



VANDERBILT
**Cultural Contexts of
Health & Wellbeing**
INITIATIVE



Reframing Childhood Obesity: Cultural Insights on Nutrition, Weight, and Food Systems



With funding from the Robert Wood Johnson Foundation and in collaboration with WHO/ Europe's Behavioral and Cultural Insights Unit, the Vanderbilt Cultural Contexts of Health and Wellbeing Initiative uses cultural insights to help improve public health policy and healthcare delivery.



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Executive Summary



As a disease, obesity is defined as excess adipose tissue that presents a risk to health. This definition allows for the fact that some types of body fat are associated with increased risks of metabolic illness, such as type 2 diabetes, while others are not. In practice, however, categories of “overweight” and “obesity” are defined by excess overall weight measured by Body Mass Index [BMI, kg/m²], which turns out to be a poor predictor of individual metabolic health. Since 1975, the prevalence of children classified as overweight or living with obesity based on BMI increased more than four-fold, from 4% to 18% globally. As a result, childhood obesity has been declared a global epidemic, and public health efforts around the world have mobilized to improve children’s diets and weight-related health outcomes.¹

Based on the conventional energy-balance model (weight gain results from more calories consumed than expended), obesity has long been seen as the result of personal choices, with interventions largely focused on changing individual behavior around diet and exercise. While improving nutrition and levels of physical activity is beneficial, focusing on individual choice can unintentionally contribute to weight discrimination, feeding into deep-seated cultural narratives that see being overweight as the result of a lack of self-discipline or a moral failing.

An emerging consensus in the field of obesity research points to the need to look beyond individual choices to address upstream cultural, commercial, and structural factors that produce obesogenic environments. This report contributes to that work. We show how public health programs can work with, not against, cultural traditions and norms—harnessing local creativity to change nutritional outcomes. We point to widespread weight discrimination, even in clinical settings, and the limitations of BMI as a diagnostic measure. Bringing in the perspectives of those living in large bodies, and acknowledging that shaming is an ineffective public health tool, we adopt a justice framework in which all body types are seen as deserving of health and health care. Recognizing that childhood nutrition and obesity result from the interaction of complex physiological, cultural, and commercial systems, we document holistic approaches to show how policy silos can be overcome to produce more equitable and effective health outcomes.

This report focuses on three key areas in which cultural insights and global examples can help improve health policy around childhood obesity by recognizing that:

1. Food is more than

nutrition: While food is a vehicle for nutrients, people make food choices based on cultural norms, personal tastes, and structural constraints. Effective health policy and practices engage and build on cultural values around food and eating.

- rather than focusing on particular nutrients, acknowledge food as embedded in cultural contexts, allowing for creative adaptation to local circumstances [Brazil]
- protect children from marketing of high-energy, low-nutrient ultra-processed foods [South Africa and Mexico]
- understand and build on cultural dynamics around children's food, engaging youth through policy dialogue and educational programs [Japan and France]

2. Health is more than

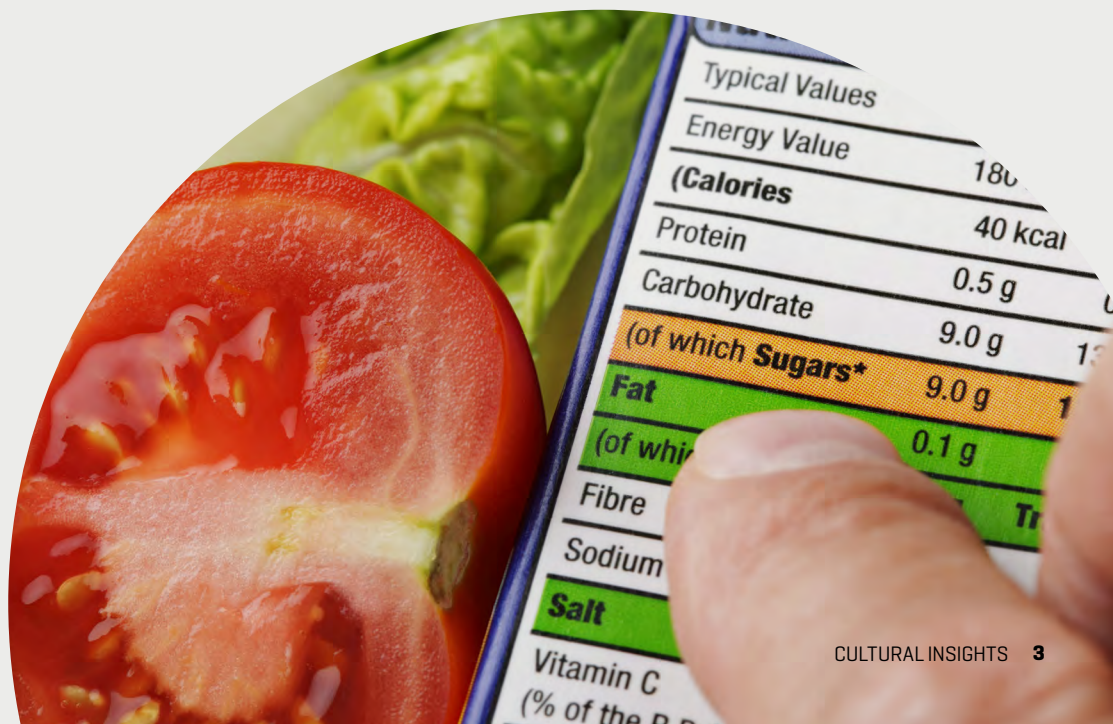
weight: In clinical care and population studies, children classified as overweight or obese are often reduced to this single aspect of their health. While certain types of fat are associated with health risks, weight discrimination also results in poor health outcomes.

- bring in marginalized voices, including those living in large bodies, to understand the contexts and challenges facing them
- actively fight weight bias and fat shaming, acknowledging that weight stigma and discrimination place youth in vulnerable conditions [Brazil]
- acknowledge the limits of BMI in assessing individual risk, treating it as one risk factor among others [Japan]

3. Diet is More than

Individual Choice: Cultural and commercial systems frame individual diets. A systems approach can reveal how colonial legacies are encoded in global food systems that supply the market with cheap, convenient, and hyper-palatable ultra-processed products.

- address the responsibility of global corporations as key drivers of nutritional health, and their role in producing cheap ultra-processed foods [Chile]
- integrate policy silos to deal with interdependent political, commercial, and cultural systems that produce inequalities associated with poor nutrition [Netherlands]
- adopt decolonizing approaches that address structural forms of racism and exclusion [Māori]



Global Examples

Crow and Zuni Nations

Indigenous Food Systems and Health

Programs based in food sovereignty movements build on traditional agricultural practices and foods to offer integrated approaches to children's diets and body sizes.

Mexico

Reducing Soda Consumption

Public health efforts to combat high levels of soda consumption have included taxes, regulations on marketing in schools, and labeling guidelines.

Brazil

Anti-Fat Discrimination Efforts

Federal and local laws treat large body size as a category of discrimination and provide public funds for accessibility barriers.

Brazil

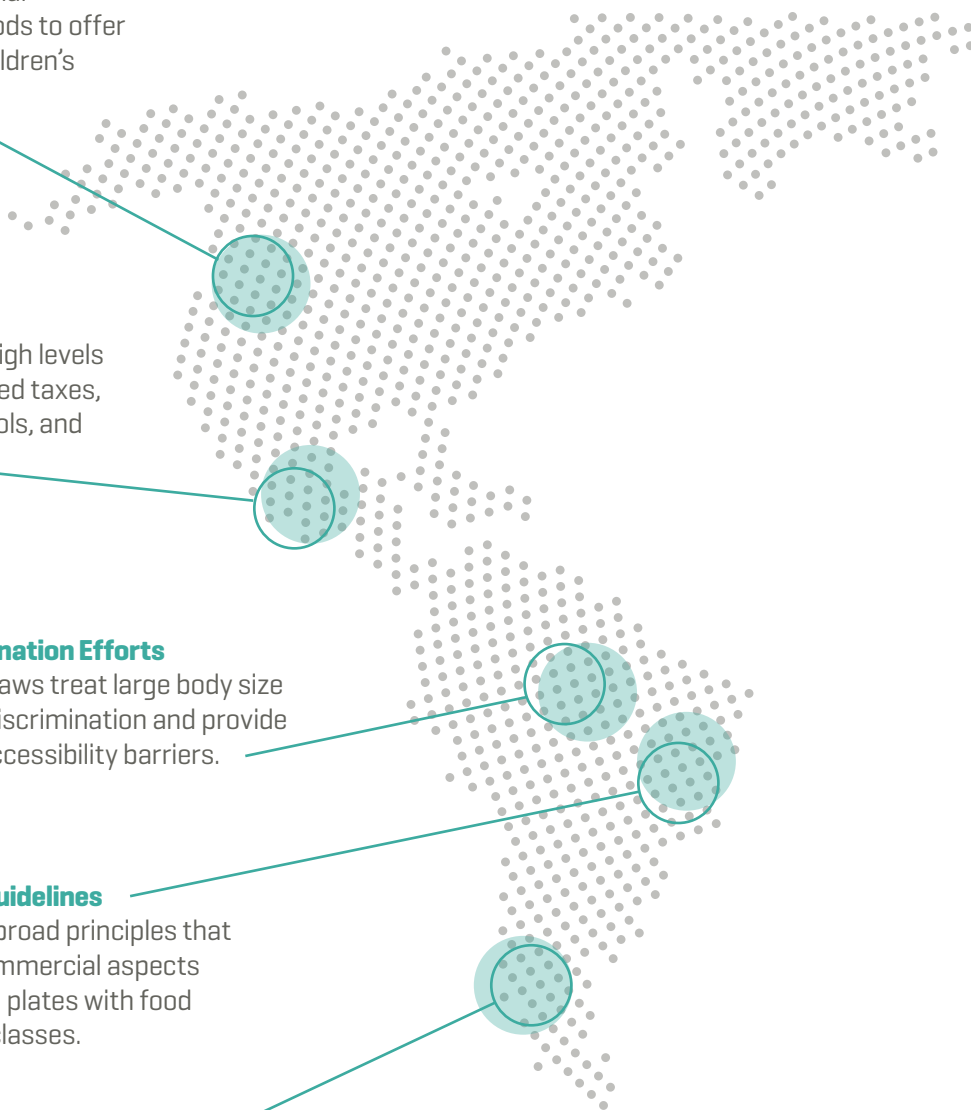
Values-Based Nutritional Guidelines

Brazil's guidelines follow 10 broad principles that focus on the cultural and commercial aspects of food and eating, depicting plates with food regularly eaten by all social classes.

Chile

Ultra-Processed Food Regulations

Taxes and labeling regulations have been successfully implemented.



Denmark

The Cities Changing Diabetes Programme

The intervention focused on diabetes prevention coordinates efforts with all stakeholders, including front-line workers, policymakers and administrators from the municipality, schools, and nurseries.

The Netherlands

Health in All Policies

The Amsterdam Healthy Weight Approach works across government units, civil society, and private sectors for an integrated approach to child weight.

Japan

Alternative Biometrics

Japan's controversial Metabo-Law mandates annual checkups that include a battery of laboratory tests in addition to body size measures.

France

School Lunch Program

Nutrition and taste are the two goals that drive their school lunch program. Schools decide how to implement the State's nutritional guidelines while following the traditional French format of several courses per mealtime.

South Africa

Regulating Marketing to Children

Government and food companies agreed to limit and restrict marketing of processed foods to children.

New Zealand

Māori Systems Thinking

Public health efforts have built on Māori systems thinking, introducing a holistic and collective approach to community interventions.

Overview

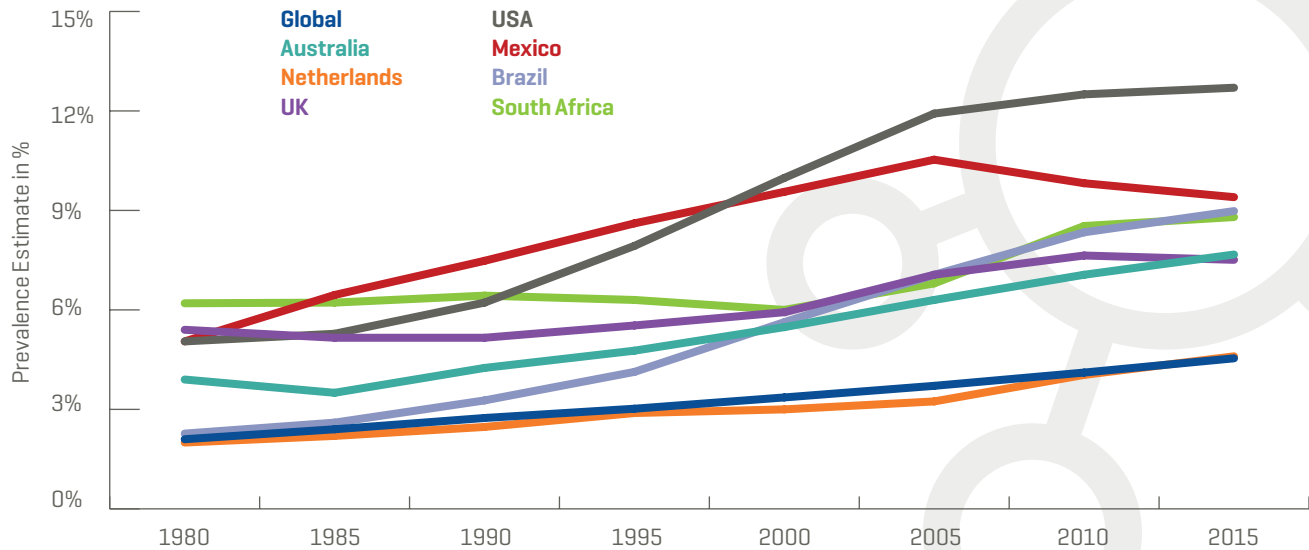
This report offers policy insights on childhood nutrition and obesity by bringing together data on lived experience, cultural contexts, and historical patterns of exclusion with biomedical models developed through public health and epidemiological research.² Comparing biomedical models to cultural ways of conceptualizing food and body size can reveal implicit biases encoded in diagnostic categories while bringing traditionally marginalized voices into the public health conversation. This perspective can lead to more effective policy and clinical care while addressing health disparities.

We adopt a decolonizing framework in which all body types are seen as deserving of health and health care. In this, diet and weight are viewed not just as individual decisions but as part of broader cultural lifeways, commercial systems, and colonial legacies. Drawing on the social science literature, a decolonizing approach³ to child nutrition and health:

- (1) works across traditionally bounded silos of knowledge to see biology, culture, markets, politics, and the environment as intricately interrelated systems that produce certain health outcomes;
- (2) brings in the voices and experiences of those living in large bodies to critically examine biomedical categories such as BMI that are built on historically racialized and gendered ideals; and
- (3) recognizes the colonial patterns of exclusion reproduced in commercial systems and obesogenic environments, looking to Indigenous alternatives that move beyond the focus on individual choice.

As a disease, obesity is defined as excess adipose tissue that presents a risk to health. While such textbook definitions recognize the differential risks from different types of fat, in practice the categories of “overweight” and “obesity” are defined by the Body Mass Index (BMI, kg/m²), which turns out to be a poor predictor of individual metabolic health. Since at least 1975 there has been a dramatic increase in children’s (and adults’) body sizes as measured by the BMI in the U.S. and globally. By 2017-18, the overall rate of U.S. children classified as “obese” was 19.3%, with significantly higher rates in low-income households and among Native American, Black, and Hispanics.⁴ Following its recognition as a global epidemic in the late 1990s, major public health efforts have focused on slowing the trend—and we highlight a number of innovative strategies in this report—but overall, the numbers continue to rise.

Obesity estimates among children [2-19 yoa]



Based on Global Burden of Disease Collaborative Network, 2017⁵

There is a seemingly simple explanation in the standard energy balance model: more calories consumed than expended results in increased body fat and susceptibility to diabetes and other illnesses.⁶ And a seemingly simple solution: reduce caloric intake (by eating less) and increase caloric output (through physical activity). But looking more closely, our body size categories and metrics such as BMI are more complicated than they first appear, mediated by cultural, commercial, and biological factors. For example, the BMI, a population measure used to create classifications of over- and underweight from percentile deviations from the mean, is the product of a particular cultural context and historical trajectory, one that subtly encodes biases based in Western European ideals and that is imperfectly related to health risks in individuals.

Models should recognize that what we label “obesity” is produced by interrelated systems in which human biology interacts with environments, social norms, economic structures, and historical legacies. For example, how calories are metabolized depends not just on quantity but also on quality and interactions with the gut biome. This, in turn, depends on what one eats, which is influenced by cultural norms and commercial interests: a majority of U.S. children’s calories come from processed foods, engineered by companies not only to appeal to tastes but to shape them in ways that can be almost irresistible.

There are well-documented health risks associated with certain types of body fat in U.S. and European populations.⁷ The BMI can capture this link at a population level: in adults, there is a strong linear relationship between BMIs above 23 and risk for Type 2 diabetes and cardiovascular disease. An estimated 30% of adults with obesity have T2D. Among overweight children, the occurrence of T2D is increasing, although at much lower rates than adults. But since it does not distinguish between types of body fat and between fat and other tissue, the BMI is a poor diagnostic of individual metabolic health.

Thus, while addressing health risks, we should also avoid reducing large bodied individuals to just their weight. Doing so ignores the many metabolically healthy people with high BMIs and contributes to social stigma, feelings of shame, and reluctance to seek care.⁸ Weight discrimination and a focus on dieting and self-control results in many large-bodied children experiencing social development issues, low self-esteem, and poor academic performance. These social and psychological outcomes—manifest through stress, anxiety, isolation, eating disorders, and reluctance to seek care—in turn contribute to poor health. For adults, weight discrimination significantly increases risk of mortality independent of BMI, and the evidence is clear that it decreases children’s wellbeing. Emily Yates-Doerr calls for “translational competency” as a way to put biomedical

classifications into dialogue with the lived experience of those we are trying to help.⁹ Looking beyond weight and BMI, there are more precise measures of health risks that do not carry socially stigmatizing connotations (e.g., levels of glucose, cholesterol, triglycerides).

The varied causes of large body size in children are often treated as an amalgamation of discrete variables, but Rafael Perez-Escamilla argues that they are best understood as part of an integrated system with many feedback loops. Stanley Ulijaszek sees these as systems within systems, writing that the food and beverage industry’s “strategies promoting narrow epidemiological understandings of obesity shift blame from foods to diet,” which is to say from structural and systemic factors to one of individual choices. In fact, the wide availability of cheap and hyper-palatable ultra-processed foods is a major contributor to increasing body sizes and poor nutrition in the U.S. and around the world. While interventions have long focused on individual diet and decision-making, a systems perspective recognizes that individual food and lifestyle choices are embedded in larger environmental, economic, and social contexts.

This report advances a decolonizing approach to childhood obesity, using cultural insights to examine biomedical and commercial influences on diet, weight, and individual behavior. Our effort builds on the National Academies’ Roundtable on Obesity Solutions’ three priority areas of emphasis: (1) structural racism/social justice; (2) stigma/biased mental models; and (3) effective health communications. A recognition that the health effects associated with large body size are tied to structural racism and histories of colonialism is essential to achieving health equity. We show how children’s nutrition is shaped by social and cultural factors and embedded in a commercial system that profits from selling ultra-processed foods.

We draw lessons from Indigenous food systems to imagine what a decolonized, systems-based approach might look like. This requires bringing new voices into the public health conversation, including Black, Indigenous, youth, and large-bodied perspectives. It also requires learning from the experiences of communities around the world, acknowledging that there is no one solution but multiple pathways to better health and nutrition. We call for a view of the “obesity problem” that de-centers the role of the individual and instead places all of us in a network with one another.

Decolonizing global health is “a movement that fights against ingrained systems of dominance and power in the work to improve the health of populations, whether this occurs between countries, including previously colonizing and plundered nations, and within countries, for example the privileging of . . . research-based knowledge formation over the lived experience of people themselves.”

Mishal Khan and colleagues (2021)¹⁰



María, 6, drinks a soft drink as her mother Roberta, 24, takes care of her shop at the city market in San Cristóbal de las Casas, in the southern state of Chiapas, México. [AP Photo/Moyses Zuniga].

Food is More than Nutrition: Cultural Meanings and Commercial Influences on Children's Diets

Third grade children eat lunch at an elementary school in the Edogawa district of downtown Tokyo. The school uses local vegetables grown in urban gardens for their school lunches. Komatsuna, a green vegetable traditionally famous in the area, is used in making breads cakes and ice cream and plays a key part in the dietary education of the local children to increase their awareness of traditional food and health.

What we eat is meaningful, and food is much more than a vehicle for nutrients. Medical approaches to nutrition tend to focus on what happens after swallowing—the biochemical and physiological effects—and work backward from there to make dietary recommendations. But people eat food, not just nutrients, and with food, what happens before it enters the mouth is just as important as the digestive processes. That is to say that people make food choices based not only on nutritional values but on cultural norms, personal preferences, and structural constraints—and that these choices have physiological impacts.

Many variables contribute to large body size among children, including genetic and epigenetic factors, gut microbiome interactions, physical activity, and diet. A central focus of public health efforts has been on diet, developing nutritional guidelines aimed at influencing individual food choices. But individual preferences do not occur in a vacuum—they develop in interaction with cultural and commercial environments. Given structural constraints and competing messages about desirable body sizes from social media and public health, as well as culinary traditions and preferences, individual choices are often highly restricted. Thus, we shift the focus from individual choice to upstream factors, including the cultural and commercial contexts of food, to make three points:

First, food and the ways people eat are about cultural norms, social identities, and taste preferences as well as about getting nutrients into the body. We all know this from personal experience, but it is hard to integrate into models and interventions based around nutritional metrics and daily recommended percentages. For children and adults, the provisioning of food and eating involve emotional attachments, including love and care, religious and social strictures, and taste preferences. Familial and cultural traditions shape childhood eating habits and form the basis for adult habits, but these are not static. Cultural values around food—like all cultural processes—are open and dynamic, not simply replicating established norms. Thus, nutritional and weight-based policy and interventions need to take seriously the changing cultural contexts and culinary desires of target populations.

Second, processed food and beverage companies understand well that food cultures are not immutable, and have successfully integrated their products into daily lives and cultural trends. Children, and especially children of color, have been particularly targeted in marketing campaigns for sodas and cheap, convenient, and hyper-palatable packaged foods—and this is true around the world, and not just in high income countries. Sodas and ultra-processed foods are major contributors to poor nutrition among adults and children. While their health impact is documented, less understood from a public health perspective is the appeal of junk food, sugary beverages, and ultra-processed, packaged foods to those who actively consume them. Taking into account their appeal, policy should limit marketing exposure for children.

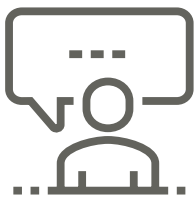
Third, public health programs should seek to work with cultural processes, seeing them as a source of possibilities and potential rather than as an obstacle to health and nutrition. Just as commercial food and beverage companies take children's preferences seriously, public health policy can as well. A cultural contexts approach takes seriously the perspectives of those we are trying to help, bringing to the public health conversation a concern with the desires and

preferences that produce biomedical outcomes, allowing us to see these as parts of interrelated systems. By acknowledging the interconnected nexus from farm to fork, a child-centered approach to policy and programming can develop healthier relationships with food.¹¹

Food, Identity, and Caring

Food is an especially intimate area of daily life, tightly linked to self-identity and embedded in particular political economies. Think about one's own food preferences: a nostalgic meal from childhood; a treat to indulge with on special occasions; dietary prohibitions such as keeping halal or kosher; or a moral or political preference for an organic or vegan diet. In these ways, food is part of social identity, deeply associated with family, home, and community. We are what we eat, culturally as well as biologically—and food has to be food to think with as well as to nourish.

Since food is so integral to identity, it is tricky to tinker with—and just because something is “good or bad for you” is often not enough to change behavior. Thus, when we think about trying to improve nutrition and modify what people eat, we should keep in mind that this can be seen not just as promoting better



Bee Wilson's First Bite¹²

Surveying cultures across the world, Wilson explains how food is presented to children as love, and sometimes forgiveness. These early experiences and exposures build memories that can create palates. Wilson shows that food habits are created, built, and formed within the context of relationships—with family and with broader cultural and economic communities. Because of this, eating habits and cultures of food have the power to change for the better. For example, Japanese cuisine up until World War II consisted broadly of carbohydrate-heavy foods such as yams and radishes. The post-war economic boom led to widespread refrigeration, more ingredients, and new fusions of flavors, creating the national cuisine as it is known and celebrated today, filled with soups, fish, sushi, and umami flavors. We might be products of our own food cultures, but they are more malleable than we may think.

health but as a challenge to one's fundamental sense of self and identity. At the same time, food cultures and diets are dynamic, always incorporating new ideas—or old ideas from elsewhere in new ways, such as with the diverse fusion cuisines that have popped up around migration.

In many areas, poor nutrition is correlated with declines in traditional diets and increased consumption of inexpensive processed foods. This includes so-called “children-friendly” foods, which tend to have high calories but low nutritional value. In the Western tradition, children's food has come to be seen as apart from adult food, and companies have worked with that cultural distinction to play to—and shape—children's preferences for sweet things. Gastro-physicist Ole Mouritsen argues we have an innate preference for not only sweet but also for umami—which promote satiety—but that companies have pursued processed foods high in sugars, salt, and fat, and those have come to be normalized as “naturally” what kids like. Mouritsen works with the Copenhagen Taste for Life program to use umami to meet children where they are in terms of taste, class differences, and the desirability of healthy foods.

For caregivers and children, the provisioning of food and eating together invokes powerful emotional attachments, and family and cultural norms shape childhood eating habits and form the basis for adult habits. Eating is usually a group activity, and a primary site for socialization and family bonding. Yet, this can conflict with nutritional recommendations that focus on one individual. We need to remember that individual diet choices affect others, and so instigating change involves the whole family or community. A child-centered approach to nutrition policy recognizes the important role of informal socialization and formal education about food systems.¹³

And just as eating is a group activity, the provisioning food for a family is often an expression of care. Daniel Miller followed North London shoppers on trips to the grocery store—and found that the act of shopping is a key means of communicating concern, affection, and love. Processed foods and sodas are a big contributor to poor nutrition.¹⁴ The innovative efforts to tax and label can be effective at curbing junk food consumption, but keep in mind that for lower income (like other) families, inexpensive packaged foods can serve as an affordable treat, a sign of devotion in a context of limited resources. What we might see as unhealthy junk food

may be tied to a mother's love for her children or a spouse's affection for a hard-working partner. Such a perspective is not a part of most public health conversations around nutrition. But, as Elizabeth Roberts writes, “while experts aren't certain that food is love, it seems like corporations are,” adding that corporations “are happy to help you share the love with all of your relations, spreading pleasure and fatness.”¹⁵

Biomedical approaches to nutrition often reduce eating down to measurable quantities: calories and grams, percentages and numerical proportions. Anthropologist Emily Yates-Doerr calls this the “metrification” of diets. Some of us have trained ourselves to think in terms of recommended daily allowances, but that is not how most people organize their diets and cooking—especially the most marginalized, dealing with time poverty, financial constraints, and other stressors. For most, food and eating are about love and identity as much as calories, but it is hard to translate “love” into grams or ounces. In this context, public health dietary recommendations can seem out of touch and even alienating.

“The Golden Rule contained in the Dietary Guidelines for the Brazilian Population is indisputable: Always prefer fresh or minimally processed foods and culinary preparations to ultra-processed foods. So simple, as healthy eating should always be”

Carlos A. Monteiro¹⁶



At a policy level, one way forward is to focus on principles and goals rather than overly detailed recommendations. Michael Pollan famously prescribes: “eat real food, not too much, and mostly plants.” Similarly, when Brazil revised their dietary guidelines in 2014 they opted for ten broad principles. These include limiting consumption of processed foods; eating regularly, deliberately, and with others;

and to be wary of food advertising. They do not mention specific nutrients; in fact, most of these are focused on the cultural and commercial aspects of food and eating. For the accompanying visual representations, they chose to depict balanced meals in terms of realistic plates based on foods that are regularly eaten by all social classes.¹⁷

Dietary Guidelines for the Population of Brazil¹⁸

1. Make natural or minimally processed foods the basis of your diet: Natural or minimally processed foods, in great variety, and mainly of plant origin, are the basis for diets that are nutritionally balanced, delicious, culturally appropriate, and supportive of socially and environmentally sustainable food systems.

2. Use oils, fats, salt, and sugar in small amounts when seasoning and cooking natural or minimally processed foods and to create culinary preparations: As long as they are used in moderation in dishes and meals based on natural or minimally processed foods, oils, fats, salt, and sugar contribute to diverse and delicious diets without making them nutritionally unbalanced.

3. Limit consumption of processed foods: The ingredients and methods used in the manufacture of processed foods – such as vegetables in brine, fruits in syrup, cheeses and breads – unfavorably alter the nutritional composition of the foods from which they are derived. In small amounts, processed foods can be used as ingredients in dishes and meals based on natural or minimally processed foods.

4. Avoid consumption of ultra-processed foods: Because of their ingredients, ultra-processed foods such as salty fatty packaged snacks, soft drinks, sweetened breakfast cereals, and instant noodles, are

nutritionally unbalanced. As a result of their formulation and presentation, they tend to be consumed in excess, and displace natural or minimally processed foods. Their means of production, distribution, marketing, and consumption damage culture, social life, and the environment.

5. Eat regularly and carefully in appropriate environments and, whenever possible, in company: Make your daily meals at regular times. Avoid snacking between meals. Eat slowly and enjoy what you are eating, without engaging in another activity. Eat in clean, comfortable and quiet places, where there is no pressure to consume unlimited amounts of food. Whenever possible, eat in company, with family, friends, or colleagues: this increases the enjoyment of food and encourages eating regularly, attentively, and in appropriate environments.

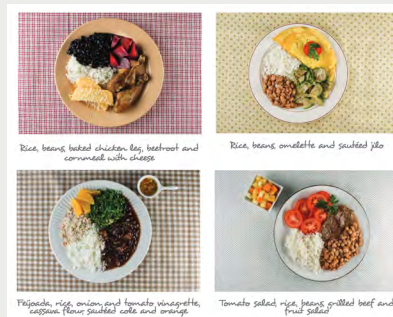
6. Shop in places that offer a variety of natural or minimally processed foods: Shop in supermarkets and municipal and farmers markets, or buy directly from producers or other places that sell varieties of natural or minimally processed foods. Prefer vegetables and fruits that are locally grown in season. Whenever possible, buy organic and agro-ecological based foods, preferably directly from the producers.

7. Develop, exercise and share cooking skills: If you have cooking skills, develop them and share them, especially with boys and girls. If you do not have these skills – men as well as women – acquire them. Learn from and talk with people who know how to cook. Ask family, friends, and colleagues for recipes,

read books, check the internet, and eventually take courses. Start cooking!

8. Plan your time to make food and eating important in your life: Plan the food shopping, organize your domestic stores, and decide on meals in advance. Share with family members the responsibility for all activities related to meals. Make the preparation and eating of meals privileged times of conviviality and pleasure. Assess how you live so as to give proper time for food and eating.

9. Out of home, prefer places that serve freshly made meals: Eat in places that serve fresh meals at good prices. Self-service restaurants and canteens that serve food buffet-style charged by weight are good choices. Avoid fast food chains.



10. Be wary of food advertising and marketing: The purpose of advertising is to increase product sales, and not to inform or educate people. Be critical and teach children to be critical of all forms of food advertising and marketing.

Soda as Love

Soda holds a social and cultural role in many Mexican households and communities. It has become integrated into many family celebrations and meals, something to share with a child as a treat, a small reward after a difficult day. Soda has even replaced traditional sweets in Indigenous spiritual practices in Mayan communities. As a result, Mexico has very high rates of soda consumption (137 liters on average per year) which has come to be seen as a major public health problem, contributing to the country's high obesity and Type 2 diabetes rates (38.4% for 12-19 year olds).¹⁹ In response, Mexico instituted a tax on high-sugar beverages, mandated prominent warning labels on processed foods, and started a major public health publicity campaign encouraging citizens to forgo soda and ultra-processed foods. In September 2020, a law in Oaxaca officially went into effect that restricts the sale, donation, or supply of sugary beverages and high-calorie packaged foods to minors, with an explicit prohibition on the sale of such products in schools. Since this law went into effect in Oaxaca, other similar initiatives have emerged in 25 of Mexico's 32 states.



Processed Food Labels in Mexico

While they have reduced consumption, soda and sugar taxes are rooted in the idea of individual responsibility and choice.²⁰ The cultural context of soda consumption is complex: it is fueled by corporate interests and contributes to high rates of diabetes, but it also has become part of the social fabric in Mexico. Elizabeth Roberts observes that Mexican public health officials have targeted individual behavior in their efforts to reduce soda consumption, but largely ignore larger structural forces (such as the North American Free Trade Agreement) as well as the cultural and emotional role soda plays in people's lives. Roberts asks, "what if we also thought of soda as a substance

transmitting love, not only empty calories? What if we traced how sugar and dye bind people together as well as make them diabetic?"²¹ She is not suggested we ignore health concerns around soda, but that public health policy needs to take into account the important role it plays in families and Mexican society. Similarly, Abril Saldaña-Tejeda highlights the inequalities built into a focus on individual behavior and decisions: "when it comes to weight and healthy eating, it is those who are 'not eating right' who find pleasure in chips and coke, who are supposed to lose pleasure. Killing their joy is done for the greater good".²² Tejeda shows that blaming individuals for their weight intensified in Mexico during the COVID-19 era due to messaging about BMI as a risk factor.²³

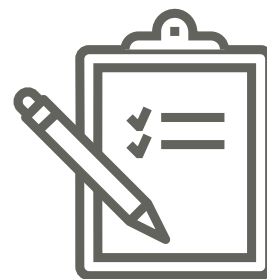
Engaging Cultural Processes

In public health, culture is often viewed as a barrier to treatment or an obstacle to health. Many well-intentioned interventions seek to "overcome" or "break down" cultural conceptions (about blood, pills, or time, for example) in order to improve treatment and delivery. But, rather than viewing culture as a static thing or inalienable trait, a more accurate view sees it as a dynamic process, an ever-changing arrangement of imperfectly shared understandings and practices. It is important that we not reduce people to mere cultural automatons; in living their lives, individuals the world over are not trying to recreate the past, but living for tomorrow, oriented toward the future in new and imaginative ways. In this light, we can treat culture not as an obstacle to modern scientific practices, but as a source of potential change and possibility. From a public health perspective, this means we can engage people through their beliefs and not against them.

Changing eating habits is difficult, and efforts to improve nutrition have a better chance if they work with, not against, local food cultures. In India, scientists and public health officials have turned to traditional food practices for ideas on how to address rising diabetes rates. Ayurvedic science and the "plate method" (*Thali*) promote nutritionally balanced meals through varied textures and flavors, seasonal foods, and portion control by using small bowls. The Ayurvedic guidelines are not restricted to nutritional intake but also prescribe eating timing, family interaction during mealtime, proper rest, and intermittent fasting.²⁵ In this model, the focus is on overall well-being more than a particular illness or body size.

Reconstructing Obesity: The Meaning of Measures and the Measure of Meanings²⁴

Megan B. McCullough and Jessica A. Hardin turn the anthropological lens on obesity researchers. They find that the field's use of the culture concept is generally too instrumental. They write that "health interventions and health implementations that merely see culture as adaptive or maladaptive assume an instrumental quality whose only determinants of health and health choices is related to outcomes; we know from ethnographic studies that health choices are made for a myriad of complex cultural, economic, and political reasons that may not correlate with an outcomes based approach." They go on to suggest that rather than focusing on a biomedically singular (and assumed universal) obesity, we should recognize the multiple obesities that arise for different reasons and carry different meanings across contexts.



Children's food as an idea, conceptualized as something similar or distinct from what adults eat, is culturally driven and negotiated. In the context of the United States, the foods culturally understood and marketed as "children's food," often "fast foods" like pizza or chicken fingers, are often negotiated in the middle-class family setting. Mothers seek to prevent their children from eating such foods, which further intensifies their children's urges for them and consolidates the idea of these foodstuffs as kids' foods.²⁶ In other contexts, such as Bosnian and Iraqi refugees in Sweden, children take on responsibilities of "cultural integration" through food, introducing their families to "children's foods", such as hamburgers or pizzas, in order to help their families find belonging in Sweden. In contrast to the mothers in the United States, the Bosnian and Iraqi mothers in this context encourage their children's consumption of these foodstuffs.²⁷ Children's food consumption takes place outside the family in many cases, in schools, daycare settings, and after-school

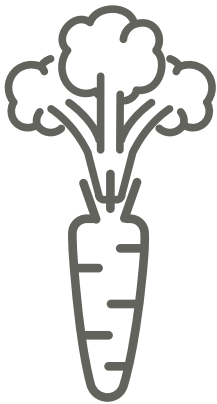
programs. The school lunchroom is not a space absent of stakeholder interests, politics, or even mortality.²⁸ It is a place where kids learn what to eat and how to eat it. We need to recognize youth as agents and schools as central locations where food is valued, judged, and eaten. School lunch programs can reveal insights into a country's nutritional priorities as well as students' knowledge about healthy eating behaviors.

In Trinidad and Tobago, between 2013 and 2018 a fourth of the budget for the School Nutrition Programme (SNP) was cut, but the number of meals remained the same. Initially, the program provided cultural and nutritious Trinidadian foods purchased from local producers, but the financial cuts shifted its menus to processed cheaper options, many acquired from the United States. As part of the adjustments, sugary drinks were integrated into the Trinidadian school food programs. Furthermore, this shift appeals to the globalized tastes of

Trinidadian school children, promoting the view of Western fast-food offerings as desirable and aspirational. As a result, the current strategy is to tailor the school lunch menu to resemble fast food.²⁹

In the United States, school meals became universally offered after World War II through programs developed in tandem with food corporations. The Healthy, Hunger-Free Kids Act of 2010 established new nutrition standards for school meals (with significant changes regarding salt and whole grains), and studies show that healthier school meals correlate with lower risk of obesity among children living in poverty. Further, the growth of universal free school meals has particularly benefited children from food insecure households.³⁰

France and Japan have developed programs that prioritize the preparation of nutritious food, the cultural values of food, and the socialization of eating. In 2005, Japan enacted the Basic Law of *Shokuiku* (Food Education) as a national intervention over diets and eating habits to address rising metabolic diseases in adults and childhood obesity. Its principles reinforce the importance of eating together, not skipping breakfast, and eating locally. Promoting a balanced diet, the law is applied in schools through nutrition educators that teach children to read food labels, avoid ultra-processed snacks, and appreciate regional produce and cuisines. Furthermore, *Shokuiku* encourages diversity in diet through meals with several small plates, allowing for the integration of different foods with different preparation styles.³¹



School Gardens

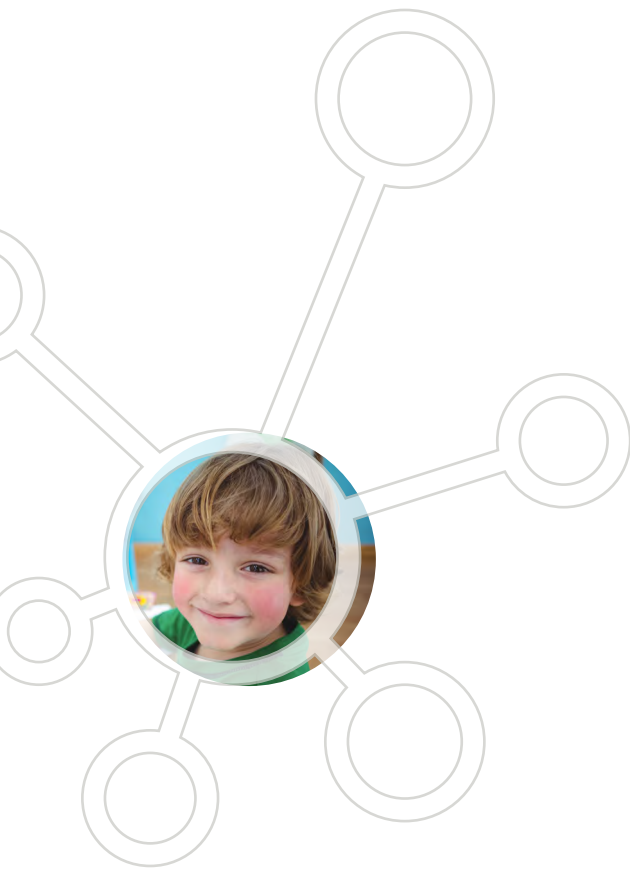
One way to reach kids where they eat is through the development of school gardens in connection with local cuisines and traditions. Gardens help students conceptually connect food production with consumption. While school gardens trace their origins to 1840s Sweden, today they are most plentiful in Italy and the United States. In the Italian model, school gardens form the basis of an integrated three-year curriculum covering environmental studies, biology, agricultural economics and food cultures. School gardens along with an integrated curriculum can significantly increase primary school children's nutritional knowledge. Engagement with school gardens also results in an improved range of fruit and vegetable preferences as well as an increased quantity and variety of vegetables eaten.³² One study of Latino youths involved in a gardening, nutrition and cooking program in Los Angeles revealed improved diet and decreased rates of obesity.³³ School gardens can thus act as a sustainable method for providing healthier, culturally grounded foods to children at least once a day, while also educating and engaging students in ways that change food preferences.

In France, there are no standardized national lunch programs. Rather, the French National Education Ministry has set out two broad educational goals for school lunch programs: nutrition and taste. These goals are to be executed as local schools see fit. For the first goal, government regulations outline the nutritional components that should be present in each meal, spread out over a series of courses. School lunch menus in France are created with the consultation of a nutritionist. Almost all foods are prepared in the school kitchen; they're not ready-made or frozen. Secondly, the valorization of taste is reinforced in the school

lunch gastronomy.³⁴ Students are served lunch at a table and in groups in the traditional French format of several courses: a starter, a main course with side dishes, a cheese course and then dessert. French school lunches also regularly serve dishes from the traditional French gastronomical canon: quiche, beef bourguignon, ratatouille, veal ragout, endive salad, or fish in butter sauce with vegetables. By encouraging students to eat freshly prepared national foods, they become familiar with how to prepare them in their own homes and practice mindful, nutritious eating.

Child-centered policy³⁷

Poor diets affect childhood physical, emotional, and academic development. Corinna Hawkes and colleagues propose a child-centered approach to food policies looks at systemic factors [scarcity, undernutrition, dietary imbalance, diet-related non-communicable diseases] but also the specific contexts in which children live their lives [such as social media, school lunch programs]. Seeking to make healthy diets available, affordable, appealing, and aspirational for children, Hawkes and her colleagues advocate supporting caregivers but also recognizing that children are “consumers” themselves, and active agents in the food system and its influences



Not only are children faced with food decisions at home and school, but the rise of social media has also allowed for food and technology industries to monetize children's engagement, following their interactions with friends and their emotional and behavioral relationships with brands. One study in England found that for youth eating healthy was associated with being "nerdy" and that products high in added sugar, fat, and salt were associated with popularity.³⁵ In addition to being inundated with advertising and influencers talking about food and body size, companies track children's online habits and purchasing patterns to encourage and reward youth with unhealthy products, a phenomena that disproportionately affects youth of color.³⁶

On the whole, the food industry, media and technology companies have largely managed to evade public and federal oversight for their role in producing obesogenic digital cultures. In a study of advertising in South Africa, 44% of all recorded television advertisements over four weeks were related to food, with the most commonly advertised foods for desserts and sweets, fast foods, hot beverages, starchy foods and sweetened drinks. Nearly 50% of the food advertisements appeared during family and children viewing periods.³⁸ Embracing WHO's recommendation for better regulation of TV food marketing, the South African government developed a code for advertising in collaboration with the major food corporation's consortium in 2008. The following year a pledge, known as the South African Marketing to Children pledge, was subscribed by the major food corporations thus committing to change their marketing practices towards children under 12 years of age. The public commitment was the single form of regulation, as it was expected that food industries would self-regulate, resulting mostly in non-compliance. Yamoah and colleagues show children continue to be highly exposed to food and beverage advertising, including alcohol, during child and family viewing times.³⁹ They also found that "cartoons, celebrities, brand benefit claims and health claims were used more often in unhealthy versus healthy food." The authors recommend tighter regulation and sanctions of the TV food advertising space.

In 2016, WHO Europe issued a report based on a comprehensive review of the influence of digital marketing on children's dietary behaviors. They call for the reduction of exposure to protect the developmental, neurological, and social nexus of children. In the US, the Children's Online Privacy Protection Act (COPPA) aims to protect the digital privacy of children. However, companies circumvent COPPA by setting terms of services that officially "ban" children under the age of 13 from their platforms, which does not work in practice.⁴⁰ The industry-led Children's Food and Beverage Advertising Initiative had moderate success in reducing children's exposure to food-related television advertisements, but it primarily applied to children under 12. To develop effective policies to shield youth from the harmful impacts of unhealthy food promotion, we have to rethink the traditional US policy frameworks for regulating marketing, advertising, and data practices.

The first step in making use of these ideas is to recognize that cultural traditions and social identity are powerful motivators in terms of nutrition, they are not set in stone: all cultural norms are dynamic, presenting the possibility of change and innovation. Second, marketing by big food and beverage companies has made great use of this insight to integrate soda, fast food, and packaged snacks into lifestyles. These should be better regulated. Third, we need to respect the tastes and other preferences of target communities and draw on community-driven interventions.

Health is More than Weight: Biomedical Metrics, Health Risks, and Weight Bias



Students finish a project on bullying after a class on weight prejudice at a public school in Recife, Brazil. A new law there requires teachers learn about weight-based discrimination so they can include the topic in their lessons. [Dado Galdieri/The New York Times]

In response to the dramatic and steady increase in average body sizes since at least 1980, obesity has come to be seen as a major public health threat—and changing individual behavior is seen as crucial to fighting the epidemic. Starting in the 1990s there was a successful effort to classify (and conceptualize) obesity as a *disease* in order to reduce the implicit moral stigma and recognize the multiple contributing factors. The empirical approach of the disease model is based on measurement, and virtually all classifications of obesity use a variant of the Body Mass Index (BMI).

But all categories—even scientific ones—are imperfect representations of reality, minimizing internal diversity to create analytic equivalences. The primary metrics and categories that we use around body size and nutrition (obesity, BMI, calories, fat) turn out to be more complicated than long assumed—and do not explain many variations in metabolic health, such as with large bodied but metabolically healthy individuals.

While addressing the health risks associated with certain types of fat, we also need to acknowledge the diagnostic limitations of body size metrics—and to avoid shaming and blaming those with large bodies. In both population studies and clinical care, overall health status often gets reduced to BMI, ignoring the many healthy large bodied people and unintentionally feeding into negative stereotypes that cause psychological distress. Patrica Nece shows how implicit bias and fat shaming are major barriers to large people seeking and receiving medical care.⁴¹

Recognizing that shame and moral blame are ineffective, and often counterproductive, instruments in the public health tool kit, we review the effects of weight discrimination and suggest ways large-bodied perspectives can be brought into the conversation. Weight discrimination is widely tolerated, even seen by some as desirable to disincentivize individual behavior. Large bodied patients overwhelmingly report that their caregivers focus on weight to the exclusion of other conditions. In terms of public health messaging, the goal of eradicating obesity communicates to journalist Aubrey Gordon that the world would be a better place without people who look like her: “even at a young age, I had been declared an enemy combatant in the U.S.’s war on childhood obesity. Bodies like mine had been declared an epidemic, and we were its virus, personified.”⁴² For some fat activists, even biomedical categories and terms such as “obese” and “disease” are felt as stigmatizing, equating a high BMI with illness.

We adopt a justice framework in which all body types are seen as deserving of health and health care. From this perspective, public health policy should weigh health risks along with the potential social and psychological toll when developing interventions to avoid stigmatizing and blaming those with large bodies. We recommend rethinking usage of potentially stigmatizing biomedical categories to promote more precise diagnoses and to avoid reducing large-bodied people to simply a medical condition. One way to balance risks suggested by population-level correlations with equity of care concerns is to treat weight (BMI) as a possible risk factor, among others, while promoting health for all body sizes. This entails actively fighting weight discrimination and fat shaming, acknowledging that weight stigma places youth in vulnerable conditions.

Cultural Variation in Body Size Ideals

Body sizes carry different meanings in different contexts: biomedical, social, cultural, religious, moral, historical. Biomedical categories, with the empirical virtues of detaching the biological body from the social one, have come to be applied as objective, universal standards. But they trace their roots to Western conceptions of fitness and beauty that

emerged from European ideas of racial superiority. Sabrina Strings shows that with the development of the slave trade, there was an explicit moral and legal value placed on thin European bodies.⁴³

Ideal body types arise in a particular cultural context through normalizing (making seem natural) certain parameters. We can see this process happening in real time with online youth culture. Social media algorithms have been shown to influence body size and shape ideals among children,⁴⁴ and a number of studies have shown a correlation between activities like scrolling through Instagram and negative body image.⁴⁵ Colonial legacies of naturalized hierarchies of body size are very much alive in pop culture, as Tressie McMillan Cottom details. She shows how the stigma toward large bodies is interwoven with racialized systems of control and dominance over non-white bodies in the U.S.⁴⁶ Similarly, in Brazil there is a correlation of darker skin color and higher BMI and lower socio-economic status.⁴⁷ For Black Brazilians there is a greater acceptance, even celebration, of large bodies, but in the dominant national discourse, large bodies are often linked to moral judgments about lack of self-control.⁴⁸



Weight and Food related Podcasts

In our literature review, we had to move beyond academic articles and policy reports to capture the lived experiences of those living in large bodies and the everyday impacts of contemporary food systems. We found ourselves especially inspired and informed by the powerful stories and cultural insights provided by podcasts such as:

- *Burnt Toast* with Virginia Sole-Smith
- *Around the Table* with Tess Bird and Stanley Ulijaszek
- *Maintenance Phase* with Aubrey Gordon and Michael Hobbes
- *Marcados* with Soledad Barruti.

Tracy McMillan Cotton captures the embodied struggles with black female identity in *Thick: And Other Essays*. Being born with features that defy the Eurocentric standards of whiteness, thinness, flatness, and gaps between thighs, Cotton explains how black women have spent centuries trying to delineate their positionally in a beauty myth that is encoded within historical, cultural, and political power dynamics.⁴⁹

There are, and have been throughout history, many ways of conceptualizing the human body and its ideal form as physically “healthy” and morally good. Among the Aymara, lean and thin bodies are seen as prone to sickness,⁵⁰ while for teenage boys in Nauru, to be lean and thin is associated with speed and agility.⁵¹ In many societies, what we would consider excessive body fat indicates abundance and good health. Emily Yates-Doerr examines large bodies in Indigenous Guatemala, showing that obesity is associated with abundance more than nutrition per se, and was not a fixed condition but a relational expression of the self.⁵² Similarly, in Samoa, fatness reflects the degree to which people are cared for—reflecting the strength and power of families and communities.⁵³ In Nigeria, gender and class are associated with different body sizes: while it is expected that men are lean and athletic, women are expected to embody the abundance and well-being of their households in larger body sizes, at times encouraged to overconsume rich porridges.⁵⁴

Beginning in the late nineteenth and early twentieth centuries, in Europe and the U.S. obesity came to be seen as a medical condition caused by overeating and treated through individual diet and corporeal discipline. In this, obesity as an illness was linked to moral narratives about lack of self-control and gluttony. In the U.S., John Harvey Kellogg (of Corn Flakes fame) promoted this view, advocating a low-protein, high-carbohydrate diet influenced

by religious precepts. Robert Lustig explains that Kellogg’s views on nutrition were influential in the creation of the American Dietetic Association in 1927, amplifying and institutionalizing his focus on individual eating behaviors.⁵⁶

Obesity, BMI, and Health Risks

While long listed in the International Classification of Diseases, in the late 1990s, the WHO and the U.S. National Institutes of Health formally recognized obesity as a chronic disease, followed by the American Medical Association in 2013. As Bill Dietz and others argued at the time, using the term “disease” was intended to reduce stigma: making it a biological illness and not a moral failing. The change in terminology also raised awareness of the new “epidemic” and stimulated research and public health funding.

Obesity is defined as abnormal or excess adipose tissue that results in increased health risks. This definition is consistent with research showing that different types of adipose tissue pose different levels of risk; that is to say that the type and location and not just the absolute mass of fat tissue matters. The problem arises in translating this definition into workable metrics for research and clinical diagnosis. The widely accepted standard to define categories of “overweight” and “obesity” is the Body Mass Index (BMI, kg/m²), a population measure that can be used to calculate over- and under-weight as percentile deviations from the mean. Though itself is not a cause of death, at the population level high BMIs are closely correlated with risk of Type 2 diabetes (85% of Type 2 diabetics are overweight; 30% of overweight adults have Type 2 diabetes), and with elevated risk of heart disease, kidney disease, liver disease, and stroke. The strong and linear correlation of BMIs above 23 and risk for Type 2 diabetes in European and U.S. adult populations largely justified the modern classification of obesity as a disease. Correlating BMI with health risks in children is more complicated—the plasticity of young bodies makes establishing baseline norms difficult—but rates of childhood diabetes are rising with average body sizes. Still, the greatest health risk for the population of children with high BMIs is development into adult obesity and the associated T2D and cardiovascular risks.⁵⁷ While the disease classification of obesity depicted the condition as one beyond individual control and called for medical support and attention, as categorized by BMI measures, it also defined all those with large bodies as having a disease.

BMI measures do tell us something, but in drawing the boundaries of “overweight” and “obese,” these become constructed categories that can both reveal risks and obfuscate other complicating factors. All categories, including scientific and empirical ones, erase internal diversity to create manageable and meaningful variables—they are constructed for that purpose by establishing conventional boundaries and cutoff points. In this, BMI-based categories of body size are not only representations of

empirical data but are also projections of professional norms and pragmatics (of what sort of data is available, for example). These become normalized, idealized, and pathologized through scientific, governmental, commercial, sociocultural institutions and communities of practice.⁵⁸ As we show below, the BMI is the product of a particular cultural context and historical trajectory, one that subtly encodes biases based in Western European ideals.

Fat in Four Cultures: A Global Ethnography of Weight by Cindi Sturtz Sreetharan, Alexandra Brewis, Jessica Hardin, Sarah Trainer and Amber Wutich⁵⁵

6

Common Themes

The authors of this innovative study explore how fat is perceived and experienced in Japan, the United States, Paraguay, and Samoa. They identify six common themes across these sites: 1] a widely shared belief that fat is an individual responsibility, although with a communitarian angle in Samoa and Paraguay; 2] narratives of fat as moral failure with use of individual blaming and shaming; 3] large-bodied people often respond to the perception of fat as unhealthy with displays of cheerfulness or cleanliness; 4] women faced harsher social scrutiny regarding their own body sizes and those of their children, even in contexts where men were more likely to be classified as overweight or obese; 5] fat is understood as the result of structural dynamics that included food costs and availability, time poverty, and shifts in work culture – however, individuals were blamed by their inability to better cope with these structural framings; and, 6] fat is conflated with other markers in defining individuals’ socioeconomic status, which contributes to systematic social exclusion.

Katherine Flegal shows the various judgments that go into creating BMI cut-points for age-appropriate growth charts used in screening children.⁵⁹ She concludes that “the use of BMI as part of a screening algorithm does not in fact require a particular definition or a particular label and can be separate from any definitions used for prevalence estimates.” Where the lines are drawn matters in terms of public health responses and clinical care. In 1998, there was a big jump in obesity rates in the U.S. because of a lowering of the BMI cut-off point by the NIH to align with WHO standards—and resources and care provisioning were mobilized as a result.⁶⁰

The BMI originated with the work of nineteenth-century Belgian statistician Adolphe Quetelet. His aim was to contribute to the burgeoning field of statistics, a way of advancing the Enlightenment project of quantifying the world in the service of progress. In 1832, Quetelet calculated a body proportion formula for defining the average, or normal, man at different ages, based on Belgian data samples.⁶¹ While this work was based on empirical data, it also postulated the average as an ideal type, reflected in conventions of measuring deviations from the mean, in this case of Northern European males. Quetelet’s Index came to medicine through its adoption by insurance companies, which used it to assess mortality risks for actuarial tables.⁶² In the twentieth century, actuaries kept exploring the health risks of body size and continued to update tables for “desirable weight” for men and women. In 1980, the *Dietary Guidelines for Americans* cautioned about the health risks of

diet and weight, and provided body weight tables based on actuarial guidelines.⁶³

In the 1970s specific thresholds for the categories “overweight” and “obese” were defined using height/weight formula. A 1972 paper by epidemiologist Ancel Keys highlighted the significance of Quetelet’s work, which he adapted and renamed the Body Mass Index (BMI). Both Quetelet and Keys were interested in depicting *population* trends in terms of body size and neither proposed this metric as a tool for assessing an individual’s performance with a standardized distribution.⁶⁴ Nonetheless, it became the basis for current standards because it is relatively easy to measure, and as a result there exist good population-level data (which was Quetelet’s initial attraction).

Given the plasticity of young bodies, adult BMI references are not applied directly to children. Different age and sex specific height/weight growth charts are used to calculate overweight and obesity categories among children, defining these either as a Z-score or a percentile of BMI distribution.⁶⁵ The U.S. CDC refers to a specific BMI-for-age chart with percentile cutoffs to establish levels of increased risk of adverse health outcomes,⁶⁶ while the WHO uses its own universal growth chart for children.⁶⁷ Still, both the CDC and WHO standards of overweight and obesity for children over 5 years of age align closely to the adult BMI cut-offs of 25 and 30 kg/m.⁶⁸

Weight category for Children	WHO		CDC
	< 5yos	5-19 yos	2-19 yos
Overweight	2 standard deviations above WHO Child Growth Standards median	1 standard deviation above the WHO Growth Reference median	85th to less than the 95th percentile for age on CDC chart
Obesity	3 standard deviations above the WHO Child Growth Standards median	2 standard deviations above the WHO Growth Reference	95th percentile or greater for age on CDC chart

The methodologies for building these charts (e.g., excluding higher weights from analysis or referencing non-obese data sets as a reference) create standards that are aspirational as well as empirical. The diagnosis of obesity through BMI cut-offs permeates the construction of growth charts for children, thus creating a universal narrative of human development from data sets that do not include all sizes or a wider population. While standard growth charts include variations for sex, taking into account the biological aspects of a gendered body, neither the WHO nor the CDC present official adjustments for ethnicity or race. Additionally, the 5-19yo growth charts are built with US survey data, however are used as international standards.

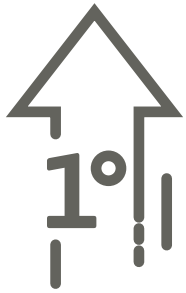
By 2017-18, the overall rate of U.S. children classified as “obese” was 19.3%, with much higher rates among low socio-economic household and Blacks, Hispanics, and Native Americans.⁶⁹ Unsurprisingly, then, rates of T2D in children are rising with obesity rate in the U.S. and globally, disproportionately affecting non-white populations⁷⁰, but the numbers are still small (children’s T2D rates are 0.034% for Black and 0.045% for Native American populations). Type and location of body fat matters significantly to health risk, and the recognized physiological pathway of T2D starts with visceral fat, which produces insulin resistance. Yet, Venkat Narayan and others have found South Asian T2D phenotypes that have different BMI correlations and appear to work along a different physiological path—illustrating the dangers of extrapolating out from U.S. and European population studies (where the overwhelming amount of T2D research has been conducted).⁷¹ This also points to the need to decouple conventionalized associations of obesity with certain genotypes and phenotypes.

The standard energy balance model holds that too many calories (especially from processed foods) combined with a sedentary lifestyle has led to the rise in obesity and Type 2 diabetes. But growing evidence shows that the causes of large body sizes in children are varied, resulting from multiple interacting factors. Fatima Cody Stanford and others see obesity as a multifactorial disorder in the central nervous

system that results in chronic body inflammation.⁷² She argues that the amount of calories is not the primary driver of weight gain (though the quality of calories does matter). Empirical studies have produced mixed results regarding the carbohydrate-insulin model (which postulates that high carbohydrate diets are fattening because they increase insulin secretion while suppressing metabolism and satiety), but it still may well be that increases in body size (and the obesity rate) are primarily due to increased consumption of refined carbohydrates.⁷³

Categorizing obesity as an “adiposity-based chronic disease” (ABCD) focuses on the role of inflammation, identifying a central nervous system pathway that can drive co-occurrent inflammation, including in the adipose tissue. In this view, what needs to be treated is not the size but the inflammation and the brain-gut communication. The European Association for the Study of Obesity’s position is that obesity is an adiposity-based chronic disease, and they seek to improve disease classification by recognizes that it is “based on three dimensions, namely etiology, degree of adiposity, and health risks. The body mass index as a unique measurement of obesity does not reflect the whole complexity of the disease. Obesity complications are mainly determined by 2 pathological processes, i.e., physical forces (fat mass disease) as well as endocrine and immune responses (sick fat disease), which are embedded in a cultural and physical context leading to a specific ABCD stage”.⁷⁴ In these models, the BMI is no longer the key diagnostic tool.

Not all individuals classified as obese by BMI are ill—a sizable percentage have healthy metabolic indicators— and we have more precise measures (of blood pressure and glucose and cholesterol levels, for example) of risk factors that do not depend on the proxy of body size and weight. A 2016 study comparing BMI to the results of more precise measures found that half of those in the “overweight” and a quarter of those “obesity” categories had healthy metabolic measures while over 30% of those in the “normal” weight category has unhealthy metabolic measures. Given such results, the BMI is a poor indicator of metabolic health.⁷⁶



The Calorie

Originally a measure for steam engines, a calorie is the energy required to heat 1kg of water by 1 degree Celsius. Wilbur Atwater, an agricultural chemist at Wesleyan University, borrowed the idea of the calorie as a measurement of energy in food from German colleagues, introducing the notion in the U.S. in 1887. Based on elaborate laboratory studies--involving a chamber with water-filled walls, the burning of excrement, and precise measures of food consumed and thermal energy expended among his undergraduate subjects—Atwater determined that a gram of carbohydrate provide four calories of energy while a gram of fat averaged 8.9 calories [generally rounded up to 9]. We now know that different foods differ in the ways they are metabolized, resulting in different caloric values. But contemporary standards still follow Atwater's basic calculations assuming that there is a singular caloric value for the different macronutrients. Based in part of Atwater's effective evangelizing, the calorie became the main indicator for nutrition as related to weight, and led to an almost singular focus on controlling calorie intake. Given that fat was understood to be the most calorie-dense macronutrient [something the sugar industry exploited], a healthy diet was seen as low-fat, but often high in carbohydrates and added sugars.⁷⁵

Some propose a category for Metabolic Healthy Obesity (MHO) as a means to acknowledge those individuals that are categorized as obese but show no hypertension and within normal glucose and lipid metabolism parameters.⁷⁷ Several studies show that physical activity reduces cardiovascular diseases for all bodies, while inactivity poses higher risks to those with "normal" BMIs relative to active high-BMI samples.⁷⁸ In this light, we can see having a high BMI as one risk factor that, depending on the individual physiology, may or may not need to be treated depending.

In 2008, Japan reframed obesity as "metabolic syndrome" by implementing what is known as the Metabo Law, a mandatory screening policy focused on the risk of metabolic illnesses for those aged 40-74.⁷⁹ Criticized by many as intrusive, the program does have the virtue of including a range of metrics to assess metabolic health status, including height, weight, waist circumference, blood pressure, and a battery of blood tests for liver function, cholesterol levels, and other indicators.⁸⁰ Those classified as having heightened risk are required to attend behavioral counseling sessions.

Camara Phyllis Jones, as part of the Roundtable on Obesity Solutions, argues that we should view “the phenomenon not as an epidemic of obesity (a yes/no attribute) but rather as a shift in population distributions of body mass.”⁸¹ This perspective has implications for intervention strategies. Rather than depend on individual diet choice and exercise changes, it suggests shifting efforts toward changing the population-level distribution of body mass through policy and environmental change in neighborhoods (nutritious food, safe recreation), schools (snacks, school lunch, physical education), workplaces (stress reduction, physical activity), restaurants (caloric labeling, limits on trans fats), farms (agricultural subsidies), and transportation (sidewalks, bicycle lanes, mass transit).

Weight stigma and the health risk of weight-centered approaches

Virginia Sole-Smith and others argue that the disease approach does not dispel a deep-seated cultural narrative that large body size results from moral failure and a lack of self-discipline.⁸² In medicine, there has been a shift from disease-centered language to person-first language (i.e., “people living with obesity”) as an attempt to recognize people beyond

the illness. Fat advocates also call for a people-centered language but one focused on identity, embracing body size as a key aspect of themselves.⁸³ What is at stake is more than terminology and that there is a need for an open conversation on how language frames our understanding of people’s lives, health and well-being and how terms become barriers to provide better care to children across the globe.

Thus, while we are concerned with the health correlations of weight, it is also important that we consider what some term “fat justice.” While “fat” has many meanings and connotations, obesity has a clear and metric definition within biomedical understandings of body size. Language and terminology matter here. Public health discourses have shifted to person-centered language, preferring “people living with obesity” rather than the noun “obese.” At the same time, advocates and activists refer to themselves as “fat” or having “large bodies.” While the first uses metrics such as BMI to categorize health risk, the second approach recognizes body variabilities to advocate for a dignity and respect. We need to address social determinants of health, but also the social determinants of equity, including across different body types and sizes.

“We need to take obesity out of this sense of personal failure, this idea that we have to earn the right to health care. That only good people deserve these things is such a problematic concept, and really goes against what health care is supposed to do.”

Virginia Sole-Smith⁸⁴



Anti-fat bias is widespread and detrimental for health and wellbeing. Weight discrimination is itself a significant risk factor: 60% increased risk of mortality independent of BMI for those reporting weight discrimination.⁸⁵ Puhl, Luedicke, and Grilo report from their surveys that 65% of post-graduate healthcare students had witnessed health care providers making negative comments or jokes about patients who are obese.⁸⁶ That same study found that 95% of respondents felt “that is important to treat patients with obesity with compassion and respect.”

Thus, we find a simultaneous recognition of the importance of health equity for large bodies but also a persistent moralization in practice. Patricia Nece reports that large bodied people often do not seek health care because of the perceived stigma that “people with higher body weights are seen as failing to control their weight.”⁸⁷ Stigma also plays a role in representation, as fat activists and large-bodied people are usually not included in the decision-making of obesity policy. Nece observes that there is a growing recognition for the need for representation to help dispel basic stereotypes; still, there are many challenges to realizing inclusion that takes into account lived experiences across socioeconomic levels.⁸⁸

Many large bodied people feel that in terms of healthcare their lives are reduced to a single endeavor, that of weight loss, thus diminishing all other life experiences as secondary. Gregory Dodell, a weight-inclusive endocrinologist in New York City, explains how his approach to managing diabetes through blood sugar levels surprises new patients. He reports that many have internalized their diabetes as a personal failure, entering the office saying “I know, I need to lose weight,” and find it refreshing when Dodell does not use weight as a diabetes biometric.⁸⁹ When the health of large-bodied people is singularly understood as related to their BMI or their risk of developing NCDs, other aspects of their well-being are systematically overlooked (employment discrimination, inappropriate transportation and infrastructure, all-encompassing medical attention).

Challenging weight stigma through art⁹⁰

Mainstream and indie artists have used different formats to convey how sizeism intersects with gender and race in everyday life: from world-renown singers like Lizzo and Missy Elliot embracing large-bodied sensuality in “Tempo” to Yu’pik artist Amber Webb reclaiming traditional fats -like seal oil- from diet culture in her drawing “Midnight Snack 2”. Comics like “Weight of Expectation,” a piece that brings together the work of English sociologist Oli Williams and illustrator Jade Sarson, take the audience into the lived stigma associated with body size, weight, and shape.

Poetry is also a powerful platform: Argentinian poet Marianela Saavedra celebrates a “body that does not conform but invites” in “*Desobediente*” (Disobedient) while Rachel Wiley calls out how large bodies are constantly under public scrutiny in “For Nicholas who is so concerned”:

**“The elephant is very aware she is an elephant,
by nature she cannot forget this,
the room would never allow her to forget this,
so she may as well dance.”**

Women and BIPOC and LGBT communities face multiple and intertwined forms of discrimination. In this, weight-based identities merge with other racial, ethnic and gender identities creating intersections that can reinforce vulnerabilities and render individuals as undeserving of social, medical and political attention.

Weight stigma can itself lead to unhealthy weight-control practices, as well as other negative health consequences, including shame and guilt, anxiety, depression, and low self-esteem. Keith Norris observes that “weight bias also negatively affects access to obesity treatment, educational attainment, employment opportunities, wage gap, quality of health care and more ultimately leading to inequalities.”⁹¹ In a study conducted by Trainer and others, interviewees in North Georgia saw a clear correlation between being fat and expecting rejection by others, whether this be in occupational or romantic pursuits.⁹²

An analysis of the 2001-2002 and 2004-2005 National Survey of Alcohol and Related Conditions, showed on 21,357 adults categorized as overweight/obese that perceived weight discrimination was significantly associated with “increased risk for obesity-related chronic medical conditions even after adjusting for BMI, physical activity, and sociodemographic variables.”⁹³ Individuals who reported perceived weight discrimination also reported significant stressful life events in the past 12 months, and both variables were significantly associated with higher odds for diagnoses of arteriosclerosis, diabetes, and minor heart conditions.

Mental health regarding body size and body image poses a serious risk for children’s health and wellbeing. Weight-based stigmatization has a severe impact on children and youth, reproducing weight prejudices and normalizing hostile environments for young people.⁹⁴ Bullying and teasing, internalized weight stigma, anti-fat bias, and emotional distress are among the most common experiences faced by large-bodied youth. In an ethnographic account of Swedish female teenagers, large-bodied adolescents experienced a loss of symbolic capital as they were limited in their partaking of weight-centered conversation and physical proximity to them could relegate a thin peer’s social status.⁹⁵

Media messages glorifying thinness as an ideal and beauty standard results in levels of body dissatisfaction, a decrease in self-esteem and an increase in depression.⁹⁶ In Samoa, marketing images celebrating thinness have contributed to eating disorders among young women.⁹⁷ Social media has also created a space for the acceptance of different body types. Public figures like Lizzo have used social media platforms to showcase how they enjoy their bodies in different areas of life—and have gotten sometimes vitriolic pushback as a result. Other fat activists and influencers encourage movement and physical activity in a weight-positive atmosphere. Miriam Lara-Mejía, the Mexican fat activist and educator behind @lagordafeminista, encourages her growing community to enjoy different styles of movement and connect with their bodies through short pieces called “Bocadito de Movimiento” (Movement Bites). By reclaiming enjoyment, these activists also find empowerment and healing from weight stigma.



Obesity-prevention efforts aimed at children rarely address the experience of weight stigma. Peers are not the only source of stigmatization but also parents, family members, teachers, healthcare providers, and social media voices. The health risks of weight stigma among children and adolescents include “binge eating, social isolation, avoidance of health care services, decreased physical activity, and increased weight gain, which worsen obesity and create additional barriers to healthy behavior change.”⁹⁸

While other stigmas have been addressed through anti-discriminatory laws, weight stigma remains “legal” across the globe, despite the growing evidence of its repercussions. A study showed that support for policies and laws was high (over 90%) among adult participants enrolled in an international weight-management program and residing in Australia, Canada, France, Germany, the UK, and the US. In particular, support for policies focused on protecting

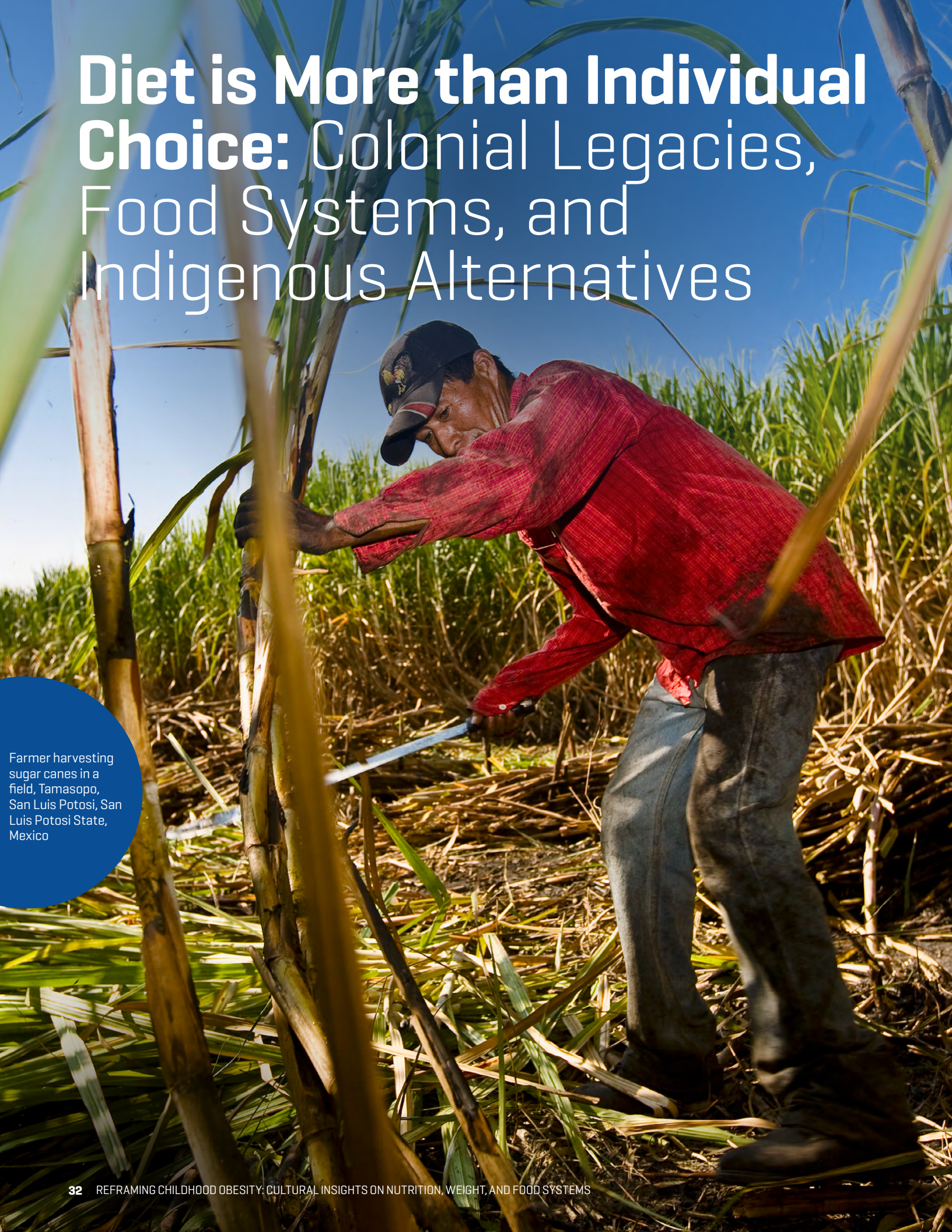
youth from weight-based bullying was overall positive.⁹⁹ The findings were overall consistent with other studies that have explored support for policies against weight stigma, though previous explorations have also found that support is higher among people who have experienced weight stigma or have higher BMI.¹⁰⁰

Brazil provides an example. While known for its high rates of cosmetic surgery, Brazil has a complex relationship with body size and ideals. Among Afro-Brazilians there is a comfort with, and preference for, larger body sizes, especially in women. In addition, as obesity rates have risen over the last twenty years, there has been a growing activism against fat bias (“gordofobia”). In Recife, for example, policymakers have devoted funds to making public transportation and medical care for accessible for large bodied people, and the history of weight discrimination is taught in the schools. Several Brazil states and municipalities have passed anti-fat discrimination ordinances, and a 2015 federal law extends protections to people with obesity and several states have passed their own anti-fat bias protections.¹⁰¹

Colonial legacies that link body size to moralities of discipline and self-control underwrite public health efforts that target diet and individual decision making. Recognizing how biomedical understandings of overweight and obesity are built on historically racialized and gendered notions of body ideals can help counter fat-bias and reveal structures that place BIPOC populations at higher health risk.



Diet is More than Individual Choice: Colonial Legacies, Food Systems, and Indigenous Alternatives

A full-page photograph of a farmer in a red shirt and cap harvesting sugar cane stalks with a machete in a field under a clear blue sky.

Farmer harvesting sugar canes in a field, Tamasopo, San Luis Potosi, San Luis Potosi State, Mexico

The efficiency of the modern global agro-industrial complex has resulted in a breathtaking diversity of choices in grocery stores, particularly in wealthy countries. In high- and middle-income settings, fruits, vegetables, and meats are readily available along with cheap and convenient ultra-processed foods. In resource-limited settings, packaged snacks, noodle meals, soups, and soft drinks are ubiquitous—often more easily available and cheaper than natural foods. This Anthropocene diet depends on global supply chains and intensive agriculture that come with steep environmental and health costs.¹⁰²

Rising consumption of cheap, convenient, and energy-dense ultra-processed foods is correlated with higher BMIs and poor health outcomes. A study of eighteen European countries found that the growth of ultra-processed food consumption is associated with higher obesity rates¹⁰³, and in a randomized control trial Kevin Hall and colleagues¹⁰⁴ found that ultra-processed foods were associated with higher caloric intake and weight gain. These foods are backed by large corporations with deep research and development budgets and far-reaching supply chains. They specialize in engineering foods to be cheap and hyper-palatable.

The conventional energy-balance framing of obesity and nutrition points to an overabundance of food, but too often overlooks how such food systems come to be and at what costs. The current widespread availability of ultra-processed foods and sodas (and the obesogenic environment in which they thrive) emerged from colonial histories of commerce. Recognizing the health effects associated with large body size as tied to structural racism and histories of colonialism is essential to achieving food justice and food sovereignty. Understanding how such patterns developed and became naturalized helps explain and address the systemic and structural conditions that produce current nutritional disparities.

In 2018, **67%** of U.S. children's calories came from ultra-processed foods

Using sugar as a primary example, this section shows how colonial legacies shape contemporary childhood nutrition and wellbeing. One aspect has been unequal patterns of trade and exclusion; another has been the segregation of domains of knowledge and a focus on individual choice and responsibility. In contrast, a decolonizing approach shifts the focus away from individual choice (and blame) and toward the underlying systems that produce certain outcomes. In this, we may view history as a social determinant of health.¹⁰⁵

Stanley Ulijaszek points out that the food and beverage industry has been effective at “promoting narrow epidemiological understandings of obesity [that] shift blame from foods to diet,” which is to say from structural and systemic factors to one of individual choices.¹⁰⁶ Below, we present a systems map of various factors that contribute to health outcomes related to nutrition and body size, including economic insecurity, time poverty, food marketing, and social media. Calling on Linda Tuhiwai Smith’s decolonization strategy of *reframing*, we then look to Indigenous approaches to food systems and wellbeing, which offer more holistic alternatives to individual-focused interventions.¹⁰⁷

Colonial legacies in food systems: Sugar

Ultra-processed foods comprise 57.9% of energy intake in U.S. diets, and contribute 89.7% of the energy intake from added sugars¹⁰⁸. By 2018, 67% of U.S. children’s calories came from ultra-processed foods.¹⁰⁹ Added sugar is present in 70% of processed foods, and children consume it in large amounts: 60% of infants and 98% of toddlers consume foods with added sugars¹¹⁰. These foods are engineered to tap into an innate affinity for sweetness, with sugar activating certain neural pathways for pleasure that likely evolved to store caloric rich foods. Fats trigger similar pathways for pleasure. Global rates of consumption for both sugar and fats increased dramatically between 1961 and 2011 (80% for fats, 20% for sugar), along with the rise in processed foods¹¹¹. There continues to be heated debate about the relative dangers posed by added sugars and fats,¹¹² but as part of the ultra-processed food complex, their impact is almost certainly detrimental. And both illustrate the ways colonial histories and corporate agricultural systems interact to produce certain weight and health outcomes. Here we will focus on sugar to illustrate how the process of diet colonization continues to this day.

Sugar production and consumption was a key feature of British colonial expansion and the Caribbean slave trade.¹¹³ Initially a coveted spice, the sugar market expanded to the middle and working classes in England in the eighteenth and nineteenth centuries. The mass production of sugar required a global trade system with humans as key commodities: enslaving Africans to be transported to Caribbean plantations and exporting sugar from those plantations to England, the U.S., and Europe. Sidney Mintz shows how sugar consumption was linked to factory labor: combined with tea or coffee it became what he memorably termed a “proletarian hunger killer” that also increased productivity. Marisa Wilson¹¹⁴ documents how the sugar industry in Greenock, Scotland (known as “Sugaropolis”) shaped the local people’s tastes, with working families incorporating the ingredient in different ways to their diet—especially children’s treats—that became central to Scottish life.

Amy Moran-Thomas¹¹⁵ describes how the global “sugar machine” has shaped the lives and landscape of people currently living with diabetes in Belize. Sugar is inscribed in Belizean Kriol as part of the terminology that expresses diabetic injuries: sugar foot, sweet blood, *sugar*. More than metaphorical synonyms, these words link current suffering to the colonial economy. The ancestors of those suffering from Type 2 diabetes came to be in Belize through the global slave trade. As sugar production moved to the area after the U.S. civil war, subsistence agriculture was largely replaced by imported goods. Sugar exploited Belizean bodies on plantations, not just through strenuous labor and physical punishments, but through the change in diet and lifestyle. The sugar plantation economy normalized disease and death among Black bodies. Now *sugar* is in the blood, urine, tears, and sweat of Belizean Garifuna, Kriol and Mayan bodies, and continues to harm and maim them through diabetes.

Growing up in New Iberia, Louisiana, James Doucet-Battle recalls his aunt feeding him sugar water.¹¹⁷ She explained that this was an Afro-Creole tradition that provided “energy”-energy needed to work in the sugar fields that defined the history of the region. As Moran-Thomas points out, sugar is many things: it can provide pleasure and comfort while also producing bodily harm and social suffering¹¹⁸. It is through the lens of sugar that we can grasp how the “far-reaching legacies” of colonialism still impact the lives of BIPOC people across the globe.

Anthony Ryan Hatch argues that sugar marketing and consumption is racially targeted in a way that kills African-Americans. His work calls for a metabolic emancipation from the substance and its structures, as he writes that “as elements of food regime organized through agricultural capitalism, the production and consumption of sugar have served to subordinate African Americans’ bodies.”¹¹⁶



“Sugar may be empty calories, but it is not an empty category”, explain Warin and Zivkovic as they follow the implementation of a nutritional intervention in disadvantaged communities in South Australia¹¹⁹. While the educational programs targeted sugar and fat as high-risk factors, they failed to understand how “unhealthy” foods like the trifle were a legacy of British colonization over peoples, land, and taste. As the nutritional recommendations targeted the popular desert by promoting a “healthier” version that locals could not afford (with fresh fruit, fat-free dairy, and less sugar), they inadvertently blamed low-income families for finding comfort and pleasure in a dish that had been part of the colonial taste repertoire that displaced local and indigenous foods but also became adapted to the cheapest and readiest ingredients available to many communities. The trifle, as well as other ultra-processed foods, had become a treat for families facing the hardship of poverty and displacement. Instead of targeting poverty, these interventions targeted people’s source of pleasure.

Corporate Interests, Children’s Health, and Metabolic Emancipation

African-American, Native American and low-income communities have higher rates of sugar consumption and Type 2 diabetes than the general population, and they have been particular targets of marketing campaigns for fast food and processed foods.¹²⁰ In part, this can be linked to sugar companies’ successful campaign sponsoring studies to argue that fat, not sugar, is the singular health threat. But it is also related to racial geographies of food access, targeted marketing campaigns, and structural inequalities.

In an ongoing process of colonization of diets, local foods get crowded out, and replaced by processed alternatives. Diana Burnet explains how the practices of transnational food companies “destabilize local food cultures, erode the protective health factors of seasonal and local consumption, and promote participation in the normativity of Euro-American foods and patterns”.¹²¹ In communities experiencing both economic poverty and time poverty, fast food companies market specifically to appeal to children from an early age. Companies market sugary and fatty foods in communities where time and money are in low supply and crowd out other more nutritious options. In *Hooked*, Michael Moss describes this phenomenon in the U.S., and outlines the case for fast food as an addiction, like alcohol or drugs, out of personal control.

“Not a single one of these foods represents a cultural high point in sensory pleasure. These foods are about quantity. That’s why they feature verbiage such as *double, triple, ultra, super, and dream*. They are the eating equivalent of loss chasing. No matter what any scientist tells you, these foods are not “hyperpalatable.” They do not represent the apex of eating pleasure. They just seem that way to people caught in the grip of “wanting.” What they are is “**hypercraveable**.”

Mark Schatzker¹²²

Many Native American communities in the United States face food insecurity and poor nutritional outcomes as a direct result of settler colonialism. Reservations often have limited access to grocery stores, and hunting restrictions limit traditional sources of protein.^{123, 124} As Indigenous communities were forced off their ancestral land and into reservations and boarding schools, traditional food practices were systematically stripped away. Many communities living on reservations struggle with poverty, generations of trauma, and assorted health risk factors, like substance abuse, diabetes, kidney disease, and heart disease. Colonized diets have become “traditional,” as with fry bread, and for most processed foods are the cheapest and more reliable option.

Colonial patterns of exploitation and exclusion perpetuate today, as food industries capitalize on the poverty of low-income communities. Easy access to convenient, cheap foods shifts consumption from healthier, traditional foods to ultra-processed diets in communities living with economic and time poverty. The inequities along class and race lines in high-income countries like the U.S. are striking (for youth 2-19, 16.1% of whites, 8.7% of non-Hispanic Asian youth, 24.2% of Black youth, and 25.6% of Hispanic youth are classified as living with obesity)¹²⁵. Heather Howard studied how Canadian residential school life affected Indigenous children’s relationship with food and management of diabetes as adults.¹²⁶ Food played a role in “the regimentation, discipline, punishment, morality, deprivation, and even sexual abuse” in these schools, producing intergenerational trauma. An effective strategy for diabetes intervention in this context was acknowledging the historical trauma and resilience of children survivors, and building new relationships with Indigenous foods through culturally relevant practices like storytelling and eating together.

Ashanté Reese on Food Redlining

In Black Food Geographies: Race, Self-reliance, and Food Access in Washington, DC, Reese describes what she calls “food redlining” to call attention to the point that food access was systematically kept away from Black neighborhoods.¹²⁷

Reese tells the stories of individual residents in the Deanwood community to show how food is political, and that food systems intentionally and disproportionately impact urban, low-income Black communities. Reese highlights resilient Black subjects fighting for change within a system designed to perpetuate health inequity.

The consumption of ultra-processed foods increases calorie intake and body weight, likely due to calorie density, taste craving, and ease of consumption.¹²⁸ Not only does marketing and availability play a role in the widespread consumption of processed foods, consumer concerns about food safety in low- and middle-income settings can reduce consumption of fresh foods.¹²⁹ The processing of food itself, which serves to make food cheap, tasty, and addictive, actively strips out nutrients while adding fats, sugars, and salts.¹³⁰ Processed foods often contain ingredients that trick brains into perceiving a false nutritional benefit and stimulate cravings. In *The End of Craving*, Mark Schatzker recommends prohibiting such use of ingredients to manipulate craving.¹³¹ Soledad Barruti points out that it's not only about what the children are eating, but also what they're *not* eating.¹³² Early experiences with sugary foods, like yogurt, packaged candy, and fast-food lead children to prefer sugary and fatty foods over vegetables and fruits.¹³³ Processed foods thus crowd out natural alternatives.

A 2021 study by *The Guardian* and Food and Water Watch looked at offerings in U.S. grocery stores and found that for 85% of the products, four firms or fewer controlled more than 40% of the market share.¹³⁴ Their investigation found that a few powerful transnational companies dominate almost every link of the food supply chain, “from seeds and fertilizers to slaughterhouses and supermarkets to cereals and beers.” The concentration of market power in a few firms has been accelerated by mergers and acquisitions, deregulation, and lobbying. It has also significantly reduced the power of those who harvest, slaughter, pack, and sell food. Nor are small farmers making out well: on 15% of supermarket prices go to farmers. The ETC Group reports that four companies control more than 50% of sales in a range of key agricultural inputs (seeds, agrochemicals, livestock genetics).¹³⁵

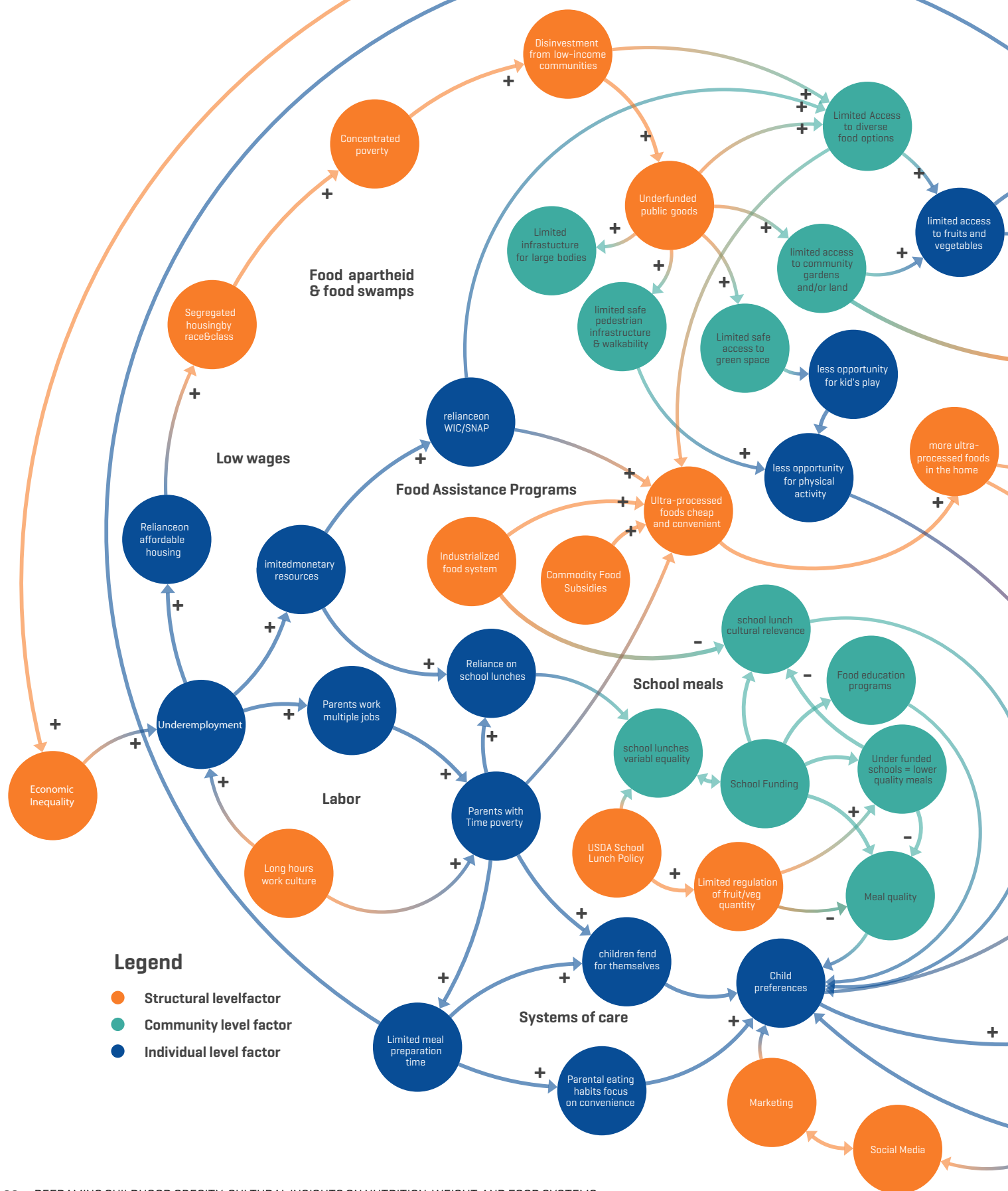
Taxes and labeling regulations have been implemented in a number of countries and cities around the world with varying degrees of success. Chile's 2016 Law of Food Labeling and Advertising was the first national regulation to mandate prominent front-of-package warning labels, restrict child-directed marketing, and ban sales in schools of all foods and beverages containing added sugars, sodium, and saturated fats. Studies have shown a 23.7% decline in sugary beverages across socio-economic classes.¹³⁶

A systems approach to food, body size, and childhood health

Body size, nutrition, and health risks are situated within a complex framework of drivers that extend beyond the individual. Access to healthy food, time to prepare it, and time to move and exercise, are often luxuries of the middle and upper classes. Those with fewer resources have to make tough choices. One approach is to focus on those choices as individual decisions. But here we focus on the structural and socio-cultural factors framing choices. This shifts our perspective away from individual decisions (and blame) and toward the underlying drivers of a system that produces certain outcomes.¹³⁷

In taking a systems approach, we look at how current infrastructure, economic disparities, environmental conditions, models of care, time-poverty, weight stigma, and other factors help reproduce racial and gendered inequalities in relation to child health and nutrition. This work builds on other systems maps, such as the UK's 2007 Foresight Programme Obesity Systems Map (which emphasizes an energy-balance model)¹³⁸, and the 2019 Lancet Report on “The Global Syndemic of Obesity, Undernutrition, and Climate Change,” which presented four different systems (macro, meso, micro, and governance) and five loops (health, governance, business, supply and demand, and ecological).¹³⁹ Our effort does not assume that the only area approachable by public policy is individual behavior¹⁴⁰, and we learn from community-focused mapping efforts around childhood obesity.¹⁴¹

Hanes Motesinger and a team at Vanderbilt's social innovation center developed the following systems map¹⁴² of the interacting social, economic, political, environmental, and cultural contexts that predispose certain children in the United States to nutritional and weight-related health risks. The systems map is intended to illustrate areas in which policies can resolve some of the underlying circumstances that continue to place certain children at risk. Our effort extends the systems work of the National Academies' Roundtable on Obesity Solutions in shifting the focus from individual behavior to the complexity of power relations at different levels of social interaction.¹⁴³ They call for prioritizing three areas of action: structural racism, mental bias, and social norms, and health communication.



The CCH Systems Map

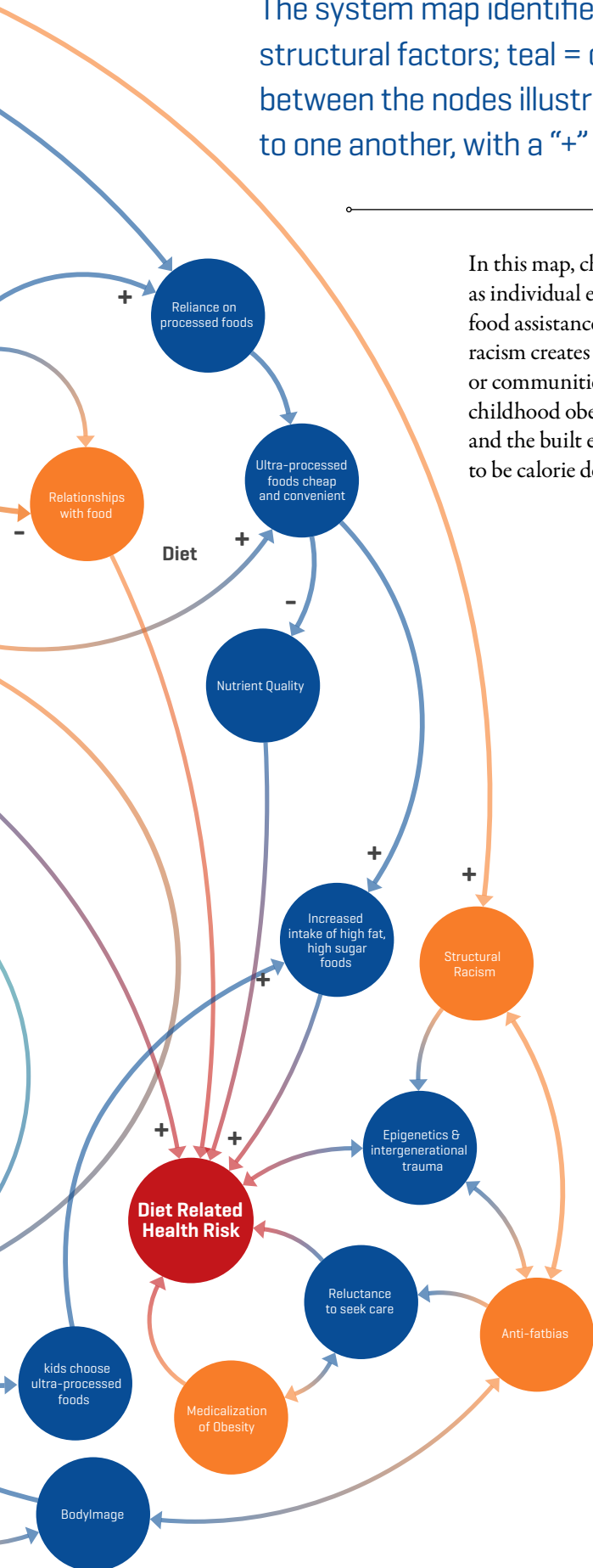
The system map identifies color codes key variables: orange = systematic/structural factors; teal = community factors; blue = individual factors. Arrows between the nodes illustrate how different factors in the system are connected to one another, with a “+” or “-” denoting a positive or negative feedback loop.

In this map, children’s nutritional health risks are framed by clusters of variables such as individual economic responsibility, systems of care, commercial environment, food assistance, and anti-fat bias. Across the entire system, structural inequality and racism creates an environment wherein youth from low-income communities and/or communities of color are more likely to experience increased risks of living with childhood obesity. Low wages, long work hours, school food programs, food apartheid, and the built environment all interact in different ways to create diets that are more likely to be calorie dense and nutrient poor:

- Children of parents working multiple jobs or long hours are often left to fend for themselves for food, creating an environment wherein they are more likely to choose convenience foods which are less healthy due to the industrialization of the food system.
- Low-income families are often dependent on food assistance programs that incentivize consumption of processed foods because they are more affordable and/or shelf stable
- Low-income communities generally have limited access to green space for leisure or gardening, which has a negative impact on opportunities for physical activity.
- The industrialization of the food system diminishes traditional foodways, meaning that youth from different ethnic or cultural backgrounds do not have access to culturally relevant foods

A systems approach requires assessing vulnerabilities, and David Napier and colleagues have developed a protocol that documents “the combined effects on individual lives of social and environmental stressors; service use patterns and barriers; community structures; networks and adaptations (forms of social and cultural ‘capital’) and barriers to human agency and to social and cultural inclusion (vulnerability indicators).”¹⁴⁴ Grounding systems mapping with such assessments of local dynamics can provide insights to inform long-term and sustainable interventions.

The Roundtable on Obesity Solutions also recognizes the need for systems thinking to overcome silo-ed and discipline-specific approaches. Similarly, the Oxford Unit on Biocultural Variation and Obesity recommends working on three levels of systems at once: micro (individual choice and behavior and structural contexts), meso (socio-economic differences, stigma), and macro (the globalized food system and obesogenic environment).¹⁴⁵ But, a systems approach is often difficult to implement because of entrenched conceptual and policy silos (agriculture, education, taxes, etc.). These can thwart the sort of integrated response that is needed.



Amsterdam has developed what is perhaps the best example of an integrated approach to children's nutrition and health. Based in a children's rights framework, the Amsterdam Healthy Weight Approach (AHWA)¹⁴⁷ is described as a "20 year marathon" (2013-2033) with the goal to reduce overweight and obesity rates of children in Amsterdam to the national average, and to make Amsterdam one of the top five healthiest European cities, by 2033. By 2018, the goal is for children 0-5 years old to have a healthy weight in Amsterdam; by 2023, for a healthy weight for 0-10-year-olds in Amsterdam; and by 2033 for all young people in Amsterdam to have a healthy weight. a healthy weight for all young people in Amsterdam. The AHWA was created with a whole-system approach and encourages the cooperation of city-level program management, local and federal policymakers, health professionals, and community support groups. City and national governments are encouraged to condemn media platforms and publishers which provide misleading marketing information about the consumption of unhealthy foods. Furthermore, through adaptive cluster programs, AHWA strives to partner with the pre-existing national Equitable Start Program, Jump-in program, and Health City Program to implement nutritional education in school-based environments, prioritizing a child's rights lenses to equitably reach all children. Furthermore, the program partners with local food entrepreneurs on issues ranging from healthy business operations to portion sizes. In keeping with the marathon metaphor, AHWA advocates for a reasonably paced run towards healthy living, rather than a sprint to lose weight. By encouraging people to walk more, provide individual support to family, and creating close circles of care, AHWA provides the tools for sustainable healthy lifestyle, where weight loss is a primary but not the only goal.

Another take towards systems approach can be found in the 2021 Toronto Black Food Sovereignty Plan.¹⁴⁸ The 5-year plan was designed in collaboration between the city, community-based organizations, and local universities, and it focuses on Toronto's diverse Black population who face chronic food insecurity (36.6% of Black children live in food-insecure households).¹⁴⁹ The policy identifies five structural challenges to food security and health for black communities which not only include key aspects of food insecurity (like food apartheid, access to infrastructure

or green spaces) but also places structural racism in health systems and funding at the forefront of the issues. In order to build food and health systems with "anti-Black racism and an Afro-centered lens", the plan follows a food sovereignty approach that acknowledges the human right to food and the UN International Decade for People of African Descent. The plan outlines five pillars of intervention (Sustainable Funding & Community Capacity; Building Access to Growing Space; Accessible Infrastructure; Black Food Hubs and Cultural Markets; and Culturally Rooted Community Health & Nutrition Programs) and 45 specific actions. In this sense, the food sovereignty framework helps bring light into the system and centers its efforts in "the decision-making power of people to define how to access their culturally appropriate foods".¹⁵⁰

Reframing nutrition: systems thinking and Indigenous foodways

A systems approach reveals the complexity of issues as well as the importance of placing structural matters at the forefront of health initiatives. In this, it is important to understand the historical processes that have produced structures that drive different health outcomes for different peoples. We can draw lessons from Indigenous food systems to imagine what a decolonized, systems-based nutrition movement might look like. We call for a broader view of the "obesity problem" that de-centers the role of the individual and instead places all of us in a network with one another, a network that we must recognize is created to value and uplift white, wealthy bodies.

Many Indigenous knowledge systems are more attuned to a systems approach than traditional disciplinary silos allow. Many start from an understanding that all aspects of life—human and non-human—are interrelated and thus configure our being. For our purposes, this is a recognition that food is more than nutrition and that health challenges are best faced collectively. Indigenous knowledge and systems have been subject to different colonial powers across the world but have resisted also in different ways and are being reclaimed in many ways.¹⁵¹ Indigenous systems thinking inspired the approach of Rupa Marya and Raj Patel (2021) that seeks to overcome colonial legacies that place individual over collective wellbeing while also detaching the physical from the spiritual in medical knowledge.¹⁵²

The Cities Changing Diabetes program in Copenhagen facilitates vertical and horizontal integration of programs. Paul Bloch explains that they believe that "impact is only achievable in long-term interventions, not through discrete projects." They coordinate with all stakeholders, and move beyond just the front-line workers to incorporate policy makers and administrators from the municipality, schools, and nurseries.¹⁴⁶

“Colonization forced out the practice of our religion, which is linked to all our prayers, which is linked to the way that we grow food, which is linked to the way that we actually bring our children up, which is linked to the way that we interact with each other. This damaged the ability for Māori to be Māori and we are feeling the impacts of it today.”



Mapihi Raharuhi,
Māori Lakes
District Health, NZ¹⁵⁷

Reframing nutrition through Indigenous systems thinking places foodways in the center stage of health, but also allows us to embrace a broader scope of well-being. As Elizabeth Hoover explains, the disruption of self-determination was a key function of colonialism and it implied the deliberate disruption of indigenous foodways. Colonization not only diminished their wellbeing in a biological sense but disrupted their cultural health by severing their ties to their nation, land, and spirituality. Today, many peoples and projects advancing Native American foodways embrace the call for Indigenous food sovereignty as a way to heal not just the individual body but also “other aspects of health (cultural, spiritual and social) that are enmeshed in traditional food systems.”¹⁵³

Among the Apsáalooke (Crow) people in Montana, food insecurity is a pressing issue. In 2019, the last grocery store on the reservation burned down, and there are conservation restrictions on ancestral hunting grounds. Peggy White Well Known Buffalo and the non-profit Center Pole are rebuilding traditional food systems by providing the knowledge and land for people to garden traditional foods.¹⁵⁴ She frames this work as a project of food sovereignty, the right of a community to identify its own food systems. Another interesting approach can be found in the Zuni Youth Enrichment Project in the Ho’n A:wán Community in New Mexico.¹⁵⁵ Concerned over health outcomes associated with obesity, the program focuses its efforts on aspects of Zuni culture and traditions that can sustain healthy childhoods. A 2.5-acre park was designed in collaboration with Zuni elders, leaders, and young people to ensure that cultural values were embedded in the layout and activities. The program takes a holistic approach that looks beyond just lowering body sizes by teaching cooking and gardening skills and offering organized sports and free play for the youth population.

A broader understanding of health and foodways can also help reframe the possible solutions for childhood nutrition. Ihirangi Heke and colleagues explore how Māori indigenous systems centers on connections, not individuals, by addressing how Western-defined problems such as childhood

obesity cannot be understood separately from Mātauranga Māori (an understanding of the universe composed of connections between animate and inanimate entities, plus events, time and ideas) and Waiora (physical, psychological, and spiritual wellbeing).¹⁵⁶ The reframing places people’s relationship to food into a larger scope that includes reclaiming and teaching Māori worldviews that pertain not only to foodways but to environmental knowledge, tribal belonging, and local knowledge. In this way, efforts are drawn beyond individual blame and even community blame.

Mapihi Raharuhi, a former leader of the Healthy Families Rotorua project in New Zealand, explains that Maramataka (“Māori systems thinking”) is an epistemology that places interconnection between past, present and future, and overrides the knowledge silos that come with western science. The Rotorua project uses Maramataka in programs to reduce obesity by encouraging people to return to a healthy lifestyle, including community gardens. A starting point for children’s health interventions is that “a child belongs to the tribe.” Māori understanding of tribal belonging has the potential of looking beyond individual health risks and placing a concern over the collective. Acknowledging a collective existence beyond the individual highlights that structural change is needed to improve equity of access and health outcomes. The Rotorua project used this approach to address food systems—how familial relations and knowledge play a role in communicating not just nutritional values but systems of care—in relation to their understanding of children’s role in a community.

There is no one silver bullet to solve the health problems associated with obesity. But in order to achieve nutritional equity in communities that have been systematically marginalized we have to have policies that address legacies of colonization and the realities of structural racism. While a growing number of interventions emphasize the systemic aspects of obesity, they rarely address the ingrained health risks of our current economic models and the responsibility of the global food industry.

Recommendations¹⁵⁸

The most effective and sustainable efforts to improve child nutrition and health take into account cultural contexts and colonial legacies as well as nutritional science. Based on the evidence presented in this report, we make the following recommendations:

1. Food is more than nutrition

1.1 Rather than focusing on particular nutrients, acknowledge food as embedded in cultural contexts, allowing for creative adaptation to local circumstances.

Rationale: Food choices are shaped by cultural preferences as well as social and economic constraints. Understanding the complex relations between identity, traditions of taste, and eating practices can better inform health policy on nutrition and weight.

- Ground nutritional programs in social search around culturally-driven values.
- Support efforts to make available culturally-relevant, nutritious foods in BIPOC communities.

1.2 Limit marketing of ultra-processed foods to children.

Rationale: Children have the right to receive balanced information important to their health and well-being and to protection from harmful practices that take advantage of them. The link between social media, marketing, and ultra-processed foods creates an obesogenic environment for young people, particularly BIPOC children.

- Regulate food-based advertising directed at children across media platforms.
- Develop multi-sectoral alliances to restrict harmful food marketing content for children.

1.3 Understand and build on cultural dynamics around children's food, engaging youth through policy dialogue and school lunch programs.

Rationale: Culture is often viewed as an obstacle to public health, something to be overcome to improve outcomes. But just as food and beverage companies effectively work with cultural dynamics, so too can health programs build on local values.

- Launch public health campaigns to reclaim "children's food" from companies and reframe them as part of what we should all be eating.
- Engage communities and youth to explore food dynamics through school gardens and lunch programs.

2. Health is more than weight

2.1 In clinical care and population studies, avoid reducing children classified as overweight or obese to this single aspect of their health. Too often children and their parents are blamed for a lack of responsibility regarding health problems associated with large body size. Interventions centered on weight-loss through individual diet and behavior can inadvertently lead to shame and stigma.

Rationale: Racial, ethnic, gender, and class-based biases play into the history of biometric approaches to the health risks of weight and can result in stigmatization. Rarely are large-bodied children and adults involved in policymaking that target weight as a public health concern.

- Bring in marginalized voices, including those living in large bodies and youth, to understand the contexts and challenges facing them.
- Use an intersectional approach to define, diagnose and address health, illness and weight.

2.2 Actively fight anti-fat bias and shaming, acknowledging that weight stigma and discrimination place youth in vulnerable conditions.

Rationale: Fat shaming and weight-bias exacerbate health risks and cause emotional damage. This can result in distrust and rejection of medical advice. Weight bias in health services may result in perceiving large-bodied patients as non-compliant.

- Avoid fat-shaming, even “constructively,” especially with children.
- Include education about the impact of weight bias and fat-shaming on children and adults’ health in medical school curriculum.

2.3 Acknowledge the limits of BMI in assessing individual risk, treating it as one risk factor among others.

Rationale: BMI is a poor predictor of individual metabolic health.

- Adopt frameworks that de-emphasize BMI in favor of more precise measures such as blood pressure, glucose, and cholesterol levels.
- Avoid generic weight loss recommendations that might result in further health risk (eating disorders, mental health issues, stigmatization).

3. Beyond Individual Choice

3.1 Address the responsibility of global food systems as key drivers of nutritional health, as well as their role in producing cheap ultra-processed foods.

Rationale: The food industry has contributed to the growth of ultra-processed foods at the expense of nutrient-dense and culturally relevant foods.

- Implement regulations and taxes that tackle corporate responsibility in food production and distribution, particularly regarding added sugars in ultra-processed foods marketed to children.
- Acknowledge the historical legacies that frame food and health vulnerabilities.

3.2 Integrate policy silos to deal with interdependent political, commercial, and cultural systems that produce inequalities associated with poor nutrition.

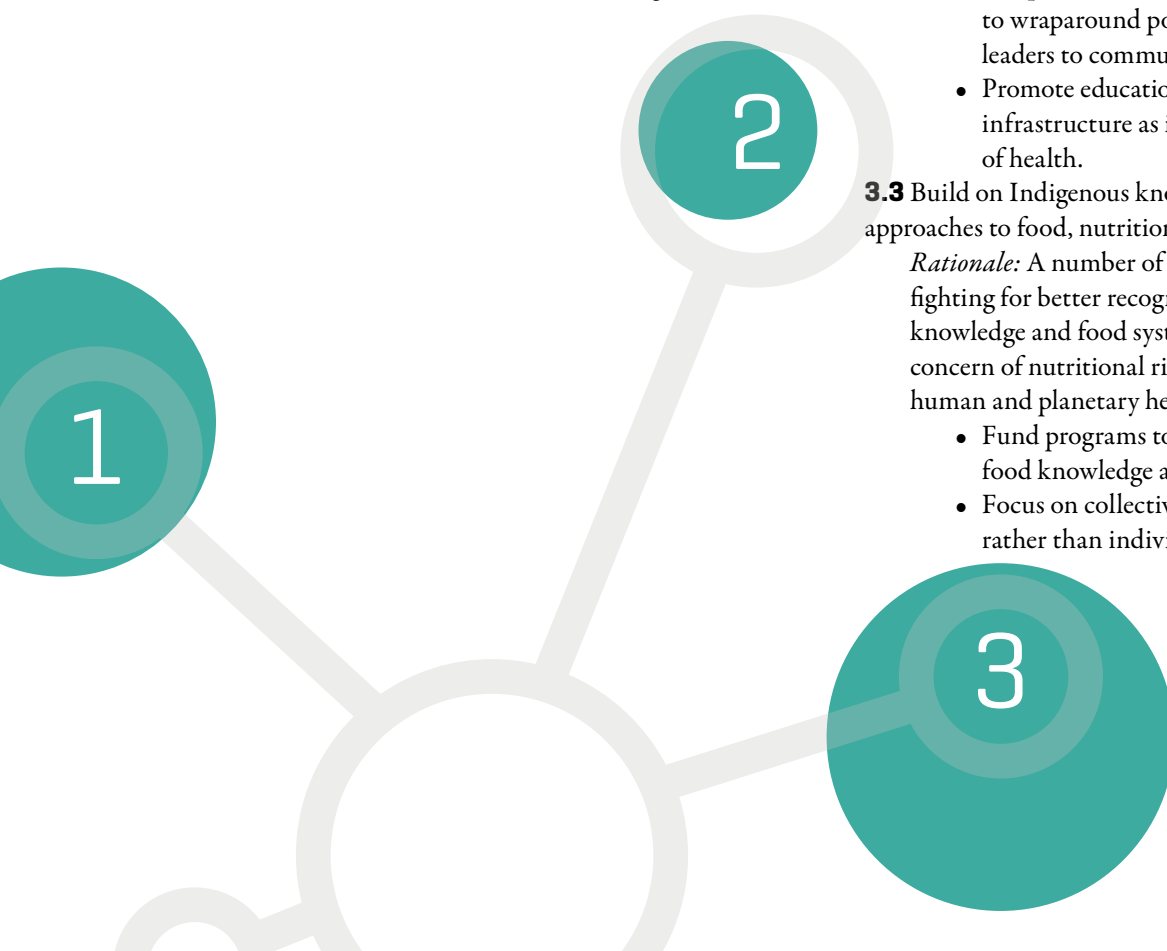
Rationale: Economic, social, and psychological insecurity during childhood lead to nutritional health risks in adolescence and early adult life. Integrating systems thinking and intersectionality helps identify the multiple drivers of childhood obesity and health.

- Adopt “Health in All Policies” approaches to wraparound policies and a network for leaders to communicate with one another.
- Promote education, access to food, and public infrastructure as important social determinant of health.

3.3 Build on Indigenous knowledge and holistic approaches to food, nutrition, community, and health.

Rationale: A number of Indigenous communities are fighting for better recognition of their food knowledge and food systems, which reframe the concern of nutritional risks to one that addresses human and planetary health.

- Fund programs to reinvigorate traditional food knowledge and systems.
- Focus on collective and community solutions rather than individual behavior



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