

AMA Journal of Ethics®

October 2018

Volume 20, Number 10: E911-1000

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FROM THE EDITOR

The Ethics of Food in the Health System Architecture

Jessica Fanzo, PhD

Food holds a special place in global societies, and its meaning and value are embedded in our cultures and our economies. We all need food for our survival, health, and overall well-being, which is one reason why it is considered a human right by the United Nations (UN).¹

The foods we eat that make up our diets come from food systems. These systems comprise all the elements (eg, environment, people, inputs, processes, infrastructures, institutions) and activities that relate to the production, processing, distribution, preparation, and consumption of food and to the output of these activities, including socioeconomic and environmental outcomes.²

While food systems in some countries are incredibly efficient and offer consumers more diverse foods than ever before, they are also rapidly changing, sometimes for the worse. The diets resulting from inefficient food systems are now one of the major risk factors in the global burden of disease. This is quite apparent when one looks at malnutrition statistics. Approximately 800 million people are undernourished in the world; 155 million of the world's children under the age of 5 (23%) are stunted or chronically undernourished,^{3,4} and another 2.1 billion people are overweight or obese.⁵

By 2050, the global population is expected to reach between 9.4 and 10.2 billion people,⁶ increasing the demand for food and creating unprecedented stresses on the environment, natural resources, and ecosystems that humans are intricately dependent upon. Yet the global food system is already straining ecosystems and landscapes that are essential for our food supply and diets. Food production is the major emitter of greenhouse gases to our atmosphere as well as the largest user of water resources.⁷ With rapid urbanization, population pressures, geopolitical conflicts, fragile global democracy, and less predictable climate variability and more extreme weather events, the stakes are too high to ignore the influence of the global food system on the environment and vice versa. Underlying this challenge is the unanswered question of how to nourish our populated planet in ways congruent with positive social, health, environmental, and economic outcomes. We need a more equitable, ethical, and sustainable global food system.

The debate about feeding the world *well* and sustainably is deeply rooted in ethics. At its core, this debate engages a range of compelling ethical values—promoting individual and public health, protecting the environment, ensuring economic well-being, minimizing animal suffering, providing fair access to farmland, respecting individual freedoms and cultural traditions, fostering collective control over food and agricultural policy, engaging an active citizenry in food social movements—that frequently come into conflict in the formulation of potential solutions. At the same time, the burdens of undernutrition and overweight and obesity—and of climate change and environmental degradation—fall disproportionately on the world’s most disadvantaged people and groups, including poor women and children and the rural and urban poor.² Such complex issues underscore the need to pay careful attention to the ethics of the current state of the global food system and of proposals to improve it, as well as to the need to articulate the broader ethical landscape.

This special issue of the *AMA Journal of Ethics* examines the complexities of an array of food system ethical issues and their impact on health and nutrition outcomes. This issue also examines the nature and scope of clinicians’, organizations’, industries’, and governments’ obligations to address these ethical issues.

The health sector and the practitioners working in that sector are at the center of many ethical issues stemming from food systems and their interactions with health systems. Physicians are faced every day with such ethical issues. Many farm and food system workers suffer from work-related injuries and illnesses related to agriculture and food supply chain work. Nicole Civita argues that physicians must be equipped to deal with the unique challenges of this population and to understand the complex risks that patients from this population face. Toward this end, clinicians need to make site visits, viable treatment recommendations, and [advocate for reform](#).

These patients could be seen as vulnerable, but Alexis K. Walker and Elizabeth L. Fox re-evaluate [what it means to be vulnerable](#) across the global food system. Traditionally, women of reproductive age and children were considered nutritionally vulnerable because of the unique stage of their lifecycle both biologically and physiologically.² However, the authors argue that classifying who is vulnerable can be problematic and that a more nuanced view of contexts of marginalization across food systems is critical for successful dietary and nutrition interventions.

While mothers with low income are often considered one of the most vulnerable groups, we need to take a closer look at how mothers make dietary decisions. Anne Barnhill and Stephanie Morain highlight the importance of one of the most important natural foods we have to offer—breastmilk. Eliminating [formula giveaways](#) has been embraced as a way to reduce the influence of formula marketing in hospitals and to increase breastfeeding rates among new mothers. However, the authors argue that this practice

can raise some ethical concerns about autonomy for those mothers who, for lifestyle reasons, prefer to feed formula to their infants and who cannot afford formula without the giveaways.

Health care professionals are also dealing with populations with multiple burdens of malnutrition related to transitioning food systems and nutrition transitions, as Adam Drewnowski and Jean-Pierre Poulain point out. They examine how cultural factors can provide insights into the “[protein transition](#)”—the choice of populations’ protein that economic factors alone cannot illuminate. Thus, health care professionals have a complex patient population to deal with, as individuals sometimes face multiple health burdens, including food insecurity and obesity.

Obesity is stigmatized not only in society but also within the health system itself, which can influence patient care. Often, medical students trained in the United States are biased towards thinness, as Gail Geller and Paul A. Watkins point out. They show that a sizeable minority of students in their study attributed obesity to being lazy or lacking will power and argue that medical schools should integrate ethics into the nutrition curricula to help mitigate [negative weight bias](#). Part of the education of health care professionals also means better understanding of nutritional science itself. David L. Katz argues that physicians need to be better informed about [nutritional sciences](#), a unique, complex, difficult-to-study field. In order to help patients make informed decisions, physicians need to share the limitations of the evidence with their patients and to partner more effectively with dietitians and nutrition experts.

There are many ways to improve food systems to improve diets. Many nutrient-rich foods are expensive or inaccessible in food deserts. Annalynn Skipper argues that while both consumers and physicians face time constraints, physicians can play an important role in promoting healthy diets to their patients with low income through advocacy. In particular, she argues that they should become advocates for making nutritious foods easy to get and consume and not shy away from what could be seen as a daunting task to [end food deserts](#). Haley Swartz looks at fruit and vegetable [produce prescription programs](#) that are meant to deliver healthy foods to people with low income. She conducted a literature review of community-supported agriculture, vouchers, and coupons and found that when physicians and retail outlets offer these programs there is a need to assess autonomy and fairness from the perspective of patients as well as to address barriers to the programs’ expansion. Sarah Reinhardt and Ricardo Salvador argue that physicians can contribute to a more equitable and sustainable food system by advocating for and participating in [food procurement initiatives](#) that are consistent with providers’ health-promoting missions. Finally, in the podcast, 1 and 2 of the contributors to this issue—Swartz and Katz—will explore concrete strategies for clinicians who want to address food scarcity or poor nutrition in the communities they serve.

Actions need to go beyond those taken by health care and food system actors. There is a need for global action and accountability. As I suggest in my contribution to this issue, the [Sustainable Development Goals](#) (SDG) era is upon us, which requires global cooperation. We must focus our attention on SDG2 being central to the food systems agenda—which is to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture”⁸—and, in so doing, many of the ethical issues of social equity and justice across food systems will have to be addressed. Governments, the UN, international and local nongovernmental and civil society organizations, the food and beverage industry, and health professionals all play a role and are accountable in ensuring that the nutrition and health needs of our global population are met through food systems.

This issue of the *AMA Journal of Ethics* aims to help highlight the ethical issues of food systems in the health of populations and how health care and health practitioners can play important roles.

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Citation

AMA J Ethics. 2018;20(10):E913-917.

DOI

10.1001/amajethics.2018.913.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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ISSN 2376-6980**

CASE AND COMMENTARY

How Should Physicians Counsel Patients Who Live in Food Deserts?

Annalynn Skipper, PhD, RDN

Abstract

In this case, a physician wonders what he should do to help make nutrient-dense foods available in underserved neighborhoods. I argue that improving diets of people who live in food deserts is a complex problem at the intersection of culture, education, and economics that will require community partnerships and clinician self-education to solve.

Case

At a community meeting, Dr D presented his research on physician attitudes toward and work habits in food deserts and the obstacles that prevent physicians from promoting nutritious diets to patients with low income. Dr D found that physicians have limited training in foods, nutrition, and behavior change counseling, all of which are poorly reimbursed by insurance companies and Medicaid. At the end of the presentation, a local advocate for community services who wanted to eliminate food deserts by building full-service grocery stores asked, "In this day of limited availability of healthy foods and not enough resources to buy them, shouldn't insurance companies, food banks, and physicians do more to ensure that nutritious food is available in our underserved communities?"

On the way home that evening, Dr D thought about differences in foods available in the communities where he lived and worked. Near his home, there were 3 large, brightly-lit stores with the word "fresh" as a part of their name. These stores were well stocked with an array of produce, whole-grain breads and cereals, freshly prepared foods, and even junk food items cleverly packaged to appear nutritious. They stood in sharp contrast to nameless stores with security gate entrances near the medical center where he worked. In these small stores, aisles were crowded with sugar-sweetened beverages, high-fat sugary snacks, high-sodium convenience foods, and the occasional bunch of overripe fruit or limp vegetables. Given that markets typically reflect consumer demand, Dr D began to think that food availability might be one facet of a more complex problem. Did his patients know what they should eat?

As Dr D thought about the patients in his practice, he recalled early attempts to improve his patients' knowledge—and ultimately their consumption—of nutritious foods. Dr D came to realize, however, that counseling patients was impractical because counseling

must be continued for months to achieve positive behavior changes. Extending appointments to provide counseling decreased the number of patients he could see, impairing his productivity and ultimately the revenue he contributed to his group practice. Besides, many of his patients had deferred medical care of equal if not greater priority than dietary changes. Most of his patients worked more than one job to support their families, and few of them had resources to pursue something as ethereal as their long-term health.

Dr D also realized his own preference for a mostly Mediterranean diet differed from the diets preferred by many of his patients, some of whom were unfamiliar with or perhaps even wary of foods he recommended. Dr D wondered whether foods he consumed really were more nutritious than foods consumed by many of his patients. He came to understand that foods patients viewed as traditional—regardless of nutrient density—can be important simply because they can serve as cultural and community touchstones. As a result, Dr D has become more humble about attempting to steer patients away from some foods in case doing so might be interpreted as disrespectful of food preferences driven by cultural practices.

Dr D now wonders, *Given these experiences and what I've learned over the years about counseling and the cultural importance of food practices, what should I as a physician do to improve availability and consumption of nutritious foods among patients in communities near the medical center?*

Commentary

In this case, Dr D appears to have met his ethical duty to advance knowledge¹ by sharing his research findings about physician attitudes toward and work habits in food deserts. As Dr D might suspect, however, he is likely expected to do more. In fact, the American Medical Association (AMA) *Code of Medical Ethics* specifies in Opinion 8.11 that physicians should [promote healthy communities](#) while “balancing a commitment to individual patients with the health of the public.”² If improving consumption of nutritious foods would improve the health of a community, advocating for greater availability of more nutritious food would be one way to fulfill such a responsibility. To balance his commitment to individual patients with his public health duties, Dr D counsels his patients on nutritional health and also considers a suitable community health initiative.

In the Clinic

Since Dr D learned that respecting cultural traditions could enhance the patient-clinician relationship, he now resists asking about specific foods that have cultural importance even when he considered them unhealthy. In Dr D's experience, many of his patients want to eat as well as possible. Their families are no different than families at other income levels: they also make choices every day about the convenience, quality, and taste of the foods they eat.

Dr D had implemented a “collaborative, patient-centered” approach to care of his patients to promote trust and to recognize patients’ “self-directed roles” in maintaining their health, as recommended in Opinion 8.11 of the *AMA Code*.² He devised this approach in order to be respectful of patients’ cultural traditions, consistent with Opinion 1.1.3 of the *AMA Code*, which states that patients are entitled to respectful communications from their physicians.³ Since he had not been trained in foods and nutrition, Dr D decided, in accordance with Opinion 10.5 of the *AMA Code*, that he would “delegate to an appropriately trained allied health professional”⁴ responsibility for developing or selecting a nutrition resource list for patients, providing some culturally appropriate nutrition materials that the medical assistants could distribute, and providing some training in basic meal planning for the medical assistants in his practice. After learning that many of his patients were interested in nutritious foods, Dr D contracted with a registered dietitian nutritionist (RDN) to develop this component of his practice.

The RDN might select copies of MyPlate,⁵ the US Department of Agriculture’s food guide, in the languages most often spoken by Dr D’s patients and train Dr D’s medical assistants to use this free resource, which includes printable material and a smart phone app. The approach taken in the training is to focus on realistic portion sizes—minimizing large amounts of energy-dense foods in favor of smaller portions of nutrient-dense, familiar foods—and avoid labeling specific foods as “good” or “bad.” Dr D might also provide incentives for his medical assistants to attend an online health coaching program to learn behavior change skills that they could apply to several health behaviors including consumption of nutritious food, smoking cessation, and exercise.

At a first in-service training for the medical assistants, the RDN would likely present a resource list that could be distributed to patients. Had Dr D and his partners reviewed it earlier, they might be surprised to learn about several previously unknown community resources and nutrition programs that were available to their patients. There were food pantries, including several that had a strong nutrition education component because they were affiliated with the foods and nutrition department at a local university. The nutrition department at the hospital where Dr D and his colleagues admitted patients offered classes on various nutrition topics as part of their commitment to the surrounding community and provided a series of classes about preparing quick, nutritious meals on a budget on their website. There was a community food bank that accepted donations from nearby restaurants and also distributed produce grown in a community garden. The mission of one of these programs was aligned with the goals of Dr D’s practice, so he might add it to a list of charitable foundations he supports. Dr D and his colleagues might also learn that the Supplemental Nutrition Assistance Program (SNAP) is accessed by many of his patients as a popular way to encourage purchasing fresh produce at nearby farmers’ markets.

In the Community

Dr D could delegate development of a nutrition component for his practice and open time in his schedule to concentrate on improving the diets of community members. Consistent with Opinion 11.1.1 in the *AMA Code*, he might do some reading so that he could apply best-available evidence to the health care services he provides.⁶ For example, Dr D might find data suggesting that people purchase the same types of foods regardless of where they shop^{7,8}—whether in a corner store in a food desert like the one surrounding his practice or in a distant full-service grocery like the one in his neighborhood. Dr D might not favor building a full-service grocery store near his practice for other reasons. He might know that costs for building a full-service grocery store can exceed several hundred thousand dollars depending upon the business model selected.⁹ Some community activists might oppose full-service grocery stores because they fear negative effects of community development and gentrification. Finally, because corner stores can be viewed as a community resource and because they can be more successful in promoting nutritious foods than full-service grocery stores, Dr D might decide to help strengthen the existing business community by engaging corner store operators in an intervention to stock nutritious foods. Dr D might also know of an initiative to implement minimum stocking requirements for nutritious foods in stores that accepted SNAP and that merchants objected to these requirements because perishable items such as low-fat milk and fresh fruit were unpopular with consumers and often spoiled before they sold.¹⁰ To lessen the problem of spoilage, Dr D could encourage small store owners to stock whole grains, dried peas, dried beans, dried fruits, and nuts used in cooking traditional foods enjoyed by members of the community. He could also offer a small incentive to store owners who stop by his office to view the brief nutrition videos he offers his patients to promote consistent messaging in the community around these products.

A Way Forward

Improving the diets of people who live in food deserts is a complicated problem at the intersection of culture, education, and economics. Dr D will clearly need to collaborate with his patients and with leaders in the community to improve the availability and intake of nutritious foods. He should continue to learn more about making nutritious foods available in order to support initiatives based on scientific evidence and follow the opinions in the *AMA Code*, which provide a great deal of guidance related to this complicated problem.

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Editor's Note

The case to which this commentary is a response was developed by the editorial staff.

Citation

AMA J Ethics. 2018;20(10):E918-923.

DOI

10.1001/amajethics.2018.918.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

CASE AND COMMENTARY

Do Infant Formula Giveaways Undermine or Support Women's Choices?

Stephanie Morain, PhD, MPH and Anne Barnhill, PhD

Abstract

Eliminating formula giveaways ("banning the bag") has been embraced as a way to reduce the influence of formula marketing in hospitals and to increase breastfeeding rates among new mothers, but the policy raises ethical concerns in the mind of some, notably because it denies a useful benefit to mothers who have trouble affording formula. Hospital policies to promote breastfeeding, including banning the bag, should be sensitive to the economic and other costs associated with breastfeeding and should be consciously designed to make breastfeeding easier and not just to make formula feeding more difficult. We recommend that hospitals evaluate the negative impacts of banning the bag on their patient population in order to ensure that families are not being negatively affected.

Case

B General Hospital has been serving its community for more than 100 years. While its patient population has changed substantially over the years to one that is more demographically diverse, the hospital is still relied upon to provide a full range of health care services despite the fact that it serves mostly patients who are poor, underinsured, or undocumented. To patients who are new mothers, B General Hospital has been distributing infant formula discharge bags for many years, and, from all accounts, this service is highly valued among community members and widely regarded as not only successful but essential.

Dr X is a family physician who just started at B General Hospital 9 months ago. She saw it as a place where she could deliver good prenatal and postnatal care to a vulnerable and underserved patient population. With that in mind, she raises a concern at the next department meeting: "Given the widely documented benefits of breastfeeding, I don't think we should continue to distribute infant formula discharge bags. Continuing to distribute the formulas primarily serves the needs of the breastmilk substitute companies rather than our patients."

Another physician disagrees, emphasizing, "The patients in this community appreciate and rely upon getting the infant formula. We still encourage breastfeeding, but our

patients—these new mothers—see the formula as an easy-to-use supplement to their baby’s overall nutritional intake.”

Dr S, the department chair, wonders how best to address this difference in professional opinion and the needs of the community members she and her colleagues serve.

Commentary

Leading clinical and public health organizations, including the American Academy of Pediatrics¹ and the World Health Organization,² recommend exclusive breastfeeding for about 6 months, citing health benefits to both the infant and the mother, including decreased rates of infant gastrointestinal disease and ear infections as well as earlier return to maternal prepregnancy weight.¹ However, rates of women in the United States who initiate breastfeeding and who breastfeed exclusively to 6 months consistently fall short of public health goals. While roughly 81% of women in the United States initiate breastfeeding, less than 23% breastfeed exclusively to 6 months.^{1,3} Various strategies have been proposed to increase rates of exclusive breastfeeding and reduce the use of infant formula.⁴ However, efforts to reduce formula feeding have provoked public controversy over questions ranging from the strength of the evidence of the health benefits associated with breastfeeding, to whether breastfeeding should be viewed as a matter of personal choice or public health, to the broader social and economic features that shape infant feeding practices.⁵

In this commentary, we examine the arguments for and against eliminating formula giveaways and suggest ethical questions to guide decisions about whether to continue their use. Ultimately, we argue that efforts to promote the health of women and infants in an ethically appropriate way will require health systems—and society—to do more than merely “ban the bag.”

The Case for Eliminating Formula Giveaways

Eliminating formula giveaways to new mothers when they are discharged from the hospital (banning the bag) has been embraced as part of comprehensive breastfeeding promotion—a way to increase rates of exclusive breastfeeding, increase breastfeeding duration, and protect women from the influence of formula marketing.^{6,7} The evidence supporting these claims, however, is mixed.

Advocates of eliminating formula giveaways argue that they are associated with lower rates of exclusive and long-duration breastfeeding.⁸ Some studies show that receiving free formula in a hospital gift pack is associated with lower rates of exclusive breastfeeding at 3 weeks, 10 weeks or 4 months.^{7,9-11} On the other hand, Neifert et al. found no significant effect of formula giveaways on breastfeeding duration among adolescent mothers,¹² and Evans et al. found no significant difference in breastfeeding duration between women who received a formula giveaway and those who did not.¹³

According to a 2000 review by the Cochrane Collaboration, formula giveaways are associated with a small overall reduction in rates of exclusive breastfeeding at 6 weeks, 3 months and 6 months postpartum.¹⁴ However, this review did not find evidence that formula giveaways led to earlier termination of nonexclusive breastfeeding. Furthermore, the Cochrane authors noted that the study populations consisted primarily of well-educated, English-speaking women and that the results might not generalize to women with low income or Hispanic women.¹⁴

Eliminating formula giveaways is sometimes framed as a way to protect women from formula [marketing](#). For example, in 2012, New York City launched a voluntary initiative asking hospitals to ban the bag and to refrain from giving supplementary formula to breast-fed infants unless medically indicated. In announcing the initiative, the city claimed that formula giveaways “interfere” with breastfeeding.¹⁵ Dr X also gives voice to the perspective that formula marketing is a potentially harmful influence when she says that continuing the formula giveaways “primarily serves the needs of the breastmilk substitute companies rather than our patients.” It is reasonable that Dr X would assume that formula companies’ marketing efforts—including formula giveaways in hospitals—aim to maximize companies’ profits and not to maximize benefits to infants and families. Nevertheless, as the other physician in this case scenario emphasized, formula giveaways might benefit some patients, particularly patients with lower incomes.

The Case for Maintaining Formula Giveaways

The case for maintaining formula giveaways is that formula feeding and supplementing with formula can be the right choice for some women and families. Ending giveaways does not support these women’s choices and in fact denies them economic benefit. Banning the bag could also reinforce a broader dynamic—of concern to critics of breastfeeding promotion—in which formula-feeding women feel shamed for their choices.

Costs of breastfeeding for women and families. Concerns have also been raised by scholars, clinicians, and mothers themselves that breastfeeding can have significant costs for women and their families, which often go unrecognized and unmeasured.^{5,16} Breastfeeding imposes substantial time constraints, disrupts sleep, and could cause physical discomfort or even pain.¹⁷ Breastfeeding can also have economic costs. Motherhood is associated with earnings losses for women, and mothers who breastfeed for 6 months or more experience larger and more prolonged earnings losses than mothers who breastfeed for a shorter duration or who do not breastfeed at all.¹⁸ Breastfeeding is time consuming, and breastfeeding—especially exclusive breastfeeding—can make returning to work more difficult, given the need to pump multiple times per day.

Additional challenges have been raised related to breastfeeding and employment. Employment outside the home, particularly full-time employment, is negatively associated with breastfeeding duration. One study of new mothers found little difference in breastfeeding initiation in the hospital between women who were and who were not employed full time outside the home (65.5% vs 64.8%, respectively).¹⁹ However, a clear gap emerged upon return to full-time employment: 35% of nonworking mothers breastfed 6 months after delivery and only 26.1% of those working full time did so.¹⁹ Another study of mostly single mothers with low income found that mothers returning to work have 2.18 times the odds of terminating breastfeeding as their nonworking counterparts.²⁰ The burdens of combining work and breastfeeding are particularly high for women with low incomes due to a variety of factors including lack of flexibility in scheduling, lack of privacy, and insufficient protections from employment discrimination.²¹

Supporting women's choice to breastfeed or formula feed. In light of the costs of breastfeeding, formula feeding or formula supplementation can be the right decision for some women and families. Therefore, health care systems should not denigrate or dismiss women's choices to use formula as merely the result of clever formula marketing. Instead, they should recognize that formula might be an informed choice, one made for good reasons. This position is consistent with that of the American College of Obstetricians and Gynecologists, which explicitly affirms the importance of supporting women in their infant feeding choices: "Obstetrician-gynecologists and other obstetric care providers should support each woman's informed decision about whether to initiate or continue breastfeeding, recognizing that she is uniquely qualified to decide whether exclusive breastfeeding, mixed feeding, or formula feeding is optimal for her and her infant."²²

Despite the recognized importance of helping women make informed infant feeding choices and of supporting these choices, there is both anecdotal and empirical evidence that some mothers do not feel supported but instead feel judged or shamed. As reported in blogs and personal accounts, some mothers express dissatisfaction with hospital practices meant to promote breastfeeding, reporting that they were pressured to breastfeed and not supported in formula feeding or formula supplementation.²³⁻²⁶ Additionally, one survey of mothers in a Baby-Friendly hospital (a hospital conforming with practices recommended by the Baby Friendly Hospital Initiative, a global program to encourage breastfeeding and refrain from promoting formula²⁷) found that 26% of formula-feeding mothers felt shamed for the decision to formula feed and 35.7% felt not adequately informed about formula feeding.²⁸ In a qualitative study, nonbreastfeeding women reported that probreastfeeding messages from health professionals could lead them to feel that not breastfeeding makes them a "bad mother," one who was "denying" or "depriving" her child. As one explained, "breastfeeding [...] is pushed down your throat and out of guilt you are made to feel if you don't do it, you are doing your child a mis-

justice.”²⁹ Women report feeling both guilt and shame for using formula—guilt for the potential harm associated with the “risks” of not breastfeeding and shame for failing to live up to the standard of “good motherhood.”³⁰

Do Formula Giveaways Support or Undermine Women’s Choices?

What counts as supporting women’s choices in the context of formula giveaways, given that women make different choices about how to feed their infants and that women may change their minds? For women who have already decided to formula feed or to supplement with formula, not getting the free formula in no respect supports their choice and denies them an economic benefit—one that could be particularly important if they have low incomes, like those served by B General Hospital, and thus generally face higher obstacles to breastfeeding. For women who plan to breastfeed exclusively, it is a complex question whether the offer of free formula undermines their choices or not. Perrine et al. found that most mothers do not meet their prepartum breastfeeding goals, including the goals of breastfeeding exclusively and breastfeeding for at least 3 months.³¹ When a woman who intended to breastfeed exclusively feeds her infant the free formula she got in the hospital, how should we describe what has happened? Has she had her intentions to breastfeed exclusively undermined by formula giveaways? Or has she changed her mind about the best way for her to feed her infant, now that she has more information about the implications of breastfeeding for her and her family? Both scenarios seem plausible. Some women who supplement with formula might have had their breastfeeding intentions undermined by hospital formula giveaways. Yet other women might have simply changed their minds—and have done so for legitimate reasons.

In light of these ethical considerations, we recommend that Dr S explore what B General Hospital’s patient population is likely to experience were formula giveaways to cease. For example, if new mothers intend to use formula, can they readily access it through other programs than hospital giveaways, and can they do so without experiencing substantial delays or significant financial hardships? For women who intend to breastfeed, does ending giveaways better enable them to fulfill their intentions? Do women who consider switching or supplementing to formula feel supported or shamed when doing so? Before making a policy change, Dr S should consider engaging with B General Hospital patients to better understand how they experience formula giveaways. Additionally, Dr S should consider other ways that the institution could support breastfeeding. Prior research has identified several strategies that can support breastfeeding among women similar to those served by B Hospital, including [breast-pump](#) programs to reduce known financial barriers associated with breastfeeding, peer counseling, and enhanced lactation education and supportive services.⁴

Ultimately, making formula feeding harder is not the same as making breastfeeding easier. Infant feeding decisions reflect a complex set of factors, reflecting influences at

the individual, family, health institution, and societal levels—some of which could be more or less readily modifiable. Health systems should strive to be pro-mother and pro-baby, and not just antiformula.

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Editor’s Note

The case to which this commentary is a response was developed by the editorial staff.

Citation

AMA J Ethics. 2018;20(10):E924-931.

DOI

10.1001/amajethics.2018.924.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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ISSN 2376-6980**

CASE AND COMMENTARY

How Should Physicians Help Patients Who Are Ill Because They Work in Agriculture?

Nicole Civita, JD, LLM

Abstract

Occupational health issues are not just common for farmworkers; they are practically unavoidable. Farmworkers who seek treatment for work-related injury or illness are often unable to meaningfully reduce their exposure to risk factors without further jeopardizing their already fragile well-being and tenuous livelihoods. This case commentary addresses why and how physicians presented with patients who are ill because they work in agriculture should adjust their clinical practices to better meet the unique challenges faced by this patient population. In recognition of physicians' ethical duty to participate in activities to protect and promote the health of the public, this commentary also recommends specific actions that medical professionals can take to support systemic change that would improve farmworker health and well-being.

Case

Dr A works in a health clinic that serves several surrounding agricultural counties. His first patient of the day is Mr L who presents with nausea, abdominal pain, and diarrhea. According to the patient, he had been feeling fine until the past 24 hours. At first, he thought something he ate had made him feel ill, but neither his wife nor his 3 children had any of these symptoms.

Mr L explained that he recently learned that a friend with whom he works was experiencing similar symptoms. Even though Mr L felt a little better this morning—well enough to go to work—his wife was adamant that he see a physician because “he has never been sick a day in his life.”

Further discussion revealed that Mr L worked on one of the local farms where, during the past couple of days, pesticides and herbicides were extensively sprayed in the surrounding fields. Mr L said, “I started to notice a chemical smell coming from the orchards west of the strawberry fields where I was working.”

Dr A stated, “While I can’t say for sure, I strongly suspect that your belly pain and other symptoms are a result of agricultural pesticide and herbicide exposure. I recommend that you not return to work until the spraying is complete.”

“I have to work, Doc. My family depends on me. Besides, we’re always spraying something.”

Dr A is not sure how to respond to Mr L. Moreover, Dr A is concerned about the health of other farmworkers in the area who are also being injured by agricultural pesticide and herbicide exposure.

Commentary

Farmworkers who become ill as a result of occupational conditions cannot reduce risk factors without exposing themselves and their families to greater, often more immediate perils. Treating marginalized patients made ill by the conditions of their essential but hazardous work raises ethical issues and requires active engagement. To serve such patients, physicians should (1) appreciate the circumstances and vulnerabilities of farmworkers, (2) consider the feasibility and ramifications of treatment, (3) seek to enhance access to care and reduce barriers to treatment through collaboration, and (4) report dangerous conditions and advocate for systemic reform.

Circumstances and Unique Vulnerabilities of Farmworkers

Inherent hazards of farmwork. A farmworker’s body is his primary vocational asset. Paradoxically, a farmworker’s vocation is the primary threat to his body. Good days in the field require swift, exertive, and repetitive motion with sharp implements, putting farmworkers at high risk for degenerative musculoskeletal injuries.¹ On bad days, one-third to one-half of farmworkers are exposed to pesticides and other agrichemicals. At best, [toxic encounters](#) can cause skin and eye irritation, headaches, and flulike symptoms, such as those Mr L presents with. At worst, they are implicated in disproportionately high rates of heart disease and certain cancers.²

Farmworkers are exposed to the elements for long hours with few breaks. Most retire to dilapidated, crowded housing which might lack bathing or laundry facilities. Harsh working and substandard living conditions lead to acute illnesses and infections and undermine recovery.³ Ultimately, agricultural workers face an occupational fatality rate roughly 5 times that of other workers.⁴ In short, farmworker health is compromised to produce affordable vegetables, fruits, nuts, and berries—the very foods recommended for good health in the general population.

Structural violence—systematic ways that prevailing political, economic, and social forces damage individuals and groups⁵—drives farmworkers to migrate for work and continues in the United States. A cascade of clinically relevant stressors and harms flows

from free trade, neoliberal globalization, political instability, violent turmoil, social inequities, racism, and bias. Separation from family, social isolation, and, for some, the peril of illegal border crossings and constant threat of deportation decrease workers' ability to cope.^{6,7} Physiological consequences of stress, working poverty, and malnutrition⁸ exacerbate illness and stymie healing.

Farmworkers' deep dependence on their jobs. When Mr L told Dr A, "I have to work," he was not exaggerating. Mr L's family probably lives paycheck to paycheck, so skipping shifts can be ruinous. Difficult, hazardous work is usually well compensated, but farm work is notoriously low paid. Median wages hover around \$11.41 per hour, and the median annual income from farming is \$23,730.⁹ In addition, farmworker housing and transportation are often employer provided and cut off as soon as the worker ceases to be a productive asset. Stopping work can lead to sudden homelessness. For migrants, it can also mean isolation from one's community in displacement—the people with whom they travel, live, and labor.

Migration and immigration status also contribute to farmworkers' insecurity. Undocumented workers often owe steep debts to coyotes and labor contractors who finagle border crossings and job placements. Inability to pay ruthless criminals could have violent repercussions.³ Farmworkers with H-2A visas are authorized to work in the United States only as long as they remain employed by their sponsor. Changing farms or industries means losing legal status and risking immediate return.¹⁰ Because most farmworkers cannot take time off without facing termination, eviction, deeper poverty, separation from social supports, violence, or deportation,¹¹ Dr A should make further inquiries to assess the ramifications of advising his patient to avoid work.

Making Viable Treatment Recommendations

When treating farmworkers, context is critical. It is essential to gather information—about [patient history](#), living conditions, workplace characteristics, socioeconomic factors and other structural forces such as policies and regulations—that bears upon the feasibility and consequences of treatment for members of this marginalized population.

Physicians in rural agricultural areas should get to know local agriculture: the types of crops typically grown, major agricultural employers and their reputations, production practices and agrichemicals commonly used, and the range of manual and machine-assisted work performed. They should talk to county agricultural extension agents, attend gatherings of farmers, and host special farmworker care clinics (discussed below) to build relationships. Finally, they should leverage employers' desire for a stable, vigorous workforce to improve working and living conditions, treatment possibilities, and health outcomes for farmworker patients.

When work restrictions are medically necessary, physicians should articulate *specific* medically necessary restrictions in lieu of generic “light duty” dictates, which often result in mandatory, unpaid, and unaffordable time off. Sometimes, all available work is somewhat strenuous. But, more likely, managers erroneously believe that farmworkers are unfit for all but the most menial tasks. Racialized hierarchies, stereotypes about farmworkers—especially migrants—and the indignities of poverty segregate owner-operators (“locals” employed in managerial or administrative positions) from seasonal or temporary workers and also block most nonmanual work opportunities for farmworkers.⁷ Understanding the type of work done on area farms would enable Dr A to make tailored recommendations about alternative work, reasonable accommodations, and necessary safety measures, instead of directing his patient to stop work entirely. (Workers usually don’t have a comprehensive picture of the farm’s operations and may not be positioned to make suggestions.) Suitable alternative manual tasks may not always be light but can be less taxing on parts of the body in particular need of recuperation or may put remedial distance between the worker and certain toxic agrichemicals. Moreover, specific recommendations from a physician can help circumvent the structurally racist workplace dynamics that prevent migrant and seasonal workers from being granted less hazardous placements.

Additionally, clinicians should provide migrant workers with easy-to-read and understand information in their native language about how to reduce exposure through use of protective equipment, more frequent hand washing and showering, and laundering of clothes.¹²⁻¹⁴ Never assume that basic measures are feasible. Instead, ask about the patient’s access to (and training on) safety equipment and access to washing facilities and clean clothes.

Dr A should question Mr L further about his work and hygiene habits. “Did you inform your supervisor about the chemical smell? Do you think the pesticides were being sprayed by your employer or on nearby farm? Is safety equipment provided? How soon after your shift can you shower, change, and wash your clothes?” He should also make inquiries designed to reveal the social and power dynamics on the farm. “Do you know of any indoor or nonmanual positions on the farm? Do such jobs ever go to noncitizen employees or to people of color? If I restricted your work, whom would you tell? How do you expect they would react? Have any other employees needed a work restriction? What happened when they made their needs known?” This type of inquiry could help Dr A develop nuanced recommendations, counsel Mr L about advocating for his health needs, and gather pertinent information to disclose to authorities (discussed below).

Making Care for Farmworkers More Accessible and Comprehensive

When serving patients who are ill because they work in agriculture, health care professionals should adjust their clinical practice to reduce barriers to care, benefits, and support services that improve health outcomes. In this case, the patient has actually

made his way to the doctor's office, but all too often farmworkers are unable to clear the time and transportation hurdles to do so (at all or more than once). [Language barriers](#), situational discomfort, and below-average health literacy might add layers of difficulty.¹² Thus, it is useful for clinicians to build a network and provide referrals to physicians, pharmacies, counselors, translators, and other health care workers who also provide culturally competent care.

Holding on-farm clinics enables screening, early identification of conditions, and follow-up, which could drive better outcomes. It also gives physicians greater insight into workplace conditions and dynamics. Onsite services should be provided in dignified, private settings that promote patient comfort and candor. During a "farm call," with the patient's consent, hazard reduction, rotation of duties, and opportunities for true light duty placement after injury can be discussed directly with the owner-operator or supervisor. Physicians who are concerned about exposing themselves to toxins on farms should confer with the farm owner(s) to set clinic hours during times between applications of agrichemicals. If site visits are not feasible, permitted, or are deemed too risky, health care practitioners can schedule special clinic hours when workers are less likely to be on the clock and more able to travel into town.

Health care practitioners in predominately agricultural areas should also identify and coordinate with complementary health care workers, such as legal aid attorneys, social service agents, nutrition assistance outreach programs, and translators able to communicate in relevant languages (not always Spanish) since enhancing farmworker-patient access to a range of public, free, or low-cost social services promotes well-being. Social services could help reduce farmworkers' dependence on hazardous jobs by improving access to tangible resources (eg, sanitary facilities, toiletries, food aid, and donated clothing). Legal assistance can help farmworkers claim unpaid wages, address unsafe working conditions, facilitate access to safety equipment, and protect farmworkers from retaliation.

If workers' compensation coverage is available,⁷ clinicians should consider the ramifications of their notes, diagnoses, and treatment recommendations, all of which influence access to essential benefits. Understanding how employers, insurers, and the legal system are likely to respond to the restrictions prescribed can help to keep a discrete illness (eg, acute pesticide exposure) from ballooning into an intractable vulnerability (eg, homelessness, hunger, and loss of income while sick). Because benefits could be denied if physicians chart suspicions of malingering, physicians should check their own biases and be attuned to the influence of language and cultural differences, confusion, and fear on their assessment of the patient's credibility.^{15,16} Farmworkers have little incentive to fake illness or injury. They perform noble, necessary, and notoriously dangerous work upon which we all rely, and they should be given the benefit of the doubt.

Alert Authorities and Support Systemic Change

Because opportunities for effective treatment of individual farmworker-patients are sharply constrained by economic realities, physicians should not limit their response to patient interactions. In furtherance of their ethical duty to participate in activities to protect and promote public health, physicians should actively [support systemic change](#) for improved farmworker health and well-being.¹⁷ Existing farmworker protections and environmental laws fall short, leaving ample room for improvement. Indeed, some wage laws tie worker pay to productivity, incentivizing workers to jeopardize their own health.¹⁸ Even when appropriate laws are in place, enforcement capacity is terribly limited.¹⁹

When unsafe conditions, including pesticide toxicity, are suspected, physicians must alert the relevant regulatory authorities for investigation. Because most states mandate pesticide incident reporting,²⁰ the Health Insurance Portability and Accountability Act (HIPAA) limitations on releasing personal health information (PHI) do not bar disclosure of PHI for public health activities.²¹ The Migrant Clinicians Network's pesticide reporting map can be used to identify local reporting requirements.²⁰ In this case, Dr A believes that his patient and at least one of his coworkers have been exposed to pesticides in unsafe ways. He has also been told that the farm is "always spraying something." Based on this information, Dr A has an ethical and (in most places) a legal obligation to alert public health officials.

In addition to complying with mandatory reporting requirements, medical professionals are well positioned to illuminate unlawful conduct, regulatory violations, and systemic barriers to farmworker well-being. Physicians, individually or through professional associations, should support structural reform by engaging with local public health agencies and testifying about occupational hazards, resulting injuries, and public costs. In so doing, they can shed light on problematic access to health care and expose flaws in the workers' compensation system. Physicians who relate well to local agricultural leaders might be able to marshal support for policies and funds that create a social and economic safety net for farmworkers. Such initiatives are ethically important because they improve worker health and well-being and support the agriculture sector, enabling production of healthy food for all.

Summary

Farmworkers who experience toxicity from exposure to agrichemicals (among other occupational injuries and illnesses) struggle to heal because they have little ability to avoid workplace hazards and cannot take time off without becoming financially and socially vulnerable. Accordingly, in a clinical context, physicians must explore the feasibility and ramifications of treatment recommendations with patients before telling them to stop work, change duties, or even undertake basic hygienic practices. Because many farmworkers are not native English speakers, having a translator available and

using easy-to-understand visual materials are essential for effective communication. Physicians should also remain cognizant of how third parties (eg, employers, insurers, and the legal system) are likely to respond to their notes, diagnoses, and prescriptions. It is critical for physicians to check their own assumptions and biases before concluding that a farmworker patient, who might be frightened, confused, or traumatized, is untrustworthy or malingering.

Moreover, because the health of farmworkers is more substantially degraded by structural forces than by individual experiences and behaviors, physicians seeking to treat causes rather than symptoms should also attend to the systems in which farmworkers live, work, and struggle. To better serve farmworker patients, physicians—especially those working in rural agricultural areas—should learn about the nature and dynamics of the agricultural sector in their region so that they can articulate feasible treatment recommendations and work restrictions. By building relationships with agricultural leaders and employers, physicians might be able to shine a light on practices that harm farmworkers' health and help identify alternatives that could both reduce the incidence and severity of harms and provide sick or injured workers with meaningful opportunities to recuperate. Physicians could also consider modifying the times, places, and manner in which they deliver health care services to reduce barriers to access and coordinating with complementary social and legal services workers to increase the range of support that an ill or injured farmworker can access.

In addition to these collaborative approaches, physicians should take seriously their legal duties to promptly report unsafe working conditions to the appropriate authorities. Relatedly, physicians should make good on their ethical duties to enhance public health by engaging in or supporting reform campaigns aimed at improving farmworker health and well-being. Making extra efforts to appreciate the contexts in which farmworkers toil, are injured, and struggle to heal will enable physicians to provide high-quality care to a group of people who are often overlooked.

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Editor's Note

The case to which this commentary is a response was developed by the editorial staff.

Citation

AMA J Ethics. 2018;20(10):E932-940.

DOI

10.1001/amajethics.2018.932.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

IN THE LITERATURE

Why Marginalization, Not Vulnerability, Can Best Identify People in Need of Special Medical and Nutrition Care

Alexis K. Walker, PhD and Elizabeth L. Fox, PhD

Abstract

In a 2015 paper published in the *Journal of Bioethical Inquiry*, bioethicist Henk ten Have identifies vulnerability as a “controversial topic in bioethics” and argues that bioethical attention to vulnerability comes at the expense of sufficient attention to the social structures that shape human life. In this paper, we situate ten Have’s argument within the broader bioethical literature, emphasizing how critiques of vulnerability can enrich approaches in clinical settings, including in nutrition, where the concept of vulnerability is not foreign (eg, children are often labeled members of a vulnerable group). We use an example of food (in)security to show how reframing vulnerability to capture “layers of marginalization” can help clinicians and organizations more clearly identify who is most in need, develop solutions for what should be done, and determine how and by whom those solutions should be implemented.

Vulnerability and Marginalization

In a 2015 paper published in the *Journal of Bioethical Inquiry*, bioethicist Henk ten Have identifies vulnerability as a “popular though controversial topic in bioethics” and argues that bioethical attention to vulnerability focuses on individuals at the expense of sufficient attention to the social connections that shape human life.¹ The concept of vulnerability has been applied in a variety of contexts, including nutrition; children, adolescent girls, [pregnant and lactating women](#), displaced persons, indigenous persons, and the elderly are often labeled members of nutritionally vulnerable groups. In this paper, we situate ten Have’s argument within the broader bioethical literature and emphasize how [critiques of vulnerability in research contexts](#) can enrich approaches in clinical care broadly and nutrition care specifically. We close the paper using food (in)security as an example to demonstrate how a more nuanced view of marginalization can improve health care interventions. In so doing, we build on the work of Florencia Luna,² arguing that by reframing vulnerability in terms of “layers” we can capture how patients can be marginalized in many overlapping ways, as opposed to being marginalized by single group membership. We suggest that attention to marginalization

highlights the social *processes* underlying patients' lives and thus goes further than the concept of vulnerability in helping health care practitioners to identify who is most at risk of food insecurity, to develop solutions for what should be done, and to determine how and by whom solutions should be implemented.

Vulnerability and Its Critiques

Much attention to vulnerability has focused on the context of biomedical research, where the term has been extensively integrated into research policy and infrastructures. ten Have notes that the concept of vulnerability was used in the Belmont Report,¹ which argued that, as a matter of justice, "vulnerable subjects"—including "racial minorities, the economically disadvantaged, the very sick, and the institutionalized"—ought not bear undue burdens of frequent enrollment in research "owing to their ready availability in settings where research is conducted."³ The report also raised concerns regarding the adequacy of informed consent among such populations,³ and it ultimately formed the basis of protections for vulnerable populations in the United States' federal regulations on human subjects research.⁴

ten Have notes that the 2005 United Nations Educational, Scientific and Cultural Organization's Universal Declaration on Bioethics and Human Rights lifts the concept of vulnerability from the research context and promotes it as "a fundamental bioethical principle—no longer only relevant for medical research but also for healthcare."¹ Governments and their advisory boards have drawn attention to vulnerability as a significant concern in the provision of health care.⁵⁻⁷ In 1998, a United States President's Advisory Commission, for example, argued that "there is a clear need to increase the level of attention paid to vulnerable groups, including both those who, because of their chronic illness or disability, have many interactions with the health system, and those who have difficulty accessing the system and may be most likely to fall through the cracks."⁵

As this report suggests, what people are thought to be *vulnerable to* differs substantially in research and health care contexts. In research, vulnerability typically focuses on the possibility that some people might be taken advantage of and harmed through research efforts.² The implication is that a person or population might be [vulnerable to exploitation](#) or to undue burdens of research participation. The focus is on protecting people from research participation that might expose them to undue risk or conflict with their best interests. In today's research context, scholars and patient groups have focused not only on protection from such potential harms but also on access to the possible benefits of research participation. However, Hurst argues that what one is *vulnerable to* is quite different in health care delivery, where concerns focus on protecting people not from harmful participation or exploitation but from inadequate or inappropriate care.⁸ In research, vulnerability protection is generally conceived as a protection from *detrimental* engagement, while in health care delivery, protection focuses on *lack of* engagement.

Despite its origins in the Belmont Report and its enduring role in human subjects research regulations, the concept of vulnerability has been heavily critiqued in the research context. Levine et al. argue that vulnerability is a poor tool for protecting people from possible harms of research as it does not track peoples' morally relevant features with sufficient precision.⁹ For example, the term has been applied to pregnant women and to people of color as well as to children and the cognitively impaired.^{3,9} However, to lump pregnant women and people of color in with children and people with cognitive impairment is not only imprecise but also potentially infantilizing. Levine et al. also suggest that the concept of vulnerability weakens research review by focusing attention on participants rather than "on characteristics of the research protocol and environment that present ethical challenges."⁹ Henderson et al. take this critique further by likening the label of vulnerability to "status crimes like vagrancy or homelessness," arguing that labeling people vulnerable "is highly likely to exacerbate stigma."¹⁰ Several papers highlight how the term "vulnerable" insinuates personal weakness rather than drawing attention to the contexts that place people in vulnerable positions.^{1,2} We argue that the term "marginalized" is in many cases more apt, as it draws attention to the social processes behind the status.

Although critiques of the term "vulnerable" in the research context should make practitioners and scholars wary of its use in clinical environments, it is clear that attention to the background and contexts of patients' lives are crucial to care. A substantial body of research demonstrates that discrimination in health care environments limits health care for people of color and members of other marginalized groups, such as sex workers and the homeless.¹¹ Levine et al. suggest that the concept of vulnerability be supplemented with a designation for research that requires "special scrutiny."⁹ We suggest that a similar designation of *special care* be operationalized to draw attention to the extra resources needed to counter the effects of social marginalization on the provision of health care. Rather than emphasize vulnerability, with all the implications noted above, health care workers could speak of patients who deserve special care to ensure that they are treated optimally despite social barriers.

ten Have's paper highlights the ongoing need for improved theorizing about vulnerability; he argues for focusing less on individual agency and more on respecting our common human vulnerability.¹ But how should these concepts best be realized in practice? Luna's work on "layers of vulnerability" calls attention to the different factors, contexts, and processes that lead to marginalization²; we argue that this framework is particularly salient in the context of food insecurity, and we provide suggestions for how attention to marginalization can be put into practice in nutrition.

Food Insecurity and Marginalization

Food insecurity is defined as the economic or social condition of unreliable access to adequate, affordable, nutritious, and safe food for an active, healthy life.¹² It is linked to

adverse outcomes, such as inadequate diet, poor physical and mental health, challenges to cognitive development, and noncommunicable diseases in adulthood.^{13,14} Programs addressing food insecurity often appropriately prioritize children due to their unique nutritional needs. However, issues related to food insecurity are, at root, issues of marginalization (based on social identities and positioning). Understanding the contexts of marginalization that result in food insecurity is essential to addressing it.

Food insecurity is a multilayered problem rooted in interconnected economic, social, environmental, and political systems.¹⁵ Luna's concept of "layering" is a useful tool to capture the multiple and often overlapping conditions that might result in food insecurity. For example, an immigrant child is not food insecure by virtue simply or solely of her immigration status. Rather, an immigrant child living in a community that is a new destination for immigrants, who has less access to well-developed safety nets, social networks, culturally competent health care practitioners, and advocacy organizations, might be more likely to be food insecure than an immigrant child in a destination that has a tradition and track record of meeting the needs of immigrants appropriately.¹⁶ If the child's caregivers are well educated and have access to resources, they might be able to overcome the barriers faced at a new destination, whereas an immigrant child of parents with fewer resources is further marginalized. Additional layers, such as caregivers' proficiency with the language of the new destination, documentation status, access to transportation, and so on, might also influence the child's food security status. Going beyond the concept of vulnerability, the concept of "layers of marginalization" helps illuminate why some people are more likely to experience food insecurity and thus provides insight into whom to target in interventions and how to intervene.¹⁷

Applying the concept of layering to practice can improve implementation of food insecurity interventions in at least 3 ways. First, attention to layers can help practitioners identify families and individuals who deserve special care as a result of their social marginalization, without blaming or stigmatizing them. To do so requires that health care practitioners and trainees reflect on the social processes by which certain people are more marginalized than others.¹⁷ It involves clinicians reframing their language (in charts, interactions with patients, and interactions with other practitioners) to avoid judgments based on stereotypes. For instance, chart notes can portray patients negatively through word choice or the presentation of irrelevant details and can cast doubt on patients' veracity or imply that they are responsible in problematic interactions; such stigmatizing notes are associated with more negative attitudes towards patients and poorer patient care.¹⁸ Reflections and actions that help practitioners address their own implicit biases can improve care provided to patients,¹⁹ suggesting that such interventions would also improve food insecurity interventions.

Second, by drawing attention to the overlapping contexts contributing to a person's social situation, layering as a metaphor accommodates a notion of collaboration among health care practitioners and patients that seems likely to promote sensitive accounting

of patients' concerns, priorities, and needs.²⁰ For example, instead of employing the 2-item screening questionnaire for household food insecurity discussed by the American Academy of Pediatrics (in which a positive screening result entails an affirmative response to 1 of 2 questions about fear of running out of food and actually running out of food in the last 12 months),¹³ some pediatric clinics have found that asking patients if they would like help or assistance (eg, "Would you like help with any of the following?") is more effective in addressing patients' needs.^{21,22} While families might not always be ready or able to access resources, a referral process that solicits the patient's preferences and input gives power to the patient and more sensitively captures social needs that might not meet screening thresholds.²¹ Here, attention to layers helps shape approaches to care that are more sensitive to the complexity of patients' lived experience than broad categories might otherwise be.

Finally, heightened attention to the layers of marginalization that contribute to food insecurity encourages clinical contexts to become "communities of care," in which staff members, trained volunteers, or community health workers connect and refer patients to community-based resources.¹⁴ Direct relationships between clinics and organizations such as the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and local food banks also contribute to communities of care.¹⁴ Such [systems of social support](#) that are connected to or integrated into facility-based settings can increase families' receipt of resources to address their unmet needs.²²

Conclusions

We argue that identifying marginalized groups as vulnerable can be inadequate and, at worst, stigmatizing and unfair. Health care interventions, including those addressing food insecurity, could benefit from considering the multiple layers of a person's life that reflect social marginalization. This approach would help to better target and adequately reach persons most at risk of food insecurity through improved patient-centered care.

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Citation

AMA J Ethics. 2018;20(10):E941-947.

DOI

10.1001/amajethics.2018.941.

Acknowledgements

Alexis K. Walker and Elizabeth L. Fox contributed equally to this work. The authors also thank Anne Barnhill, Claire Davis, and Ruth Faden for their feedback during development of this paper.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

ORIGINAL RESEARCH

Addressing Medical Students' Negative Bias Toward Patients With Obesity Through Ethics Education

Gail Geller, ScD, MHS and Paul A. Watkins, MD, PhD

Abstract

Background: Negative bias toward patients with obesity is an ethical challenge in patient care. Several interventions to mitigate medical students' negative weight bias have been tried but none with an explicit focus on ethics. Here we describe first-year medical students' attitudes toward obesity and our effort to improve their attitudes through an innovative ethics session embedded within the required course, "Obesity, Nutrition, and Behavior Change," at Johns Hopkins University School of Medicine.

Methods: Precourse survey data were collected from 6 first-year cohorts (2012–2017). Before the ethics session, students take the Implicit Association Test (IAT) to measure implicit weight bias. During the session, students discuss their classmates' personal struggles with weight, beliefs about causes of obesity, and the IAT results. They also watch and discuss video clips from the TV show *House* depicting negative weight bias. In addition, the 2017 cohort was surveyed 4 months later to evaluate the impact of different components of the session on students' self-reported attitudes.

Results: All students responded to the precourse survey. Across cohorts, IAT results revealed that 70% of students held a thin preference, 18% were neutral and 12% held a fat preference. Forty-seven percent had personally struggled with weight loss. While most students thought obesity is a disease (89%) or behavioral (88%), 74% thought it results from ignorance, and 28% thought people with obesity are lazy. Among the 59 respondents to the follow-up survey, 30% reported improvement in their attitudes after the session. Over 40% thought it was useful to discuss students' personal struggles with weight and the IAT and survey results, and over 70% thought the *House* video clips were useful.

Conclusions: Medical students have negative attitudes about obesity that are consistent over time. Providing opportunities for students to discuss their personal experiences and beliefs about obesity within an ethics framework and using popular media as a basis for discussion might improve their attitudes toward obesity.

Background

Discriminatory attitudes toward patients with obesity is common among physicians—both among those who practice primary care and among those who specialize in treating obesity¹⁻³—and medical students.⁴⁻⁸ Such negative attitudes—known as **negative weight bias**—adversely affect clinical practice and patient outcomes.⁹ Evidence indicates that negative weight bias can reduce access to surgery for obese patients,¹⁰ contribute to disrespectful attitudes among physicians,³ and decrease patient trust in physicians.¹¹ Evidence also suggests that negative weight bias is associated with misperceptions about causes of obesity.¹² Unfortunately, negative attitudes, beliefs, and behaviors regarding obesity are perpetuated in patient care when medical students observe and copy the behaviors of physicians who model negative weight bias. Several studies indicate that personal experiences with weight also contribute to medical students' negative attitudes and beliefs.¹³⁻¹⁵ Perhaps counterintuitively, evidence suggests that medical students who themselves have successively struggled with overweight or obesity are more likely to hold negative attitudes toward patients with obesity than their counterparts who have regained lost weight.¹³ Of particular concern is that medical students do not seem aware of their negative biases.¹⁶

Several interventions to address and mitigate negative weight bias among physicians and medical students have been developed and evaluated but with mixed results.¹⁷⁻²⁶ With few exceptions,^{25,27} educational research designed to combat negative weight bias uses standard curricular interventions such as didactic presentations, role playing, and standardized patients.^{18-24,26} To our knowledge, none of these interventions has explicitly highlighted negative weight bias as an ethical challenge in caring for patients who struggle with obesity. In our first-year medical curriculum, we had an opportunity to incorporate an innovative ethics session within our required course, "Obesity, Nutrition, and Behavior Change." Embedded in that course is a 90-minute small group session on ethics and professionalism in the care of patients with obesity. This session is designed to provide students with an opportunity to reflect on their own weight biases and explore the link between negative attitudes toward obesity and unethical or unprofessional behavior. Here, we describe attitudes and beliefs about weight among several cohorts of medical students and how our innovative ethics session addresses them.

Methods

Measures. Prior to the ethics session, students are required to take the online Implicit Association Test (IAT) on attitudes toward weight. The IAT measures the strength of associations between concepts (eg, people with obesity) and evaluations (eg, good, bad) or stereotypes (eg, lazy).²⁸ Students then complete an anonymous online survey using the Blackboard platform in which they document their personal struggles with weight, their knowledge and beliefs about the causes of obesity, and their IAT results (see table 1).

Table 1. Selected Survey Questions and IAT Responses	
Yes/No Questions	
Have you ever struggled with your weight?	
Have you ever sought help with weight control issues?	
Are any of your family members/close friends overweight?	
Likert Scale Questions^a	
Obesity is a disease	
Obesity is behavioral (due to overeating)	
Obesity results from poverty (inability to afford healthy food)	
Obesity results from ignorance (lack of education/information about healthy eating)	
Obese people are lazy/weak-willed	
Obesity is primarily genetic/inherited	
IAT Preferences	
Strong/Moderate/Slight automatic preference for thin people	
Little to no automatic preference between fat and thin people	
Strong/Moderate/Slight automatic preference for fat people	
^a Questions take the form, "To what extent do you agree with the following statement?" Single-choice responses are "strongly agree," "somewhat agree," "somewhat disagree," "strongly disagree."	

Sample. Precourse data were collected from 6 first-year medical student cohorts of approximately 120 students each (range, 108 to 119) between 2012 and 2017. The class sizes were as follows: 2012 (N = 109), 2013 (N = 110), 2014 (N = 115), 2015 (N = 118), 2016 (N = 115), 2017 (N = 110). Each cohort was subdivided into 6 small groups of 20 students.

Intervention. Each small group is facilitated by an experienced faculty member with expertise in bioethics who shares his or her own experiences with weight to model self-disclosure. The facilitators are aware of the sensitive nature of this topic and reassure students that they do not have to share a personal story if they are uncomfortable doing so. At the beginning of the small group session, students are asked to discuss their own struggles with weight. The discussion of personal experiences is then followed by a review and discussion of their class' and the previous class' survey data including IAT results and beliefs about causes of obesity. Finally, students watch and discuss video clips from 2 episodes of the TV show *House*, each of which centers on a patient with obesity—one an adult male and one a preteen girl—in the order in which the group chooses. The episodes involve both senior physicians and residents. Facilitators then engage the students in discussion of particular ethics and professionalism themes depicted in the videos, such as (1) disrespectful behavior on the part of senior physicians and the tendency of residents and fellows—ie, younger people in the hierarchy—not to object when they hear their superiors make offensive comments, and sometimes even laugh, about patients with obesity; (2) disagreement among residents about the appropriateness of providing treatment to patients whom they think have personal responsibility for their health problems; (3) tendency toward victim blaming among some characters in the video clips; (4) questions about whether morbid obesity ought to be considered a disability; and (5) challenges physicians face when caring for patients they perceive as “difficult” because the [patients' preferences for care differ](#) from what the physician believes is in the patients' best interests.

An overall course evaluation is distributed every year, but only the most recent cohort of students were asked to assess the “ethics and professionalism” session. This last cohort was surveyed 4 months after the course to ascertain students' impressions of the different components of the ethics session and the impact each component had on their self-reported attitudes toward obesity. This survey was conducted during another course that first-year students attend using the iClicker Student Response System.

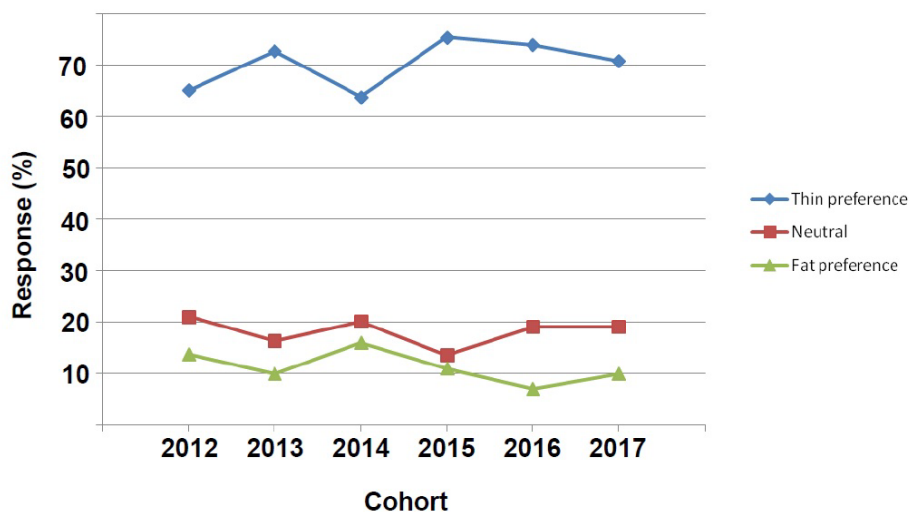
This study was deemed exempt from Institutional Review Board review by Johns Hopkins University.

Results

Pre-session survey. Because the IAT and the anonymous survey were required assignments for the group discussion on ethics and obesity, compliance was nearly 100% for each of the 6 cohorts. Fifty percent of the total respondents were male and 49% were female (1% declined to answer). Across cohorts, 70% of students had a thin preference (range, 64% to 74%), and only 11% of students had a fat preference (range, 7% to 16%). Eighteen percent of students had no preference (range, 14% to 21%). Over the 6 years of data collection, there were no obvious trends (see figure 1). Minor

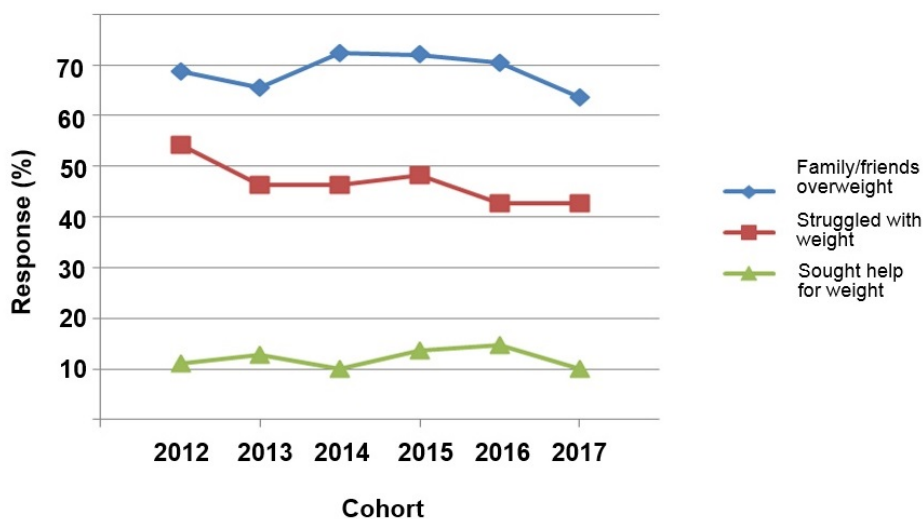
fluctuations, such as the dip in thin preference in 2014, were not thought to reflect a meaningful difference in attitudes.

Figure 1. IAT Results



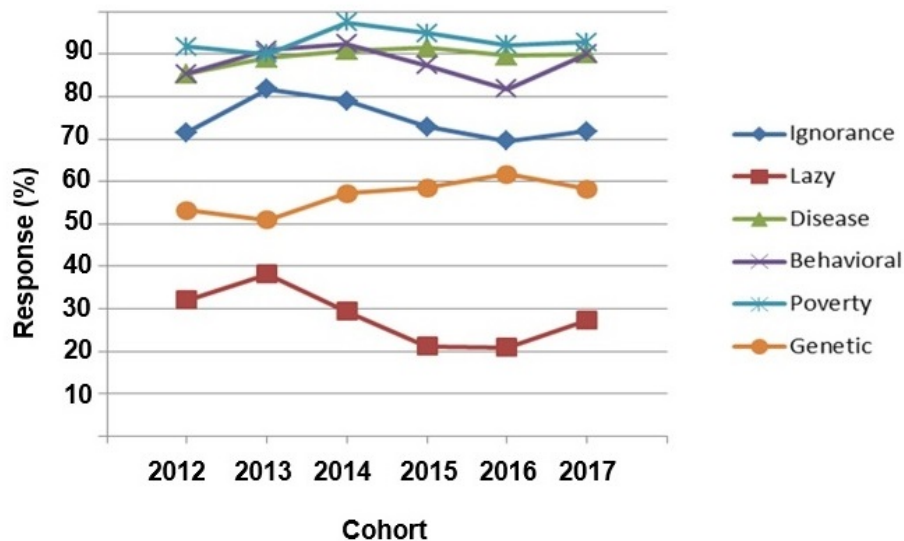
The survey taken by students after completing the IAT was designed to assess their own experiences with obesity and their beliefs about causes of obesity (see table 1). As shown in figure 2, weight problems were common. Across cohorts, 47% of students reported that they had at one time struggled with their weight (range, 43% to 54%), but only 12% had ever sought help with weight control issues (range, 10% to 15%). The majority of students (69%) reported that they had either family members or friends with obesity (range, 64% to 72%).

Figure 2. Personal Experience With Weight



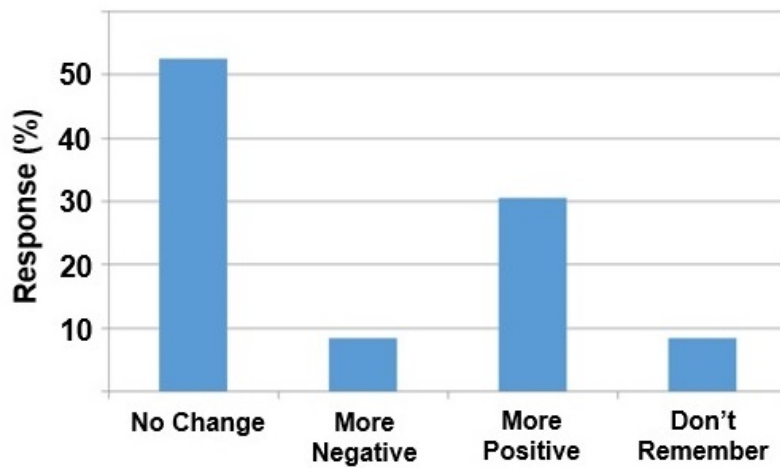
Students were also asked whether they agreed or disagreed with 6 statements regarding the etiology of obesity (see table 1, Likert scale questions). Across cohorts, 89% of students agreed or strongly agreed that obesity is a disease (range, 85% to 92%), and 89% of students believed it was behavioral (range, 82% to 92%). At the same time, over 90% of students agreed or strongly agreed that obesity results from poverty (range, 90% to 97%), and 57% believed that obesity is primarily genetic (range, 51% to 62%). Finally, 74% of students agreed or strongly agreed that ignorance contributes to obesity (range, 70% to 79%), and 28% had the opinion that people with obesity were lazy (range, 21% to 38%). While there were some fluctuations across cohorts, there was no strong trends (see figure 3).

Figure 3. Beliefs About Causes of Obesity



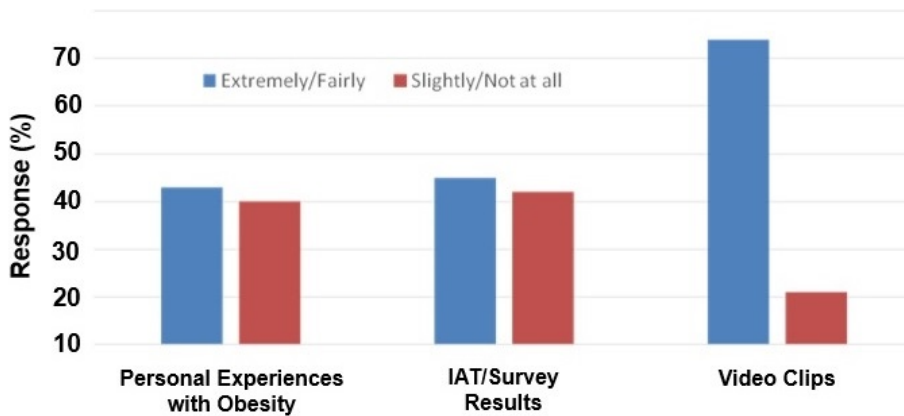
Follow-up survey. Approximately half of the 2017 cohort ($n = 59$) responded to the follow-up survey conducted in class using the iClicker system. Although 53% of respondents reported that their attitudes toward obesity did not change 4 months after the session, 30% reported positive change in their attitudes, and 10% reported more negative attitudes (see figure 4).

Figure 4. Self-Reported Changes in Attitudes Toward Obesity After Ethics Session



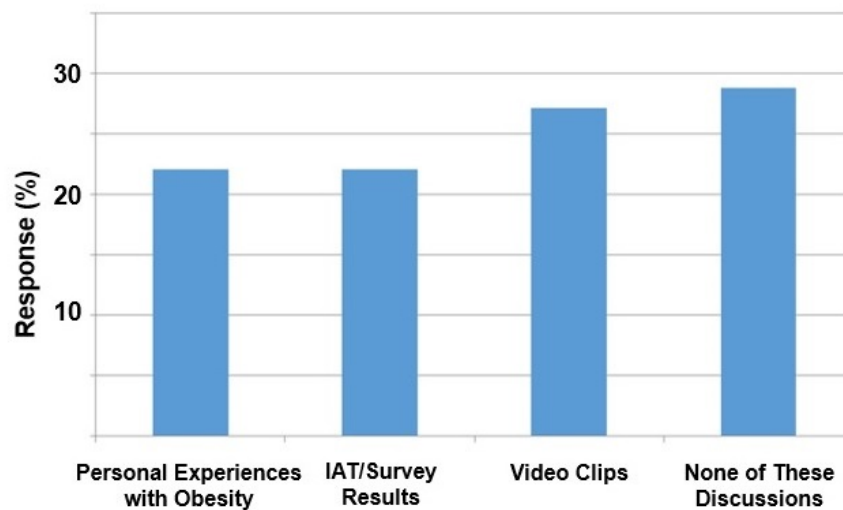
When asked what aspects of the session were particularly meaningful or useful, over 40% of all respondents thought discussing their personal struggles with weight ($n = 24$) and their class' IAT and survey results ($n = 26$) was extremely or fairly useful (see figure 5). Over 70% of respondents thought the *House* video clips were extremely or fairly meaningful.

Figure 5. Students' Perceptions of How Meaningful/Useful Was Each Component of the Ethics Session



Consistent with these findings, more students reported that the video clips were influential in changing their attitudes toward obesity than discussions about their classmates' personal struggles with weight or IAT and survey results (see figure 6).

Figure 6. Impressions of Which Discussion Influenced Attitude Change the Most



Discussion

Our study contributes to the growing literature on negative weight bias among medical students in a few ways. First, our IAT results confirm the well-described phenomenon that medical students, like physicians, hold strong negative biases against obesity and patients with obesity.⁴⁻⁸ In addition, ours is the first study to demonstrate, at least at one institution, that attitudes about obesity and beliefs about causes of obesity remained stable over 6 cohorts of first-year medical students, despite increased attention to the obesity epidemic in the literature and mass media.

Although the vast majority of our students understood that obesity is a disease with a behavioral component, a significant minority believed that laziness and ignorance play a part. This troubling finding is consistent with national data indicating that a large percentage of medical students believes lack of willpower is an important contributor to obesity.¹²

Our findings also add to the growing body of literature on educational interventions aimed at mitigating negative weight bias.¹⁷⁻²⁶ The session in which we explore students' negative attitudes toward patients with obesity is innovative in a few ways. First, it explicitly links negative weight bias to ethics. Other educational interventions designed to influence student attitudes have taken place in the context of [nutrition counseling](#) and clinical management of patients with obesity.²⁶ By integrating ethics and professionalism objectives within the nutrition course, students are encouraged to think about the ways in which discriminatory attitudes and behaviors toward patients with obesity are [unethical and unprofessional](#). Second, students are given the opportunity to reflect on their own attitudes and those of their classmates in real time. By seeing that

negative attitudes are common among their classmates, students may be better able to acknowledge their own negative attitudes. Third, our study is the first to describe the use of a popular television series about medical care to stimulate discussion and reflection about weight bias. One other study suggests that films can be useful in reducing explicit but not implicit weight bias among medical trainees.²⁵ In that study, students watched documentary films that included expert commentary about weight prejudice in health care. By contrast, our pedagogic strategy enabled students to observe, analyze, and either identify with or reject the behavior of various physician-characters. Evidence indicates that socialization during medical school—including observation of physician behaviors—exerts a powerful influence on both explicit and implicit biases.¹⁵ In our study, students seemed to value the use of, and attribute some level of attitude change to, innovative teaching tools like television and film. This finding is supported by evidence that television and movies can be effective in fostering humanistic, compassionate, and person-centered orientations in medical students.²⁹

Our study has important limitations. We only collected data from first-year medical students at one medical school. One study of negative bias among medical students has been conducted on a nationally representative sample of medical students, albeit at only one point in time.⁵ The degree to which negative attitudes toward patients with obesity remain stable across student cohorts may vary across medical schools in other geographic locations or with admissions criteria and curricula that place a higher value on eliminating negative bias. Second, the limitations of Blackboard software precluded us from examining the relationships between respondents' personal struggles with weight, their knowledge about obesity, their attitudes toward patients with obesity, and their demographic characteristics. Therefore, we cannot replicate the associations other studies of medical students have found between personal experiences with obesity, beliefs about the causes of obesity, and negative weight bias.¹³⁻¹⁶ Finally, our study was not specifically designed to evaluate the "ethics and professionalism" session and its impact on students' attitudes toward obesity. If we had set out to do such a study, we would have collected postsession data from all cohorts immediately following the session and would have used more objective attitudinal measures than self-report.

These limitations, however, pave the path for innovative future research. We know that adequate [nutrition education is lacking](#) in US medical schools, despite recommendations from educators and professional societies, and that very few schools address weight bias.³⁰⁻³² Providing students with an opportunity to discuss their personal experiences and beliefs about obesity within an ethics framework and using popular media as a basis for discussion might improve their attitudes. Future research should test these propositions in a prospective, systematic, and more representative study and explore the impact on weight prejudice of other humanities-oriented interventions such as literature, art, and written reflection.³³ As medical schools grow increasingly attuned to students' moral and professional development, consideration should be given to

combining nutrition and ethics curricula in novel ways to mitigate negative weight bias among students.

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Editor's Note

For further information about this study, please contact the author(s).

Citation

AMA J Ethics. 2018;20(10):E948-959.

DOI

10.1001/amajethics.2018.948.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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ISSN 2376-6980**

ORIGINAL RESEARCH

Produce Rx Programs for Diet-Based Chronic Disease Prevention

Haley Swartz, MPP

Abstract

Background: To explore the ethical and policy implications of produce prescription (Rx) programs, PubMed, Embase, and Scopus databases were searched for peer-reviewed literature on existing Rx programs in February 2018.

Methods: A review of the literature identified 19 articles published on produce Rx programs; all were included in the review. Inclusion criteria were interactions between a medical professional and patient in a health care setting where a prescription for the consumption of fruits and vegetables was provided. Programs were further classified by whether patients were recruited based on eligibility criteria such as low socioeconomic status, diet-related condition, and the type of referring physician. An ethical matrix was then used to evaluate well-being, autonomy, and fairness from the perspectives of adult and child patients, patient families, participating local farmers, physicians, and government assistance programs.

Results: Patients with low income were subjects of 14 articles; 13 studies identified populations with diet-related health conditions such as diabetes or hypertension. Only 9 studies examined both health conditions and low socioeconomic status. An ethical analysis indicated that despite reducing financial burdens and increasing food choice, Rx programs might have unintended psychosocial consequences on participants with low income. Health care professionals benefit from employing a partnership model of care, building trust, and emotional intelligence. Participating farmers benefit from an enlarged customer base but might experience greater financial burdens. Some produce Rx programs could use existing government assistance programs (ie, Medicaid in medically underserved areas or the Supplemental Nutrition Assistance Program, or SNAP, in food deserts), although disbursement may be cost inefficient and disorganized without policy cohesion at all levels of government.

Conclusions: Future research must test a variety of produce Rx program designs to ameliorate tradeoffs between well-being, fairness, and autonomy. As pilots grow in scale, produce Rx programs must acknowledge the critical roles and perspectives of health care professionals and local participating farmers. Programs must also determine whether Rx incentives will use the existing government assistance programs to identify patients with low income, with diet-related health conditions, or with both.

Preventative “Prescription” Programs for Fruits and Vegetables for At-Risk Patients

Across the country, local partnerships between farmers’ markets, community health clinics, community based organizations (CBOs), and research institutions have piloted numerous produce “prescription” (Rx) programs. In these programs, physicians identify at-risk patients—either by a diagnosed diet-related health condition (such as diabetes, obesity, or celiac disease), a qualifying income level, or both—and write prescriptions for the consumption of subsidized nutrient-rich foods, including fruits and vegetables (FVs). Produce Rx programs use monetary incentives to reduce the social cost of attitudinal change (ie, altering preferences through nutrition education) and the financial cost of behavioral change (ie, subsidizing healthy foods for consumers with low income). The cost of the FVs is subsidized by stakeholder groups, such as research institutions and CBOs, or through private, local, or state grants. At this time, the federal government has proposed \$4 million for produce Rx pilot programs for each fiscal year 2019 through 2023 in the Agriculture Improvement Act of 2018.^{1,2}

Produce Rx programs are unique among preventative interventions in using a [partnership model of care](#) whereby an authority figure (ie, the referring physician) rewards and positively reinforces repeated health-seeking behaviors.^{3,4} The interplay between patients’ financial incentives and the physician-patient relationship is central to the structure of produce Rx programs. As a result of the relative youth of such programs in preventative medicine, no known research to date has considered the varied perspectives of involved stakeholders or the programs’ ethical implications.

This article aims to (1) review the academic literature on published accounts of existing produce Rx programs and their stakeholders and (2) use an ethical matrix to evaluate the ethical implications of produce Rx programs and their potential scale-up in state and federal policy.

Methods

PubMed, Embase, and Scopus databases were used to search the peer-reviewed literature on existing Rx programs in February 2018. In this review, inclusion criteria were at least 1 interaction between a medical professional and patient in a health care

setting where a prescription for the consumption of fresh, canned, or frozen fruits and vegetables was issued.

Six stakeholder groups were identified. The analysis separated patients into 3 subcategories: adult patients, child patients, and patient families, including those both with and without children. Health care professionals and local participating farmers are included in this analysis as they are critical to program design. Lastly, although government assistance programs are not yet *participating* in produce Rx programs, the rapidly growing research on such programs is of *interest* to agencies seeking new incentive models to promote health and nutrition among beneficiaries. As a result, social services relevant to produce Rx programs include food and nutrition benefits (ie, the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) health care insurance (ie, Medicaid and Medicare), and income assistance (ie, Temporary Assistance for Needy Families (TANF)).

The 6 stakeholder groups identified in the review were then used to form an ethical matrix (EM), or an analytical tool that evaluates the ethical considerations of several policy alternatives from the perspective of 4 or more stakeholders.⁵ Mepham identified 3 standard principles relevant to stakeholders with an interest in a certain set of public policies, including well-being (maximizing benefits and minimizing harms), autonomy (freedom and choice), and fairness (reducing disparities resulting from socioeconomic status or health condition).⁶ EMs evaluate policies with respect to these 3 criteria and are divided by stakeholder group. Each cell in an EM represents beneficial or harmful outcomes from the perspective of a stakeholder group, depending on traditional power dynamics, expected impacts, and the specific contexts and communities where programs are implemented.

Article Characteristics

A total of 19 articles are included in this review.⁷⁻²⁵ Fourteen articles evaluated the impact of produce Rx programs, including 10 peer-reviewed articles and 4 conference abstracts (see table 1). Five articles—1 study and 4 commentary pieces—were qualitative descriptions of the organizations or systems that operate and facilitate produce Rx programs.

Of the 19 articles, 14 featured patients of low socioeconomic status (SES) at either federally qualified health clinics (FQHCs) or community health clinics (CHCs); 12 identified a specific population with a diet-related health condition; and 9 featured both. Five articles described food environments outside the United States, including Italy and the United Kingdom. All of the 14 evaluative articles were observational or quasi-experimental studies. Study design varied, with 8 retrospective cohort studies, 3 prospective cohort studies, 2 qualitative evaluations, and 1 cross-sectional study.

Average study duration was 11.6 weeks, with a range of 4 to 22 weeks. Studies occurred at various times during the year, including both winter and summer months.

Table 1. Published Evaluations of Produce Rx Programs by Rx Type, Design, and Participant Characteristics

Source	Time	Study Design	Food Retail	Rx Design	Participant Inclusion Criteria			
					Patient Type (N)	Low SES	Diet-Related Condition	Physician Referral
Peer-Reviewed Articles								
Blickenderfer, 2016	NR	Qual (thesis)	CG	Discounted 5 lb FV bag per mo in CSA	Adult (12)			GP, CHW
Bryce, 2017	13 wk	Retro cohort	FQHC onsite FM	\$40 voucher (\$10/wk over 4 wks)	Adult (65)		Diabetic	GP
Buyuktuncer, 2014 ^a	4 wk	Prospect cohort	Local grocery	£1 discount for £3+ spent on FV/week	Adult (124)	X		GP, NP, midwife
Cavanagh, 2017	13 wk	Retro cohort	Mobile market	Booklet of 13 coupons for 1 wk of FV, or \$7 value	Adult (54)	X	Hypertensive, obese, and/or diabetic	CHW
Friedman, 2014	22 wk	Retro cohort	FQHC onsite FM	Preprinted "prescription" (\$5 coupon). Bonus \$25 and \$40 at pre-, mid-, and post-study	Adult (44)	X	Diabetic and/or obese	GP, NP, social worker
George, 2016	8 wk	Retro cohort	FQHC onsite FM and CG	\$50/wk voucher	Child (22) Family (4)	X	Overweight and/or obese	Medical students
Goddu, 2015	NR	Retro cohort	FM or local grocery	Either \$5 coupon off \$20 purchase at 9 Walgreen's or \$10 voucher at FM	Adult (NR)	X	Diabetic	CHW, GP
Kearney, 2005 ^a	NR	Prospect cohort	See Buyuktuncer, 2014		Adult (NR)	X		GP, NP, midwife
Muhammad, 2017	NR	Cross-sectional	Pharmacy or local grocery ^b	UK program ^b for Coeliac patients to obtain GF foods, either free or with small charge (£8.60)	Adult (375)		Celiac	GP, RD
Trapl, 2016	16 wk	Retro cohort	FMs	\$40/mo voucher	Adult (75)	X	Pregnant < 24 wk gestation	CHW, midwife, RD, patient advocate
Conference Abstracts								
Chrisinger, 2016	16 wk	Prospect cohort	FMs	\$10/wk voucher for FV	Child (NR) Family (353)			Pediatrician, GP
Joshi, 2016 ^c	12 wk	Retro cohort	FMs	\$10/wk voucher for FV	Adult (224)	X	Hypertensive	Pharmacist, medical assistants
Omar, 2016	8 wk	Retro cohort	FQHC onsite FM	Rechargeable debit card (\$ value NR)	Adult (6)	X	Obese and/or diabetic	RD
Schlosser, 2016 ^c	NR	Qual ^d	FMs	Thematic results: Rx program enthusiasm; increased FV intake; economic hardship; comorbidity; social interactions; beliefs about patient agency	Adult (23)	X	Hypertensive	GP, CHW

Abbreviations: CG = community garden; CHW = community health worker; CSA = community-supported agriculture (in-kind); FM = farmer's market; FQHC = federally qualified health center; FV = fruits and vegetables; GF = gluten-free; GP = general practitioner; lb = pound; mo = month; NP = nurse practitioner; NR = Not reported; Prospect = Prospective; Qual = qualitative; RD = registered dietician; Retro = Retrospective; SES = socioeconomic status; wk = week.

^{a,c} Two published accounts of the same study.

^b In most of the United Kingdom (UK), patients diagnosed with celiac disease can receive gluten-free staple foods through a federally-funded program once prescribed by their GP. Prescriptions are free of charge for children throughout the UK. In Wales, Scotland, and Northern Ireland, prescriptions are free for all patients. In England, each prescription charge costs £8.60 unless income qualifies for reduced or free rates.

^d The study design was semi-structured interviews.

Rx Type and Design

Five Rx types were identified based on the support of food retail. Farmers' markets (FMs) were the primary source of food for study participants, including onsite FMs at the FQHC or CHC where the physician-patient interaction occurred (n = 4), as well as local, participating FMs (n = 5). Grocery stores were either locally owned (n = 1) or a local branch of a national store (n = 1). Other retail included community garden (CG; n = 2) and mobile market (n = 1). Two studies gave participants a choice of where to shop—at an FM and a CG or a participating grocery. Nine of the programs were subsidized using vouchers. The dollar value of the incentive varied between \$10 and \$50 per week.

Participant Characteristics

Table 2 provides a summary of characteristics of participants in all studies. The most common clinician was a general practitioner or primary care practitioner (n = 12), followed by a community health worker (n = 7), and a registered dietician (n = 5). Most articles (n = 10) used a household income at or below the poverty level for recruitment. Obesity and diabetes were the most common noncommunicable disease criteria (n = 5), followed by hypertension (n = 3), and celiac disease (n = 2).

Table 2. Summary of Participant Characteristics in Evaluation and Qualitative Studies

Characteristics	No. (% of Total)
Health Care Professional^a	19 (100.0)
General practitioner or primary care clinician	12 (63.2)
Community health worker	7 (36.8)
Registered dietician	5 (26.3)
Pediatrician	3 (15.8)
Midwife	3 (15.8)
Nurse practitioner	3 (15.8)
Pharmacist, pharmacy technician	2 (10.5)
Medical student	1 (0.1)
Patient advocate	1 (0.1)
Social worker	1 (0.1)
Specialist	1 (0.1)

Determination of SES Eligibility^b	14 (73.7)
At or below poverty level, or otherwise low income	10 (52.6)
Medically underserved populations	4 (21.1)
Enrollment in SNAP	2 (10.5)
Food insecurity Experience questions	1 (0.1)
Enrollment in WIC	1 (0.1)
Health Condition^c	13 (68.4)
Obesity	5 (26.3)
Diabetes	5 (26.3)
Hypertension	3 (15.8)
Celiac disease	2 (10.5)
Pregnancy	1 (0.1)
Use of Government Assistance Programs	5 (26.3)
Participants who paid for FV (after redeeming incentive) with SNAP benefits ^d	2 (10.5)
Participants who were enrolled in Medicaid ^e	3 (15.8)
<p>Abbreviations: SES = socioeconomic status; SNAP = Supplemental Nutrition Assistance Program; WIC = Women, Infants, and Children Federal Nutrition Assistance Program.</p> <p>^a Most studies partnered with multiple clinicians (n = 17).</p> <p>^b Most studies used more than one method to determine SES eligibility (n = 10).</p> <p>^c Some studies recruited participants with multiple diet-related health conditions (n = 4).</p> <p>^d The only 2 articles that explicitly indicated SNAP benefits were used within the study were Goddu et al.¹⁶ and Trapl et al.²⁴ This number is likely higher, as growth of SNAP and WIC Farmers' Market Nutrition Programs have allowed most FMs to purchase and operate the technology to support EBT card transactions.</p> <p>^e No studies used enrollment in Medicaid as a measure of eligibility. Three studies (Bryce et al.,¹⁰ Cavanagh et al.,¹² Goddu et al.¹⁶) included descriptive statistics about Medicaid enrollment.</p>	

Stakeholder Groups

The ethical matrix comprising the 6 stakeholder groups and 3 ethical considerations appears in Table 3. The + and - symbols refer to potential outcomes (benefits and harms, respectively) as a result of produce Rx programs.

Table 3. An Ethical Matrix of Produce Rx Programs

Stakeholder	Ethical Implications of Rx Programs, by Potential Benefit (+) and Harm (-)		
	Well-Being	Autonomy	Fairness
Child patients	+ Initiating interventions early in life enhances health-promoting behaviors	+/- Tests attitudinal change in a choice-protected and choice-constrained environment	+ Lower food costs reduce financial barriers to healthy food procurement - Negative feedback loops and coupon stigma
Adult patients	+ Promotes consumption of healthier foods to ameliorate existing or high-risk poor health outcomes	+ Informed consumer choice in purchasing nutrient-rich foods	
Patient families	+ Higher adherence and greater social acceptability among family-based interventions	- Program can restrict locations and budgets for grocery shopping	
Health care professionals (all)	+ Nonpharmacological intervention initiates deeper and more personal engagement with patients	+ Firsthand experience employing partnership model of care (ie, role modelling)	+/- Resources may not be prioritized for programs in FQHCs/CHCs
Local participating farmers	+ Larger customer base improves income, livelihoods - Profits can vary with seasonality	- Onsite FM at FQHCs/CHCs can reduce choice in market location, increasing transport, storage costs + Redemption at local FMs	+/- Incentive cost can be program prohibitive, unless otherwise covered
Government assistance programs	+ Enlarges evidence base for integrating prevention and treatment in public policy (health care, food access, income)	- Cost-inefficient, disorganized disbursement of incentives - Rx dollar value affected by political budget negotiations	+/- Integration of public services for food deserts and medically underserved areas/populations

Patients. Children are dependent on adults for both the physical provision of food and the less tangible components of food choice, including cooking knowledge and grocery shopping. This is particularly true for children with diet-related health conditions who are vulnerable to the cognitive, psychosocial, and physiological effects of poor nutrition, as well as teens and adolescents who independently form their own food behaviors. Produce Rx programs hoping to recruit children have potential to enhance health-promoting behaviors and attitudes early in life. These programs simultaneously protect and constrain food choices, which results in either resistance or eagerness to change behavior, particularly among teenagers. The extent of family involvement as well as children’s age and gender affects their responses.^{26,27} Substantial evidence also indicates that food choice interventions are more successful in both the short- and long-term when family-based approaches are used.^{28,29}

Among adult patients, produce Rx programs promote consumption of nutrient-rich foods that can ameliorate existing or [high-risk diet-related health conditions](#). Compared to children, parents or caregivers who receive the Rx have both a larger knowledge base and a greater set of choices in purchasing nutrient-rich foods. However, as the results of this review show, produce Rx programs by design must restrict the locations available for participants to partake in grocery shopping, limiting choices to what is available at an onsite FM or local grocery.

Research on customer experience with store cashiers has found reinforcing feedback loops between feelings of embarrassment, perceived discrimination, and low long-term coupon redemption rates, or coupon stigma.³⁰ This psychosocial effect is particularly strong in grocery stores, where the “devaluation effect” can supersede expected cost savings for consumers of low SES.³¹ The Electronic Benefit Transfer (EBT) card replaced paper vouchers in 2004 for SNAP beneficiaries, partially to reflect technological change and to reduce the stigma of identifiable stamp usage.³² Future produce Rx designs must consider the role of coupon stigma and the potential usefulness of EBT.

Health care professionals. The 11 health care professionals identified in Table 3 reflect a variety of experiences and career stages. By design, Rx programs provide physicians of all levels an opportunity to prescribe a nonpharmacological intervention. Unlike most medications, prescriptions of nonpharmacological treatments require the collection of qualitative data, including patient expectations and experiences.^{33,34} Repeated interactions through follow-ups tend to enhance physician’s emotional intelligence, communication skills, and patient trust.³⁵

Produce Rx programs provide an alternative to the paternalistic model of the physician-patient relationship.³⁶ The partnership model assumes mutual participation, whereby health care professionals and patients are colleagues in pursuit of improved health as a shared goal.³⁷ Physicians, regardless of experience level, were described in some of the 19 studies reviewed as providing mentorship (n = 1), role modelling (n = 2), and counseling (n = 3).

Only a few Rx programs were implemented in medically underserved areas (MUAs), or communities in which preventative care services are unavailable to low-income, vulnerable groups (eg, rural communities, non-English speaking minorities).³⁸ Physicians who treat medically underserved populations (MUPs) operate at a near-constant level of resource constraint, including unpredictable budgets and insufficient administrative personnel. These constraints may be exacerbated by an additional preventative program.

Local participating farmers. Recent evaluations indicate that financial incentives at FMs benefited local participating farmers, increasing revenue³⁹ and community engagement.⁴⁰ However, redemption rates tended to be greatest during the summer and

fall months. Furthermore, produce Rx programs represent an additional source of income beyond a local food producer's presence at FMs. These programs can may be unreliable from one season to the next, covering only a few weeks or months. While still in pilot phases, produce Rx programs might not recur, contributing to economic instability among local food producers.⁴¹

Some of the produce Rx programs in this review attempted to ameliorate the transportation barriers faced by patients with low income by providing an onsite FM (see table 1). However, the reduced transaction costs for patients may have the unintended consequence of increasing fixed costs for farmers. These costs include an increase in transport and storage costs that pose time constraints and restrict choice of market locations. Other produce Rx programs provide an incentive coupon for redemption at local FMs, ameliorating these cost issues.

Participating farmers are most impacted by the cost structure of the incentive—how it is funded, subsidized, or otherwise covered by program partners. In this review, some studies covered the cost of the incentive in the research budget. But the majority of studies did not report who bore the cost burden of the incentive. The farmers who are forced to internalize the cost of subsidized produce may be unable to participate in any incentive program.

Government assistance programs. As shown in table 2, most existing programs did not work with the assistance programs and systems in place for beneficiaries with low SES despite using SES as a primary eligibility criterion. Produce Rx programs that seek to enroll participants with low SES could make greater use of existing public assistance systems through which incentives could be disbursed, such as SNAP and Medicaid, thereby enlarging public data on the complex intersections between health care, food access, and income. However, administration of federal programs—including determination of participant eligibility, funding, and bureaucratic functions—varies between states and localities. Without substantial policy cohesion from federal to municipal levels, any produce Rx program is likely to be cost inefficient and disorganized, as well as subject to the politics of annual budget negotiations.

Most studies used the umbrella term “low-income” to identify participants (see table 3). As Rx programs grow, clinicians must become systematic in selecting participant eligibility criteria. One solution is using the federal government's systems for defining low-income by “who” and “where.” The designers of produce Rx programs could identify the overlap between geographic areas or communities defined by the US Department of Agriculture for SNAP and WIC (food deserts) and by the Department of Health and Human Services for Medicaid and Medicare (MUAs, MUPs). However, the complexities of government assistance implementation remain, and procedures must be enacted to modify varying state and local systems.

Conclusions

Compared to other diet-related preventative interventions, produce Rx programs are relatively young. The majority of studies identified in this article were private or small-scale pilots that enrolled a small sample of eligible patients. The author knows of no published studies based on randomized controlled trials that test the effects of varied Rx designs and program structures on outcomes. More research is necessary to evaluate the Rx prescription model with respect to a variety of independent variables, such as (1) standard medical measurements of diet-related health indicators, including body mass index, Hb1AC levels, and blood pressure and (2) evaluations of attitudinal and behavioral change, including whether there is a positive relationship between the dollar value of redeemed incentives and improvements in both nutrition outcomes and confidence in food preparation skills. Other variables to be tested include variations in eligibility criteria, prescription type (coupon, CSA, voucher) and dollar value, timeline of redemption, extent of nutrition education associated with the prescription, integration with federal assistance programs, use of electronic medical records to inform prescription type, and food retail location(s) accepting the prescription in place of a monetary exchange.

This review also found that no programs are yet linked to federal assistance program systems, including Medicaid, SNAP, and WIC. Policymakers should consider whether to replace the prescription with an EBT card or a more discreet incentive to ameliorate potential coupon stigma concerns. Further research must determine whether a prescription remains effective if it only provides guidance, instructions, recipes, or servings of seasonally available foods rather than serving the purpose of a financial exchange.

Cost appears to be a primary policy barrier to scaling up produce Rx programs nationwide. Results from this review indicated that other stakeholders or grants provided the funds to subsidize the FVs, but varying program design could leave local participating farmers at risk of bearing the cost burden. As produce Rx programs begin to grow in size and scope, researchers, clinicians, and other health care stakeholders should partner to design the incentive structure, acknowledging the critical role played by physicians, local participating farmers, and government assistance programs.

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Editor's Note

For further information about this study, please contact the author(s).

Citation

AMA J Ethics. 2018;20(10):E960-973.

DOI

10.1001/amajethics.2018.960.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

POLICY FORUM: PEER-REVIEWED ARTICLE

Health Professionals as Partners in Values-Based Food Procurement

Sarah Reinhardt, MPH, RD and Ricardo J. Salvador, PhD, MS

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Abstract

Health professionals have the opportunity and responsibility to apply their expertise to address the current trajectory of chronic disease in the United States. Half of American adults have one or more preventable chronic diseases, many of which are diet related, so it is critical that health professionals engage in public health prevention strategies. These can take the form of public and private sector partnerships. Food procurement—the processes through which institutions such as hospitals and schools purchase and serve food—offers powerful opportunities for health professionals to partner with public institutions to prioritize accessibility to nutritious, sustainable, and fairly produced food and to generate sustained benefit to population health.

Opportunities for Clinicians to Serve as Food Procurement Advocates

Professional codes of ethics articulate the responsibilities of health professionals to communities and society and inform decisions clinicians make during the course of treating a patient. The American Medical Association (AMA) Principles of Medical Ethics states: “A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and betterment of public health.”¹ As social and environmental determinants increasingly pose the greatest threats to population health rather than acute events and illnesses, the principles that guide responsible engagement with the local community and environment become of greater consequence and import. How these principles are applied in practice is at the discretion of the health professional, who must respond to the question, What are the most effective and strategic actions we can take to strengthen our commitment to improving public health?

Physicians and other health professionals have a unique opportunity to engage in [partnerships with public and private sector organizations](#) to prioritize disease prevention and encourage shifts in the systems that presently contribute most to diet-related

chronic diseases and health disparities. Primary among these is our food system—a complex network of practices and policies that determines how food is produced, distributed, and consumed and that exerts immeasurable influence on the social determinants of health. By and large, the prevailing system works against, rather than with, public health: it creates a food supply and a culture that undercut dietary recommendations; it relies on resource-intensive industrial agricultural practices that degrade natural resources and threaten the future availability of food; it [exploits a large labor force](#), leaving many who produce our food with inadequate access to it; and it is plagued by racial and socioeconomic inequity that compounds disparities in health and economic opportunity.²⁻⁵ To act as agents of change within this system, health care professionals can begin with their own institutions, which provide food to their staff, patients, clients, and communities.

Institutional Food Procurement Policies as Public Health Strategies

Noncommercial food service operations, including [hospitals](#), senior care centers, and other health care facilities, supply about \$120 billion worth of food each year to some of the nation's most vulnerable populations.⁶ *Food procurement*, the process by which these institutions purchase raw and prepared foods and beverages, is a valuable tool to prioritize accessibility to foods that are not only nutritious but also produced in a way that upholds the principles of equity and sustainability throughout the supply chain. Hospitals around the country have already begun to leverage their purchasing power to this effect: to date, more than 580 facilities have signed the Healthy Food in Health Care pledge,⁷ signaling a commitment to practices such as increasing access to more nutritious and responsibly produced food through [onsite farmers' markets](#) and gardens, integrating environmental sustainability standards into food service contracts, and prioritizing the purchase of local foods. Many hospitals are also mitigating climate impacts of industrially produced meat by reducing portion sizes, serving more plant-based proteins, and purchasing meat from farms employing more sustainable and regenerative agricultural practices, such as crop diversification and integrated livestock management.⁷

Although food service operations in health care facilities may be the most intuitive place for health professionals to support procurement efforts, other public institutions such as schools and city or county departments offer opportunities to implement procurement policies or initiatives with far-reaching impacts. One of the most comprehensive food procurement policies to date, the Good Food Purchasing Policy (GFPP), has been adopted by a number of public institutions with demonstrated success.⁸ The GFPP awards certifications to participating public institutions such as schools, hospitals, and county departments based on their procurement practices and provides a set of transparent, flexible metrics-based standards and benchmarks to help facilitate and track their progress. As we have described elsewhere,⁸ 5 key “value categories” provide the foundation of this procurement framework: (1) local economies, (2) environmental

sustainability, (3) nutrition, (4) valued workforce, and (5) animal welfare. Codifying these values through food procurement allows institutions the opportunity to offer more nutritious foods to the populations they serve while also supporting community health by exerting a positive influence on some of its broader social determinants.

In 2012, the Los Angeles Unified School District became the second institution to adopt GFPP, following the city of Los Angeles.⁸ The policy has helped the district, which has a student population of 640 000 and an annual food budget of \$150 million, direct 20% of its budget to local purchases, develop healthier school menus, achieve reductions in its carbon footprint and water usage, and secure higher wages and better working conditions for 165 workers in a major food distribution company.⁸ The GFPP was subsequently adopted by the San Francisco Unified School District and Oakland Unified School District in 2016 and by the Chicago Public Schools in 2017.⁸ Active campaigns for adoption of the program are now underway in Austin, Cincinnati, Denver, Madison, New York City, the Twin Cities, and Washington, DC.⁸

Health Professionals as Agents of Change

Securing administrative and procedural changes in a food service facility requires support and commitment from a range of stakeholders. In the case of the policies named above, diverse coalitions of institutional leaders, food service staff, dietitians, physicians, farmers, union representatives, and animal rights activists have played an instrumental role in communicating the importance of these initiatives to the general public and in working with local leaders and elected officials to codify them.⁸ Such broad coalitions are essential in advocating for food systems that better serve public health, and health professionals play a vital advocacy role within them. It is only logical that physicians, dietitians, and other health care practitioners be fully supportive of such initiatives—particularly within the walls of their own institutions. The ethical standards by which health professionals abide must be sufficiently comprehensive to encompass the notion that the food served in medical establishments and other major public institutions should be health promoting, should be consistent with evidence-based dietary recommendations, and should not contradict the very aim of medical treatment or intervention.⁹ Procurement as a public health strategy is doubly compelling when one considers the economic logic. Research has demonstrated that disproportionate benefits result from investments in public health prevention: for each dollar invested in prevention, an estimated \$5.60 of health care spending is saved.¹⁰ Using existing institutional food budgets to promote public health prevention efforts, such as healthy food procurement, benefits not only patients but also health care practitioners and facilities with limited resources.

Conclusion

The challenges facing our food system, including lack of healthy food access and affordability, strain on natural resources and food production systems, and the

persistent inequity and economic inequality embedded in the food chain, pose significant and urgent threats to population health. Addressing this broad spectrum of issues will require systemic prevention strategies that bring public and private sector partners into alignment with prevention-based public health strategies. Health professionals have a vital role to play in these efforts, particularly in leading and participating in food procurement initiatives that leverage the food budgets of large institutions in a manner consistent with their health-promoting missions by prioritizing food purchases that can contribute to a more healthful, equitable, and sustainable food system. Transforming the food system so that it works for public health is one of the most powerful and underutilized intervention points in this field. Failure to act on this intervention point could well contravene the Hippocratic principle that broadly governs medical ethics: do no harm. Given the current state of public health—and what might prove to be a critical junction in health care practice—it is essential that [health professionals act as leaders](#) in advocating for and implementing strategies that promise to deliver sustained well-being to the population.

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Citation

AMA J Ethics. 2018;20(10):E974-978.

DOI

10.1001/amajethics.2018.974.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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ISSN 2376-6980**

POLICY FORUM

Does Global Goal Setting Matter for Nutrition and Health?

Jessica Fanzo, PhD

Abstract

The United Nation's Sustainable Development Goals (SDGs) mark an important moment for the world to improve human capital through nutrition and health goal setting. While the Millennium Development Goals contributed to the reduction in the number of undernourished people, the agenda remains unfinished. We are at a crucial crossroads with malnutrition burdens and hunger not decreasing as fast as they should and sometimes increasing. There is a moral imperative to act on the SDGs for nutrition, and health systems and professionals working in those systems have significant roles to play in fulfilling the objectives set out by the goals—that is, in ensuring that all citizens have a chance to achieve their own development.

Setting Global Goals for Nutrition

Setting global goals serves as a policy tool for promoting cooperation within the international community. Their main purpose is to draw attention to neglected priorities that the world should care about and to make achieving those goals a reality. Global goals are not treaties with binding obligations. They are not intended to be “implemented” by a world authority as planning targets might be. Instead, they set out priority agendas and frameworks for evaluating overall progress and for guiding efforts.¹

Global goals do matter. They provide an incentive for countries to be bold and ambitious in their commitments to their citizens. They establish a common framework that global leaders agree is important. They bring partners to work on “wicked” challenges and provide a platform where donors can invest in things they care about. They can be essential for mobilizing stakeholder networks and funding, creating peer pressure, and spurring epistemic communities—networks of expertise, knowledge, and practice—into action on agreed-upon challenges.²

The Sustainable Development Goals (SDGs) are such a policy tool. As I have written elsewhere, “With the approval of the ... SDGs at the UN General Assembly in New York in September of 2015, we said goodbye to the Millennium Development Goals (MDGs), assessed our past achievements, and worked towards a broader, bolder set of targets that will steer our world onto a new path of sustainable development.”³ The SDGs and

the MDGs are global agendas with set goals, targets, and indicators to measure progress pertaining to core areas of development among nations. Three major goals of the SDGs directly relate to nutrition: SDG1, SDG2 and SDG3 (see figure 1). SDG1 is the overall poverty goal; SDG2 is the hunger and nutrition goal; and SDG3 is the health goal.^{4,5} Many of the other 14 goals indirectly relate to nutrition and diet by targeting areas such as [climate change](#) and natural resources, education, and women’s empowerment, for example. The inclusion of nutrition in the SDG agenda is of critical importance to continue the progress made during the MDG era (2000-2015). While much was achieved, the MDGs fell short of accomplishing their objective of eradicating undernutrition. The final year of the MDGs indicated that the proportion of undernourished people in developing regions had fallen by almost half from 1990-1992 to 2015-2016—from 23% to a projected 13%—and that the proportion of children under 5 who are underweight declined during the same period, although at unequal rates and not everywhere.⁶

Figure 1. The SDGs Directly Related to Nutrition^a

<p>Target 2.1: “By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round”⁴</p> <p>Indicators⁴:</p> <ul style="list-style-type: none"> • 2.1.1: “Prevalence of undernourishment” • 2.1.2: “Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)” <p>Target 2.2: “By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons”⁴</p> <p>Indicators⁴:</p> <ul style="list-style-type: none"> • 2.2.1: “Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age” • 2.2.2: “Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)” <p>Target 3.4: “By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being”⁵</p> <p>Indicator⁵:</p> <ul style="list-style-type: none"> • 3.4.1: “Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease”
<p>^a Content from United Nations.^{4,5}</p>

Evaluating the MDGs and SDGs

Lessons were learned from the MDG era and the goal-setting process itself. First, some might argue that the MDG agenda was too narrow in scope to capture the full range of important global priorities for development and that the focus was more on [eliminating poverty](#) for those countries struggling with low resources, not on sustainable development goals for all countries. For this reason, the MDGs set the bar quite low for middle-income and high-income countries where the poverty goals had already been met. Second, in formulating the MDGs, the process was not inclusive; some felt the formulation of the MDGs was faulty because of inadequate consultation by governments, social movements, and other development players. Third, there were also controversies about the formulation of the targets themselves.⁷ The one-size-fits-all targets that were agreed upon at the global level did not always make sense at the country level, as priorities are context dependent. Fourth, the methodology for defining targets was arbitrary and inconsistent, often leaving reporting channels and mechanisms less clear.⁸ Finally, many experts felt that the MDGs failed to incorporate important [human rights principles](#) and standards such as equality and nondiscrimination, participation, and accountability.^{9,10}

By contrast, the process of developing the SDGs was much more inclusive, involving many stakeholders across the world. For this reason, the SDGs encompass major global challenges such as climate change, conflict, and governance.¹¹ In addition, every country must work to achieve the goals. Not one country is immune to the process. The MDGs focused mainly on developing countries to create a razor-sharp focus on poverty reduction. The SDGs, by contrast, are designed to be transformative and aspirational, with a focus on human rights and leaving no one behind.¹²

However, the widened scope of the SDGs has been criticized. First, the term “sustainable” is not fully agreed upon, which leaves the paths towards sustainable development open to interpretation. Second, many experts believe the SDG agenda has too many goals and targets but still leaves things off the agenda.¹³ The thinking is that if you have too much on an agenda, you are left with everything being a top priority, which can mean nothing is a priority.¹⁴ Third, some goals do not have measurable, set targets or have missing indicators, making them difficult to track over time and weakening the call for accountability. Some have argued that the current set of targets is unactionable, unquantifiable, and unattainable.¹⁴ Finally, achieving some SDGs will have negative impacts on other SDGs.^{15,16} For example, economic growth does not always lead to improvements in nutrition and can sometimes have negative impacts, such as a rise in obesity. The possibility of negative impacts makes it much easier for countries to “opt out,” leaving the goals voluntary at best. However, the original intent was that the goals could be modified upon demand for “different national realities, capacities and levels of development and [would] respect policy space and priorities.”¹¹

Multiple Burdens of Malnutrition

We still are dealing with very high burdens of food insecurity and undernutrition; 23% of the world's children under the age of 5 are affected by stunting.¹⁷ In addition, 815 million people go to bed hungry.¹⁸ Overweight and **obesity**, however, are major risk factors of noncommunicable diseases (NCDs), and obesity trends are not moving in the right direction. Currently, a staggering 2.1 billion people suffer from overweight and obesity globally and, of these, an estimated 41 million children under 5 years of age are overweight.^{17,20} These growing rates of overweight and obesity worldwide are linked to a rise in NCDs—life-threatening conditions that are overburdening health systems and medical professionals.

NCDs are currently the most common cause of death and disability worldwide, accounting for 68% of global mortality, or 2 out of every 3 deaths.^{19,21} Of the 38 million deaths due to NCDs in 2012, 16 million or 42% were premature (ie, before the age of 70) and largely avoidable—up from 14.6 million in 2000.¹⁹ Almost 75% of NCD deaths occur in developing countries.¹⁹ Higher death tolls are also associated with poorly functioning health systems in many low-income and middle-income countries.

The multiple burdens of malnutrition are wreaking havoc on health systems and our capacity to move towards more sustainable development. One could argue that having a set of common goals to address these burdens is not only essential but also a moral obligation.²²

Tracking Health and Nutrition Goals

What the MDG commitments did do was provide the momentum for countries to track progress toward globally agreed-upon poverty reduction targets, which included reducing hunger and undernutrition.¹⁰ Moreover, because at that time communicable diseases were tearing apart many of these countries,²³ the MDG agenda also allowed for significant investments in communicable diseases such as HIV/AIDS and tuberculosis, which helped bolster health systems in many low-income countries.⁶ What the MDGs did not pledge to do was track more meaningful indicators of undernutrition—stunting and wasting—which are more actionable indicators for tracking both chronic and acute malnutrition. By contrast, the SDGs include both stunting and wasting as primary indicators to be monitored over the next 15 years (see figure 1).³

During the era of the MDGs, slowly and insidiously, NCDs—mainly cancer, cardiovascular disease, chronic respiratory diseases, and diabetes, along with overweight and obesity—were increasing among populations almost everywhere. Virtually no country remained untouched.²⁴ The burden of overweight and obesity and NCDs was completely ignored in the MDG agenda. But now this has changed. Childhood overweight is an indicator in SDG2 and an NCD reduction target is embedded in SDG3.¹¹ Thus improved health systems could be seen as an opportunity for easier entry points in treating complex,

chronic diseases such as NCDs.³

Recognition of NCDs as part of the SDG agenda aligns well with other goal-setting agendas, including the World Health Organization (WHO) Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition,²⁵ as well as the 6 global nutrition targets 2025 and the 9 global targets on NCDs established by the 2013 World Health Assembly.²⁶ Furthermore, in November of 2014, governments committed to ending hunger and malnutrition in all its forms at the Second International Conference on Nutrition.²³ However, key indicators to measure the multiple burdens of malnutrition, their risk factors, and outcomes were left off the SDG agenda. Astonishingly, there is still no target or indicator to track overweight and obesity in adults. In addition, there are no indicators or targets for **exclusive breastfeeding** and diets, both important contributors to nutrition outcomes.³ Nevertheless, the SDGs are critically important to countries, probably more so than the other aforementioned commitments and targets, as the negotiations for the SDGs were set out by countries themselves and, over the first 3 years, most countries have established plans to achieve at least some, if not all, relevant SDGs.

Ethics of Goal Setting and Making Goals Matter

If countries want to make a dent in the multiple burdens of malnutrition and attempt to achieve the SDGs related to nutrition, drastic changes will need to occur. These changes will involve cost-effective strategies that include reducing modifiable risk factors (related to tobacco smoke, alcohol, diet, and physical activity), coordinating mandates between health and agriculture sectors, strengthening and connecting health and food systems, improving nutrition surveillance, and expanding coverage of essential medicines, technologies, and treatments.²⁷

In 2015, former Secretary of State Madeleine Albright wrote: "In a world where one-third of all edible food never makes it to the mouths of the hungry, we all have an individual moral responsibility to do our part."²⁸ The SDGs are an important step towards taking that responsibility. To achieve them requires new ways of making goals matter.¹² First, there needs to be an accountability mechanism that holds governments' feet to the fire. In particular, the wealthiest countries should help those countries with less resources.²⁹ Currently, overseas development assistance for nutrition and NCDs is less than 1% to 2% of development assistance for health.^{30,31} Second, when countries do commit to the goals and put metrics in place, these should be scrutinized to determine if the goals are realistic and if impacts can be measured. Third, as Thomas Pogge indicated, goal-setting agendas can be perceived as political spectacles but do nothing to address root causes of why there is hunger and inequity.⁷ To fully address root causes, SDG priorities should be seen as universal and mutually reinforcing.

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Citation

AMA J Ethics. 2018;20(10):E979-986.

DOI

10.1001/amajethics.2018.979.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

POLICY FORUM

What Lies Behind the Transition From Plant-Based to Animal Protein?

Adam Drewnowski, PhD and Jean-Pierre Poulain, PhD

Abstract

Dietary changes that occur in response to economic development are collectively known as the *nutrition transition*. More specifically, diets built around staple cereals and tubers give way to diets with more animal products and more added sugars and fats. Although the proportion of dietary protein stays constant, plant proteins are replaced by animal proteins but in ways that are dependent on regional cultural, religious, and ethical concerns. The *protein transition*, viewed here as a subset of the broader nutrition transition, illustrates how dietary patterns in low- and middle-income countries (LMICs) are shaped by societal as well as by economic forces. The complexity of food decisions justifies the need to integrate nutrition with the social sciences in the study of evolving food systems.

The Nutrition and Protein Transitions

Economic development in low- and middle-income countries (LMICs) is accompanied by a *nutrition transition*.¹ Traditional diets built around staple starchy crops, such as cassava or rice, are gradually being replaced by more varied diets containing more animal products, more vegetables and fruit, and more processed foods containing added sugars and fats.^{2,3} The modernization of traditional food patterns is accompanied by longer food supply chains, changes in food retail, and more frequent eating away from home.²

Dietary intake data from LMICs undergoing nutrition transition show that the consumption of vegetable oils, animal fats, and added sugars rises sharply while the consumption of starchy staples declines.¹ In general, starchy staples are less palatable, less appealing—and often less nutritious—than the more varied dietary options that become newly available to the more affluent consumer. The nutrition transition to more varied food patterns with a higher proportion of processed foods has long been considered to be an economic phenomenon and a natural, if sometimes regrettable, consequence of economic development.¹

While dietary sugars and fats rise sharply, the proportion of protein in the diet remains virtually constant.¹ Although there is a general shift from plant to animal proteins, the choice of animal protein appears to be strongly dependent on geography, religion, and

culture. The *protein transition*, viewed here as a subset of the nutrition transition, illustrates how the drivers of food choice may not be purely economic in nature. Cases in point are the sharp regional differences within Asia in the consumption of beef and pork or of milk, yogurt, and cheese, which may not be a part of local customs or the local food culture.^{4,5} These foods' incorporation into local food patterns can engage deeper societal, cultural, and ethical concerns.

Economic Drivers of the Nutrition Transition

To what extent the adoption of "modern" diets within LMICs is a direct economic consequence of higher household incomes remains unclear. Based on studies of global dietary trends, the proportion of energy from animal fats is a direct function of gross domestic product (GDP), whereas the proportion of added sugars in the diet is linked to both GDP and urbanization.¹ The advent of inexpensive vegetable oils and added sugars has weakened past links between the consumption of fat and sugar calories and country GDP. Even low-income countries can now afford inexpensive if empty calories, mostly from added sugars and vegetable fats.^{1,3}

These shifts in dietary patterns, associated with the nutrition transition, follow two classic laws of economics. Engel's Law states that the proportion of the household budget spent on food diminishes as incomes rise.⁶ Whereas populations in high-income countries (HICs) spend a negligible amount of disposable income on food, the food budget can reach 50% or more of income in LMICs.⁷ The concept of what foods are "affordable" is thus relative, depending on absolute food prices in relation to local incomes.

The Food and Agriculture Organization of the United Nations (FAO) has recommended the use of a food price-per-calorie metric in evaluating food and agriculture policies for LMICs,⁸ and the World Bank has defined the poverty line in food and nutrition terms by estimating the cost of basic food needs, including both calories and essential nutrients.⁹ Working in India, Subramanian and Deaton¹⁰ calculated the cost of food commodities in rupees per 1 000 kcal, showing that cereals and sugar provided calories at far lower cost than did meat, dairy, or vegetables and fruit.¹¹ The same structure of food prices has been observed in HICs, including the US, France, and the United Kingdom (UK).^{12,13} A similar pattern of prices was observed in Mexico where tortillas and lard provided more calories and lower-cost calories than did vegetables and fruit.¹⁴ Not surprisingly, low-cost cereals remain the staple energy source of many global poor.¹⁵

Bennett's Law states that the proportion of the budget spent on staple grain crops diminishes as incomes rise.¹⁶ In general, grain calories are cheap, whereas most nutrient-rich foods are not. Indian consumers switched from low-cost cereal calories to more expensive calories as their living standards rose.¹¹ In other countries, likewise, the more affluent consumers do not consume more dietary energy, but their diets are more varied

and their calories cost more.¹⁵ One way to measure food affordability at the local level is to express food prices not in absolute amounts but as a percentage of disposable income for the population of interest. Comparing food prices to diet costs is another promising approach, as foods viewed as affordable by the middle class may not seem affordable to groups with lower income, especially in LMICs.¹⁵

The hidden health cost of inexpensive global diets is now coming into view. Public health agencies are increasingly concerned about the [dual burden of malnutrition](#) that is characterized by the persistence of nutrient deficiencies and stunting among children and by increased body weight among adults.³ Both forms of malnutrition can be traced to poor quality of the habitual diet, especially among the urban poor. LMICs bear the burden of the nutrition transition,¹⁷ as it has become possible to have diets more than adequate in calories but deficient in key nutrients. The key issue in planning dietary interventions for LMICs is not the provision of additional empty calories but improving the nutrient-to-energy ratio. There are different ways of achieving this aim.

Protein Quality

The current consensus in the US is that human health is best served by plant-based diets that are rich in whole grains and contain a variety of vegetables and fruits, pulses, and legumes.¹⁸ Americans are currently advised to replace red meat and meat products with more beans, legumes, lentils, fish, poultry, seafood, or lean meat.¹⁸ It is something of a paradox, then, that the current plant-based food consumption patterns of groups with lower incomes in Southeast Asia, where rice is the primary food source, tend to be deficient in calcium, iron, and zinc.¹⁹ Some of these deficiencies can be remedied by the addition of small amounts of animal foods to the diet. A 2004 report by the World Health Organization stressed the need to diversify diets built around cassava, rice, corn, wheat, or potatoes largely because of protein quality and amino acid imbalance, particularly lysine deficiency.²⁰ Dietary guidelines issued by regional governments have stressed the need to diversify largely plant-based diets by including some animal proteins. For example, dietary guidelines developed for Vietnam by the FAO stress the need to consume protein-rich foods from “a good balance of vegetable and animal sources,” including seafood as well as beans and peas.²¹ The National Institute of Nutrition has also advocated increased consumption of dairy products to remedy prevalent calcium deficiencies and promote bone growth.²²

The tradeoff between the impact of foods on [population and planetary health](#) is complex. One view, originating from meat-eating countries, is that plant-based diets are healthier for people and better for the planet.²³ Another position is that the high-nutrient density of animal foods needs to be balanced against their higher cost and greater impact on the environment.²⁴ Economic and ethical tradeoffs may need to be made. Modeling studies suggest that the environmental impact of dietary patterns in HICs can be substantially reduced without eliminating meat or dairy products altogether.²⁵ One problem, however,

is that low-cost foods with low environmental impact are not necessarily the most nutrient dense and do not necessarily provide high-quality protein.²⁴

The Cultural and Ethical Drivers of the Protein Transition

Some aspects of the nutrition transition seem to occur regardless of cultural or religious factors, food traditions, or local agricultural production patterns. These include more dietary energy from diverse sources and replacement of starchy staples (eg, cereals, roots, and tubers) with more animal products, including meat, poultry, fish, and milk and other dairy products, as well as more vegetables and fruit. These aspects of the nutrition transition seem to occur regardless of cultural or religious factors, food traditions, or local agricultural production patterns. As animal and vegetable fats and added sugars increase, however, the protein content of the diet in LMICs stays virtually constant at 12%-14% of energy.¹ The protein transition, defined by the replacement of plant proteins by (high-quality) animal proteins, is a poorly characterized component of the nutrition transition. The income-dependent shift from plant-based protein to animal protein tends to be country specific. The choice and the quality of the protein appear to be driven not only by economic factors but also by geography, religion, and culture.⁴ Depending on geographic location and local habits, plant proteins from staple grains can be replaced by meat (beef, pork, poultry), by fish, or by milk and other dairy products, including yogurt and cheese.

The Drivers of Food Choice competitive grants program, supported by the Bill and Melinda Gates Foundation and the UK government,²⁶ stresses that food choice is integral to “social and economic expression of identities, preferences, and cultural meanings and ultimately influences nutrient intake and health.”²⁷ While processed foods, added sugars, and fats in the diets of LMICs have received much research attention,³ the social and cultural drivers of the protein transition have not. Regional differences have consequences for trade and the local food supply. Some countries in Southeast Asia have shown rapid growth in the consumption of poultry and fish but not dairy; the growth in consumption of animal protein in East Asia was driven by rapidly rising pork consumption in China. By contrast, the growth in consumption of animal protein in South Asia (India) was driven by the consumption of milk and dairy foods.² These regional differences suggest that drivers of protein food choice are not purely economic but include cultural factors such as religion, shared traditions, individual attitudes, motivations, and beliefs.

Understanding the drivers of food choice requires the study of multiple biological, psychological, economic, social, cultural, and political factors. For example, in past studies,⁴ Malaysian food consumption patterns have been linked to the 3 main ethnic groups (Malay, Chinese, and Indians) and a few minority groups. Each group has its own food culture with its typical dishes and ingredients, dietary taboos and restrictions, dining rituals, form and structure of meals, and symbolic dimensions of food. Studies of

why people choose the dietary protein that they do lend themselves to a mixed-methods approach blending qualitative interviews or focus groups with quantitative surveys, which is currently missing from most observational studies in nutritional epidemiology. Social sciences can serve to describe local food habits and food cultures in different dimensions: from actual practices, to social representations and beliefs, to social norms. Focusing on what people eat and would like to eat under a variety of conditions adds a motivational or cultural component to standard nutritional or economic surveys.

Conclusion

The nutrition transition in the rapidly developing and urbanizing countries of South Asia and Southeast Asia involves a context-specific shift from plant to animal protein sources. The drivers of protein choice go beyond economics and involve ethics, religion, and culture. The inclusion of social sciences in the study of the protein transition complements existing work in nutritional epidemiology.

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Citation

AMA J Ethics. 2018;20(10):E987-993.

DOI

10.1001/amajethics.2018.987.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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ISSN 2376-6980**

MEDICINE AND SOCIETY

How to Improve Clinical Practice and Medical Education About Nutrition

David L. Katz, MD, MPH

Abstract

Diet is a universal influence on health and one of the major determinants of both years in life (longevity) and life in years (vitality). Diet is also a uniquely complex variable, encompassing nearly infinite variations in composition and concentration, making it difficult to study. Study design and the particular answers at which a given trial is aimed exert considerable influence on findings, and these, in turn, may be influenced by the biases and a priori preferences of researchers, funders, or commentators. To help patients access credible information and make informed lifestyle choices, clinicians must be able to do so themselves, yet the topic to date receives little attention in medical education. This commentary explores barriers to dietary counseling, strategies for improving medical education and clinical practice with respect to nutrition, and the ethical importance of sharing dietary information with patients.

The Importance of Nutrition and Its Absence from Medical Education

Diet is among the most universal and potent of influences on health. In modern societies where hyperprocessed foods prevail, food has undergone a truly dramatic transformation from essential sustenance into a—and perhaps the—single leading contributor to chronic disease and premature death.^{1,2} Considering the potency and ubiquity of dietary influences on health, all in “health care” are nothing less than duty bound to address this topic to the best of our ability.

Failure to address the contributions of food to health in the clinical context is an ethical lapse. That may seem startling, but it should not be. Surely it would be an ethical lapse to ignore the injurious effects of tobacco, alcohol, or illicit drugs when these are extant. Surely it would be an ethical lapse to neglect mention of relevant treatments for infection, pain, hypertension, or asthma. In just the same way, it is an ethical lapse to neglect the role of [bad dietary choices](#) in damaging health and the potential role of improved dietary choices in defending it.

Such considerations readily invite the questions: Why is diet not routinely addressed in both medical education and practice already, and what should be done about that?

Why the Failure to Address Diet in Clinical Practice?

The reason for the prevailing deficiency in medical education is a matter of history and failure to keep pace with changes in epidemiology. The basic structure of the medical school curriculum in 2018 still rests on the foundation of the Flexner Report compiled in 1920.³ At that time, diseases of nutritional deficiency still prevailed, and the modern diseases of dietary excesses were inconsequentially rare. Nutrition education was thus reasonably subsumed within biochemistry,⁴ a model that fails utterly today. Perhaps relegating the training of physicians to an educational model a century old is itself an ethical lapse? If so, we may hope the heir to Flexner is accordingly at work.

The neglect of diet in practice is not merely a matter of historical deficiencies in training, however. A full discussion of the many barriers to [dietary counseling in clinical practice](#), beyond lack of content knowledge, is beyond the scope of this discussion.⁵ We may note readily, though, that diet is differentiated from other salient influences on health in important ways, some of which impede incorporation of dietary counseling into clinical practice.

Diet is a singularly complex variable to manage or to study. The addition of any given food, ingredient, or nutrient to a diet must either displace some other or add to the total quantity consumed. Either way, the intentional movement in one dietary variable causes ineluctable movement in another if not several or even many others,⁶ hindering the confident attribution of causal effects. Such attributions are thus often made on the basis of native bias and personal preference,⁷ at times directly tethered to personal gain—such as diet book sales—and so arises yet another ethical challenge.

Then there is the universal familiarity with diet that fosters contempt not for diet, of course, but for nutritional expertise.⁸ Physicians with no genuine expertise in, say, neurosurgery are neither likely to broadcast detailed opinions on that topic nor to have their “expert” opinions solicited by media. Most topical domains in medicine enjoy such respect: we defer expert opinion and commentary to actual experts. Not so nutrition, where the common knowledge that physicians are generally ill trained in this area is conjoined to routine invitations to physicians for their expert opinions on the matter. All too many are willing to provide theirs, absent any basis for actual expertise—such as specialty training in nutrition, published research in that area, or clinical experience in dietary counseling—and this, too, is an ethical lapse. In a culture that routinely fails to distinguish expertise from mere opinion or personal anecdote, we physicians should be doing all we can to establish relevant barriers to entry for expert opinion in this, as in all other matters of genuine medical significance.

Many other factors make diet a uniquely challenging topic for the clinician. Entire industries are devoted to marketing messages that may conspire directly against well-informed medical advice in this area. A food supply willfully engineered to maximize the

calories required to feel full⁹ is directly at odds with admonishments about personal responsibility and portion control. Dietary patterns are [products of culture](#) as much as, or more than, individual preference. The choices anyone makes are always subordinate to the choices everyone has.¹⁰

Perhaps the greatest ethical imperative attached to diet is the impact it has on the environment at the scale of nearly 8 billion hungry *Homo sapiens*. Dietary patterns exert well-documented influences on aquifers, climate, and biodiversity.¹¹ As there can be no healthy patients on a planet inhospitable to human habitation, the environmental impact of diet becomes an area of ethical obligation for the clinician. If two dietary patterns are comparably likely to promote patient health but one is decisively better for the planet, this fact bears—and perhaps should require—mention. Arguably, the profound ethical implications of diet for the treatment of species other than our own also warrant inclusion among matters medical.¹²

These, then, are some among the many ethical provocations attached to nutrition in clinical practice. What are some suitable responses?

How to Address Nutritional Counseling and Challenges to Healthy Eating in Medical Education and Clinical Practice

1. Medical education must be brought up to date. For physicians to be ill trained in the very area most impactful on the rate of premature death at the population level¹³ is an absurd anachronism. All in medical education, at every level, have an ethical obligation to address this challenge. A 21st century answer to the Flexner Report would not be overreaching. In the interim, we should make optimal use of innovative models, such as culinary medicine, which are adaptable to both medical school¹⁴ and postgraduate¹⁵ settings.
2. Physicians should treat nutrition like all other content areas in medicine and leave expert opinion to those with some valid claim to expertise: research, publications, dedicated training, recognition by expert peers, and so on. By policing ourselves accordingly, we physicians may help elevate the standards of expert nutrition opinion culture wide.
3. Transparency in professional and funding relationships is essential. This is true whenever public opinion is propounded but is perhaps uniquely important for nutrition,⁷ if only because the subtleties of nutritional epidemiology can allow for questions to be posed in such a way that the answer is a foregone conclusion.¹⁶ Industry funding is an important factor here, but industry funding does not invalidate research per se; if it did, our pharmacy shelves would be empty.¹⁷ Rather, there are clear conflicts of interest in which a funder is seeking to generate evidence to obscure rather than reveal the truth, which should be

avoided, and open reporting and transparency will help reveal these. An example would be beverage industry funding of research to highlight the role of exercise in energy balance. A pattern of research on behalf of a given funder with a given agenda will also convey important information. The reporting of funding affiliations will also help identify confluences of interest, reasonably distinct from conflicts.^{18,19} There are, perhaps, more definitive solutions to the challenges in this area, but these simple steps are a start.

4. Nutrition must be addressed routinely in clinical practice. This effort can be advanced through reliance on registered dietitians and other nutrition experts as [partners in a team approach](#). New tools may support this imperative as well.²⁰
5. The importance of dietary patterns to human health and the health of the planet should figure routinely in the patient-physician dialogue. A simple example would be discussions about the relative benefits—to health, the environment, the treatment of animals, and the costs of food—of less beef, more beans. The health of people and planet cannot reasonably be unbundled.
6. The limits of nutrition research—and thus knowledge—should be understood and acknowledged by clinicians. This understanding, shared with patients and the public, should defend the fundamentals established on the basis of the weight of evidence²¹ and defend nutrition research and expertise against unjustified dogma or unsubstantiated personal opinion.
7. Finally, there is an ethical requirement for clinical humility. Where nutrition contributes most to years in life (longevity) and life in years (vitality), it does so not as a result of rarefied clinical counseling but as a byproduct of the routines of culture.²² Physicians are ethically obligated to highlight cultural transgressions—such as the aggressive marketing of junk food to adults and children alike and manipulations of food formulations to promote overconsumption—that conspire against the crucial contributions of diet to health.²³

The mission of medicine is to protect, defend, and advance the human condition. That mission cannot be fulfilled if diet is neglected. Diet has always been of fundamental importance to health; it is the fuel that runs every working element of the human machine, the one and only source of construction material for the growing body of a child. From essential sustenance, food has evolved—or devolved—into a modern scourge as well, playing a major role in the propagation of chronic disease and premature death. Diet may be the one domain where avowed “junk” is shamelessly peddled as such.

The challenges of restoring a salutary food supply, of making good choices accessible to all and empowering all people to recognize and make them, and of providing everyone

the opportunity to love food that loves them—and the planet—back reverberate culture wide. The clinical setting cannot be held accountable for an influence only culture at large can wield. But clinicians can, and should, be held to ethical account for failure to lead reliably. Culture may be the shaft, but by the nature of our professional oaths, we are at the tip of the spear.

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Citation

AMA J Ethics. 2018;20(10):E994-1000.

DOI

10.1001/amajethics.2018.994.

Conflict of Interest Disclosure

Dr Katz is the inventor of Diet Quality Photo Navigation (DQPN)[™] and the CEO of DQPN, LLC, a for-profit company, which is developing a new tool called Diet ID[™] that will help guide people to better diets for the sake of both health and environmental impact. He is also the founder and president of the True Health Initiative, a federally authorized 501c3 not-for-profit organization.

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