



Online article and related content  
current as of July 21, 2009.

## Public Health Action Amid Scientific Uncertainty: The Case of Restaurant Calorie Labeling Regulations

David S. Ludwig; Kelly D. Brownell

*JAMA*. 2009;302(4):434-435 (doi:10.1001/jama.2009.1045)

<http://jama.ama-assn.org/cgi/content/full/302/4/434>

Correction

[Contact me if this article is corrected.](#)

Citations

[Contact me when this article is cited.](#)

Topic collections

Nutritional and Metabolic Disorders; Nutrition/ Malnutrition; Public Health; Obesity;  
Diet

[Contact me when new articles are published in these topic areas.](#)

Subscribe

<http://jama.com/subscribe>

Permissions

[permissions@ama-assn.org](mailto:permissions@ama-assn.org)

<http://pubs.ama-assn.org/misc/permissions.dtl>

Email Alerts

<http://jamaarchives.com/alerts>

Reprints/E-prints

[reprints@ama-assn.org](mailto:reprints@ama-assn.org)

# Public Health Action Amid Scientific Uncertainty

## The Case of Restaurant Calorie Labeling Regulations

David S. Ludwig, MD, PhD

Kelly D. Brownell, PhD

**B**Y THE 1930S, OBSERVATIONAL STUDIES HAD SUGGESTED a link between cigarette smoking and lung cancer and, by the 1950s, strong evidence for a causal role had emerged. However, comprehensive measures to reduce cigarette smoking in the United States were delayed until after the 1964 Surgeon General's Report on Smoking and Health, in part due to the political influence of the tobacco industry.<sup>1</sup>

In 1977, the US Senate Select Committee on Health and Human Needs held hearings to explore the relationship between diet and chronic disease.<sup>2</sup> At that time, the adverse effects of saturated fat on blood cholesterol levels were well-documented, motivating the committee to recommend reducing this type of fat to 10% of calorie intake. The committee also recommended reducing total fat to 30% of calorie intake, despite concerns from scientists, such as the administrator of the US Department of Agriculture's Agricultural Research Service, that "only limited knowledge exists concerning proper diets for humans."<sup>2</sup> For the next 20 years, reduction of fat consumption became the primary dietary goal of the US government and virtually all nutrition-related professional health associations. As a result, fat consumption as a proportion of total energy decreased markedly from the 1970s to the 1990s.<sup>3</sup> During this period, the prevalence of obesity and diabetes increased greatly. Indeed, some have argued that the focus on reducing all dietary fats has actually caused harm, by diverting attention away from more effective action and by encouraging substitution of processed carbohydrates for more healthful monounsaturated and polyunsaturated fats.<sup>3</sup>

As demonstrated by these 2 accounts, the decision of whether and how to act for many public health problems must be made amid evolving and incomplete scientific knowledge. Both premature and delayed governmental action can result in preventable injury, illness, death, and economic loss on a large scale.

Today, excessive body weight threatens to overtake smoking as the leading cause of preventable death, and obesity comprises only one of many chronic diseases caused by poor diet quality. For this reason, numerous public health measures to improve diet and combat the obesity epidemic have been pro-

posed, chief among them calorie labeling. Labeling requirements now exist or are being considered in a number of states and cities, and several federal bills on the issue have been introduced. However, many of these legislative acts have encountered intense opposition from the restaurant industry, which argues that the benefits of providing this information to consumers have not been proven. In this Commentary, we propose 4 criteria to assess whether governmental action to address a public health problem is warranted and apply these criteria to calorie labeling regulation for restaurants.

### Plausibility

The first criterion is the likelihood that an intervention will succeed according to plausible biological and behavioral mechanisms. For restaurant calorie labeling regulation, a *prima facie* case can be made.

Americans consume more than a third of all calories away from home, and the nutritional quality of these foods tends to be poorer than foods eaten in the home.<sup>4</sup> Of particular concern, portion size of restaurant food, especially fast food, can be enormous. Yet most individuals have great difficulty estimating the calorie content of restaurant foods. Probably for these reasons, regular consumption of fast food is associated with excessive weight gain and increased risk for type 2 diabetes.<sup>5</sup> A substantial proportion of the US public is actively trying to lose weight, so provision of calorie information likely will positively affect consumer behavior.

Nevertheless, human behavior is complex and often unpredictable. The history of public health offers numerous examples of plausible interventions that failed or produced unintended, negative consequences when implemented. Allison,<sup>6</sup> on behalf of the restaurant industry, argues that calorie labeling regulations could paradoxically increase calorie intake and cause obesity. Although this argument is tenuous, careful consideration of potential benefits and costs of intervention is certainly warranted.

### Science

The second criterion is the strength of scientific evidence arising from well-controlled observational research and ran-

**Author Affiliations:** Department of Medicine, Children's Hospital, Boston, Massachusetts (Dr Ludwig); and Rudd Center for Food Policy and Obesity, Yale University, New Haven, Connecticut (Dr Brownell).

**Corresponding Author:** David S. Ludwig, MD, PhD, Department of Medicine, Children's Hospital, 300 Longwood Ave, Boston, MA 02115 (david.ludwig@childrens.harvard.edu).

domized controlled trials. Regarding calorie labeling, a few observational studies suggest that availability and awareness of nutritional information content may decrease calorie consumption, although these studies are cross-sectional in design and highly subject to confounding. Among the 8 experimental studies reviewed by Harnack and French<sup>7</sup> or presented elsewhere,<sup>8,9</sup> 6 studies found some degree of efficacy and 2 studies showed no effect. Each of these studies has 1 or more important limitations, including a non-naturalistic setting, lack of randomization, and use of proxy measures of food intake.

Thus, the existing data provide moderately strong, but not conclusive, evidence for a modest influence of calorie labeling on consumer behavior. However, these data may underestimate potential public health impact for several reasons. Most studies have not adequately considered body weight and dieting status. Inclusion of lean individuals unconcerned about calorie balance may dilute the apparent effect among those individuals who stand to benefit most from intervention. From a broader perspective, no single intervention is likely to have full effect in isolation because of the multifactorial nature of obesity. Educational campaigns to increase nutrition knowledge among the public, for example, may act in synergy with calorie labeling. In addition, the effect of calorie labeling may increase over time, due to the gradual nature of consumer behavior change and the possibility that market forces will motivate restaurants to reformulate menus in favor of lower calorie options.

The most important public health question is whether calorie labeling will decrease body weight among the general population. Individuals may or may not compensate for lower calorie consumption at restaurants by increasing calorie intake elsewhere. However, even if partial or total compensation were to occur, calorie labeling may have public health benefit by shifting consumption patterns away from fast food, a dietary pattern characterized by unusually large portion size and especially poor dietary quality.

### Potential Benefits vs Costs

If calorie labeling at restaurants effectively changes consumer behavior, the potential public health benefits could be enormous, in view of the medical and economic consequence of the obesity epidemic. By contrast, the direct costs of this intervention are trivial. Most restaurants subject to regulation (ie, large chain restaurants) will have already conducted calorie and nutrient analysis of standard items. Thus, the incremental costs only entail new signage.

Of much greater potential effects for some restaurants, and presumably the reason for their opposition to calorie labeling regulation, is loss of revenue, as consumers purchase fewer high-calorie, high-profit items. However, loss of revenue to any company is not necessarily a legitimate "cost" from a public health perspective. In a free market

economy, it is the government's responsibility to establish regulations that align private profit with the public interest.<sup>10</sup> For every restaurant that loses money on menu items with excessive calorie content, another stands to gain by offering more healthful portion sizes.

### Other Social Considerations

The last criterion is how an intervention relates to societal values and goals. Motorcycle helmets may be a cost-effective way to prevent head injury and the resultant economic burden on society. However, some would argue that helmet laws abridge individual freedom and, presumably for that reason, several states lack such regulation. In the case of calorie labeling, the social considerations strongly support action. If consumers have the right to know the nutrient composition of packaged foods, why would they not have the same right to the calorie content of restaurant meals?

### Conclusion

For some of the most important public health problems today, society does not have the luxury to await scientific certainty. Rather, the decision to act must be made by carefully analyzing plausibility, available scientific evidence, cost/benefit ratio, and ancillary social considerations. For restaurant calorie labeling regulation, there is clear rationale for action, despite the gaps in scientific knowledge. Ongoing efforts to examine the public health effect of this action are warranted, through high-quality experimental research now, and quasi-experimental or observational studies as laws and regulations are implemented.

**Financial Disclosures:** Dr Ludwig reported receiving royalties from a book about childhood obesity and grants from foundations and the National Institutes of Health for obesity-related research and patient care. Dr Brownell reported receiving grants from the Robert Wood Johnson Foundation and the Rudd Foundation.

### REFERENCES

1. Proctor RN. The global smoking epidemic: a history and status report. *Clin Lung Cancer*. 2004;5(6):371-376.
2. Gifford KD. Dietary fats, eating guides, and public policy: history, critique, and recommendations. *Am J Med*. 2002;113(suppl 9B):895-106S.
3. Willett WC, Leibel RL. Dietary fat is not a major determinant of body fat. *Am J Med*. 2002;113(suppl 9B):475-59S.
4. Lin B-H, Guthrie J, Frazao E. Nutrient contribution of food away from home. In: Frazao E, ed. *America's Eating Habits: Changes and Consequences*. Vol AIB No. 750. Washington, DC: US Dept of Agriculture, Economic Research Service; 1999.
5. Pereira MA, Kartashov AI, Ebbeling CB, et al. Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. *Lancet*. 2005;365(9453):36-42.
6. *New York State Rest Assoc v New York City Bd of Health*, Declaration of David B. Allison, PhD, No. 08 Civ 1000 (RJH) (SDNY 2008).
7. Harnack LJ, French SA. Effect of point-of-purchase calorie labeling on restaurant and cafeteria food choices: a review of the literature. *Int J Behav Nutr Phys Act*. 2008;5:51.
8. Gerend MA. Does calorie information promote lower calorie fast food choices among college students? *J Adolesc Health*. 2009;44(1):84-86.
9. Harnack LJ, French SA, Oakes JM, Story MT, Jeffery RW, Rydell SA. Effects of calorie labeling and value size pricing on fast food meal choices: results from an experimental trial. *Int J Behav Nutr Phys Act*. 2008;5:63.
10. Ludwig DS, Nestle M. Can the food industry play a constructive role in the obesity epidemic? *JAMA*. 2008;300(15):1808-1811.