do some really cool local food projects, and I think there's some really great best practices in doing so. Thank you.

SLIDE 94: Continuing Education

SLIDE 95: Disclosure Statement

SLIDE 96: Visit NDEP Website

Michelle Owens-Gary: Great, thank you all for the questions, and also thank you to the presenters for your answers. We invite everyone to please visit our NDEP website. So, you may see on the screen now our newly designed website, it's www.cdc.gov/diabetes/NDEP. And, we also remind you to check out the many resources that we have, which can help you in your diabetes education prevention as well as your control programs and classes.

SLIDE 98: National Diabetes Education Program

Please feel free to contact either me directly, Michelle Owens-Gary, at Mowens1@cdc.gov, or you can also contact the National Diabetes Education Program at 1-800-CDC-I-N-F-O, CDC-INFO.

SLIDE 99: Thank You

Again, we'd like to thank Tori, Moni, and Gary for sharing your expertise and your words of wisdom. Thank you again for joining us. This concludes the webinar.

SLIDE 100: Disclaimer