Estimating the Potential Health Impact and Costs of Implementing a Local Policy for Food Procurement to Reduce the Consumption of Sodium in the County of Los Angeles

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Objectives. We examined approaches to reduce sodium content of food served in settings operated or funded by the government of the County of Los Angeles, California.

Methods. We adapted health impact assessment methods to mathematically simulate various levels of reduction in the sodium content of food served by the County of Los Angeles and to estimate the reductions' potential impacts on mean systolic blood pressure (SBP) among food-service customers. We used data provided by county government food-service vendors to generate these simulations.

Results. Our analysis predicted that if the postulated sodium-reduction strategies were implemented, adults would consume, on average, 233 fewer milligrams of sodium each day. This would correspond to an average decrease of 0.71 millimeters of mercury in SBP among adult hypertensives, 388 fewer cases of uncontrolled hypertension in the study population, and an annual decrease of $629 724 in direct health care costs.

Conclusions. Our findings suggest that a food-procurement policy can contribute to positive health and economic effects at the local level. Our approach may serve as an example of sodium-reduction analysis for other jurisdictions to follow. (*Am J Public Health.* 2011;101:1501–1507. doi:10.2105/AJPH.2011.300138)

In a 2010 report, the Institute of Medicine recommended that

> food retailers, governments, businesses, institutions, and other large-scale organizations that purchase or distribute food establish sodium specifications for the food they purchase and the food operations they oversee.[1]

Food-procurement policies limiting sodium content in meals purchased, distributed, or served have been enacted[2,3] or considered[4] by several jurisdictions in the United States. Excess consumption of sodium increases blood pressure and can increase the risk of cardiovascular morbidity and mortality.[5] Unfortunately, the average daily consumption of sodium in the United States—more than 3400 milligrams—greatly exceeds the limits recommended in the 2010 Dietary Guidelines for Americans: 2300 milligrams for the general population and 1500 milligrams for Blacks, adults who are middle-aged and older, and hypertensives (the latter 3 groups together account for almost 70% of the US population).[6–8] Several population models have predicted that reducing the US population's consumption of sodium on a national basis could have a substantial impact on health and health care costs.[9–12] Other studies have demonstrated that elevated blood pressure early in life may be a strong predictor of hypertension in adulthood, which suggests that interventions aimed at reducing the intake of sodium among young persons may help delay or even altogether prevent the onset of hypertension.[13,14] Although population models have examined sodium consumption at the national level, data on the potential impact and costs of implementing local policy are lacking. Findings from a previous assessment of the government of the County of Los Angeles, California, suggest that establishing a new policy for food procurement represents a potentially viable approach for reducing sodium consumption locally. In that previous assessment, a majority of the county government representatives interviewed suggested that a food-procurement policy should include department-specific ("venue-based") nutrition standards.[4] Building on that work, we adapted health impact assessment (HIA) methods to estimate (1) the potential health impacts of a local food-procurement policy on selected populations served by venues operated or funded by the County of Los Angeles and (2) the costs of implementing such a policy (e.g., staffing, training, food costs). Because the primary goal of the policy is to reduce the consumption of sodium in the population, we assessed health impact by using average systolic blood pressure (SBP) and the prevalence of uncontrolled hypertension as indicators of health improvements. We also estimated the associated reduction in direct health care costs that could be achieved.

METHODS AND RESULTS

HIA is defined

> as a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.[15]

Informed by HIA literature and methods,[15–19] we developed a mathematical simulation to estimate the potential health impacts and costs of the County of Los Angeles government implementing a food-procurement policy to reduce sodium consumption. HIAs consider the best available empirical evidence as well as the opinions, experience, and expectations of those who will be affected by the proposed policy, so that decision-makers understand the policy's potential impact.[15] In line with this approach, our simulation was informed by a series of interviews with individuals

who would be tasked with implementing such a policy.[4]

We performed 5 key steps in conducting this analysis:

1. screening, to determine which proposed policy would be assessed;
2. scoping, to define which causal pathways of the policy would be assessed, the populations that would be affected, and the methods by which the assessment would be conducted;
3. analyzing the policy's potential impact on health;
4. sensitivity analyses; and
5. cost projections.

Figure A shows our methodological approach (available as a supplement to the online version of this article at http://www.ajph.org).

Step 1: Screening

On the basis of a literature review of strategies for modifying the food environment,[20–22] we selected 2 procurement policy approaches to examine reducing the sodium content in all foods (approach 1) or labeling, promoting, subsidizing, and providing low-sodium food options (approach 2). The 4 components of approach 2 were based on published evidence and on the experience of programs that have influenced food selection.[4,21,22] To simplify our calculations, we assumed that each food-service setting would implement only 1 of the 2 approaches.

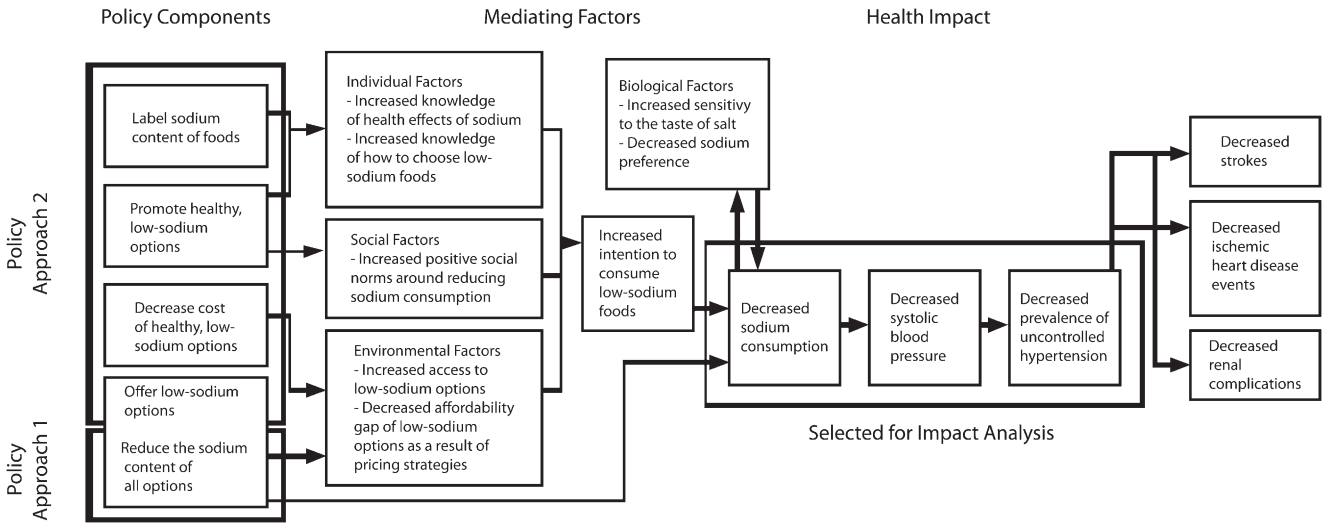
Step 2: Scoping

Scoping involves defining the causal pathways to be assessed. Figure 1 illustrates the expected causal pathways of the 2 approaches, applying a socioecological perspective.[17,21] We used cardiovascular data from the literature to construct sequential steps in the causal pathways to show how sodium reduction would lead to increased blood pressure control and disease avoidance.[9,13,23–25] Our theory of change was that a food-procurement policy to limit sodium levels in food options would reduce SBP and the prevalence of uncontrolled hypertension.

The County of Los Angeles government directly operates or contracts with vendors to operate numerous types of food services, such as worksite cafeterias, food served to residents of probation camps, and snack shops at beaches and golf courses. Collectively, these venues serve more than 46.5 million meals per year.[4] Because the reduction of blood pressure by reducing dietary sodium likely requires weeks to achieve rather than days,[26] for this assessment we only included settings that served meals to the same venue-based population at least once per day at least 5 days per week for 8 or more consecutive weeks. We chose 6 settings (Table 1) and asked representatives from each of these settings to identify which approach would be more feasible in their food environment. Representatives from 4 settings chose approach 1; representatives from the other 2 chose approach 2 (Table 1).

Step 3: Health Impact Analysis

Methodological approach. Our overall approach was to estimate the effects of reducing sodium consumption on mean SBP levels and the prevalence of uncontrolled hypertension (Figure 1). As shown in Figure 2, we developed 3 equations: the reduction in average daily sodium consumption (equation 1a), the reduction in SBP (equation 1b), and the number of individuals potentially affected (equation 2).



Note. Although these 2 policy approaches are not mutually exclusive, we assumed that each food-service setting would implement only the more feasible approach (and not both approaches). Approach 1 assumed that the food-service setting would reduce the sodium content in all foods served. Approach 2 assumed that the food-service setting would label, promote, subsidize, and provide low-sodium food options.

FIGURE 1—Logic framework for estimating the impacts on health of a proposed food-procurement policy to reduce sodium consumption among customers of food-service venues operated or funded by the County of Los Angeles, California, 2010.

TABLE 1—Assumptions Used to Estimate Potential Impacts of a Proposed Food-Procurement Policy to Reduce Sodium Consumption at 6 Food-Service Settings Operated or Funded by the County of Los Angeles, California, 2010

Setting	No. (per day) of Children or Adult Clients Served	Types of Meals Served	Levels of Sodium Reduction per Meal	Scope of Effect
Approach 1: reduce sodium content in all foods served				
Child care	24 000 children	Breakfast, lunch, snack	30% reduction from baseline	100%
Senior meals	9200 adults (≥60 y)	Lunch		
Cafeteria (buffet)	2000 adults	Lunch		
Mobile trucks[a]	1500 adults	Lunch		
Approach 2: label, promote, subsidize, and provide low-sodium food options				
Hospital cafeterias	593 adults	Breakfast, lunch	Offer alternative low-sodium meal options (i.e., baseline level of sodium in regular meals minus 600 mg)	Increase percentage of low-sodium food sales from 20% to 40%
County government cafeterias[b]	1820 adults	Lunch		Increase percentage of low-sodium food sales from 10% to 30%

[a]In 2009, the County of Los Angeles government held at least 1 contract with a mobile food truck company that operated at 15 to 20 locations throughout the week.
[b]There are several cafeterias that are contracted to vendors or are operated by the County of Los Angeles in its various facilities.

Reduction in average daily sodium consumption (Figure 2, equation 1a). Three of the 6 settings (child care, senior meals, and hospital cafeterias) have routinely performed nutritional analyses of their meals. We used sodium content obtained from these analyses (averaged over 2-6 weeks) as the baseline sodium content of the meals in these settings (range=1017-1096 mg). The 2005–2006 data from the National Health and Nutrition Examination Survey (NHANES) showed that adults in the United States consumed 30% of their daily sodium intake during lunch (1031 mg).[6] Because representatives from the other 3 settings did not have nutritional analyses of their meals, we assumed the sodium content of their meals to be 1031 milligrams.

Using these values, we estimated the level (in mg) of sodium reduction per meal that could be achieved in each setting. For approach 1, we met with the county government food-service representatives who had chosen that approach, and we presented levels of sodium reduction achieved in 4 studies reported in the literature for their consideration[27–30] (Table A, available as a supplement to the online version of this article at http://www.ajph.org). Based on this evidence, the county government food-service representatives estimated that a 30% reduction in sodium content per meal would be plausible (Table 1). For approach 2, the vendors who had chosen that approach reported that their currently available low-sodium meal options contained 600 milligrams of sodium. Thus, we calculated the level of sodium reduction per meal by subtracting 600 milligrams from the average baseline sodium content of regular meals (Table 1). We assumed that food-service customers would not compensate for the sodium reduction in low-sodium foods by adding table salt to them.[31]

County government food-service representatives estimated the average number of meals that customers ate per year in their establishment. We used this value, along with the level of sodium reduction per meal, to calculate the reduction in average daily consumption of sodium for customers in each of the settings.

Reduction in SBP (Figure 2, equation 1b). We used results of equation 1a (the reduction in average daily sodium consumption) for each food-service setting to calculate the potential reductions in SBP among customers in that setting. For adults, we used linear interpolation of data from a meta-analysis of 31 long-running trials (≥4 weeks) to calculate estimates for the dose-response relationship between reduction in sodium intake and reduced SBP. In that meta-analysis, a 2300-milligram reduction in sodium per day was associated with a 3.6 millimeters of mercury decrease in SBP among normotensives and a 7.2 millimeters of mercury decrease in SBP among hypertensives.[23] We estimated the average reduction in SBP for each setting separately and weighted the reduction for hypertensive and normotensive groups. For example, to calculate the average SBP reduction for the "mobile trucks" setting (average daily reduction of 220 mg sodium), we input the reduction into the conversion for normotensives [3.6 mm Hg × (220 mg/2300 mg)] and hypertensives [7.2 mm Hg × (220 mg/2300 mg)] and then calculated the weighted average, thus: [(normotensive SBP reduction × number of normotensives in setting) + (hypertensive SBP reduction × number of hypertensives in setting)]/total number of customers in the setting.

We assumed that the prevalence of hypertension (blood pressure≥140/90 mm Hg) for adults in all settings, with the exception of the "senior meals" setting, mirrored that of the general Los Angeles County population (31%).[32] For the "senior meals" setting, we assumed that the prevalence of hypertension

Equation 1a: Reduction in Average Daily Sodium Consumption

Level of sodium reduction (in mg) per meal	X	Average number of meals eaten per year in venue	/	365 days	=	__ mg reduction in average daily sodium consumption among customers

Equation 1b: Reduction in Systolic Blood Pressure

Average daily reduction in sodium consumption (results of equation 1a)	X	Conversion factor	=	__ mm Hg reduction in systolic blood pressure

Equation 2: Number of Individuals Potentially Affected

Number of individuals in setting	X	Percentage of individuals who reduce sodium consumption (scope of effect)	=	__ number of individuals potentially affected

Note. The conversion factor was derived from 2 studies by He and MacGregor.[23,24] We used different conversion factors for adults with and without hypertension and for children.

FIGURE 2—Equations for estimating reduction in average daily sodium consumption, reduction in systolic blood pressure, and number of individuals potentially affected by a proposed food-procurement policy to reduce sodium consumption among customers of food-service venues operated or funded by the County of Los Angeles, California, 2010.

mirrored that of adults aged 60 years and older in Los Angeles County (71%), on the basis of regional blood pressure measurements data from NHANES (1999–2004).[32]

For children in the "child care" setting, because we could not locate a meta-analysis with an exact age match (ages 0–5 years), we calculated the estimated average reduction in SBP twice, using linear interpolation of data from 2 meta-analyses: 10 trials among children and adolescents (8–16 years) and 3 trials among infants (8 weeks to 6 months). Respectively, these studies reported a decrease of 1.17 millimeters of mercury in SBP with a 42% reduction in daily sodium intake, and a decrease of 2.47 millimeters of mercury with a 54% reduction in daily sodium intake.[24] Although diagnostic criteria for hypertension do exist for children,[33] prevalence data (either by self-report or by clinical measurement) were largely unavailable for this age group (0–18 years) in Los Angeles County; thus, we conservatively assumed that all of the children in the "child care" setting were normotensive.

The number of individuals potentially affected (Figure 2, equation 2). Representatives from county government food services provided an estimate of their average daily number of customers. In settings whose representatives chose approach 1, because the sodium content of all meals would be reduced, we assumed that the intervention would affect 100% of the customers (Table 1). In settings whose representatives chose approach 2, the number of individuals who would be affected depended on the change in purchase rate of the low-sodium meal options. Food vendors estimated the baseline purchase rate of low-sodium options as 10% for county government cafeterias and 20% for hospital cafeterias. The literature lacked empirical data on intervention effects specific to the combination of interventional strategies to be included in approach 2. After examining data from 2 studies[34,35](Table A, available as a supplement to the online version of this article at http://www.ajph.org), we chose to simulate the high end of intervention effects, a 20-percentage-point increase in the purchase of low-sodium meals (Table 1).

Prevalence of uncontrolled hypertension and associated annual reduction in direct health care costs. To help policymakers better understand the health and economic significance of reducing individuals' SBP, we estimated the concomitant decrease in prevalence of uncontrolled hypertension and the associated reduction in annual health care costs. We used blood pressure data from the 1999–2004 NHANES[32] to project the percentage of adults (≥20 years) whose elevated SBP would decrease to less than 140 millimeters of mercury on the basis of the conversion factor.[9] We then applied this percentage to the number of hypertensive adults in the study population to estimate the comparable cases of uncontrolled hypertension that would be brought under control in the study group.

To calculate the associated annual reduction in direct health care costs, we multiplied the number of adult hypertension cases projected to be brought under control in the study group by the average annual cost per case of hypertension. We derived the estimated average annual cost per case of hypertension ($1623 per capita in 2009 dollars) using data from a study of health care expenditures on chronic conditions, including hypertension, in the United States.[36] Because hypertension is both a condition in itself and a major risk factor for cardiovascular disease, this figure included the direct medical costs of treating hypertension as well the attributable portion of the direct medical costs of cardiovascular disease.[36]

Simulation results. Our calculations estimated (Table 2) that if the County of Los Angeles implemented a sodium-reduction food-procurement policy, average daily consumption of sodium for customers eating in the 6 settings could be reduced by 220 milligrams (a 6% reduction in daily sodium consumption) to 773 milligrams (a 23% reduction). The proposed policy could potentially affect 13183 adults and 24000 children. On average, the simulation predicted that adults would consume 233 fewer milligrams of sodium each day (a reduction of 7%). Similarly, the simulation predicted that children in the "child care" setting would consume 304 fewer milligrams of sodium each day (a reduction of 13%). Predicted reductions in weighted average SBP for adult customers eating in 5 of the 6 settings (all but child care) ranged from 0.45 to 1.59 millimeters of mercury. Predicted reductions in SBP for children in the "child care" setting ranged

TABLE 2—Base Case Analyses Showing Potential Impacts of a Proposed Food-Procurement Policy to Reduce Sodium Consumption at 6 Food-Service Settings Operated or Funded by the County of Los Angeles, California, 2010

Settings	Reduction in Average Daily Sodium Consumption, mg (%)	Reduction in SBP (mm Hg)		
		Normotensives	Hypertensives	Overall Weighted Average
Approach 1[a]				
Child care	304 (13)	0.37–0.61	NA	0.37–0.61
Senior meals	220 (6)	0.34	0.69	0.59
Cafeteria (buffet)	255 (7)	0.40	0.80	0.52
Mobile trucks	220 (6)	0.34	0.69	0.45
Approach 2[b]				
Hospital cafeterias	773 (23)	1.21	2.42	1.59
County government cafeterias	307 (11)	0.48	0.96	0.63
Weighted averages across all adult settings	233 (7)	0.38	0.71	0.58

Note. SBP = systolic blood pressure.
[a]Approach 1 assumed that the food-service setting would reduce the sodium content in all foods served.
[b]Approach 2 assumed that the food-service setting would label, promote, subsidize, and provide low-sodium food options.

from 0.37 to 0.61 millimeters of mercury (Table 2).

Because NHANES blood pressure data are reported in whole numbers, we could not accurately estimate the reduction in the prevalence of uncontrolled hypertension for a decrease of 0.71 millimeters of mercury in SBP among adult hypertensives (n=7767). Therefore, we generated estimates assuming a reduction of 1 millimeter of mercury. Based on that level of reduction, we would expect a 5% decrease in the prevalence of uncontrolled hypertension, or 388 fewer cases of uncontrolled hypertension in the study population. We estimated that direct health care costs could decrease by $629 724 per year as a result of this reduction in SBP.

Step 4: Sensitivity Analysis

To test the results' sensitivity to different assumptions, we calculated 3 alternative scenarios. The first scenario repeated the analysis using the lower and upper bounds of the 95% confidence interval of the dose-response relationship reported in the meta-analyses that were used in the base case.[23,24] In the second scenario, because of the lack of empirical data in the literature on the effects of the interventions to be used with the 2 sodium-reduction approaches, we simulated a scenario in which we manipulated the variables related to intervention effects. For settings that would implement approach 1, we used a 20% reduction in sodium content from baseline ("worst case") and a 50% reduction in sodium content from baseline ("best case"). For settings that would implement approach 2, we manipulated the change in purchase rate of low-sodium options across a range from a 10% increase from baseline purchase rate ("worst case") to a 30% increase from baseline purchase rate ("best case"). Through discussions with food-service vendors, these were the ranges we determined to be plausible. In the third scenario, we manipulated both the dose-response relationship between sodium and SBP and the intervention effects. These alternative scenarios demonstrated moderate impacts on the projected reductions in SBP (Table B, available as a supplement to the online version of this article at http://www.ajph.org).

Step 5: Estimating Costs of a Sodium-Reduction Food-Procurement Policy

We used the perspective of the County of Los Angeles government when calculating the costs of implementing the proposed policy. We defined and calculated cost categories on the basis of descriptions of interventions in the literature and data gathered from 30 agency representatives and food vendors interviewed in a prior study.[4] Cost categories included staffing, training, tracking and oversight, promotion, and food costs. Because no agency representatives could provide a dollar value for any of the categories, we made a series of estimates for each of them. The representatives did, however, report descriptive costs (e.g., "we hired two staff," "we purchased nutritional analysis software") that we converted to budget line items.

Because of the variability among descriptive costs provided by these representatives, the potential policy implementation costs were estimated twice: line items were developed from a "high-cost" perspective (e.g., hiring the maximum number of staff, implementing all trainings, purchasing all tracking software, implementing the most extensive promotion campaign described by agency representatives) as well as a "low-cost" perspective (e.g., the opposite scenario, focusing on minimum staffing, training). Each line item was assigned a dollar value using current personnel, benefits, programmatic costs, and rates for indirect costs used by the County of Los Angeles.

Most agency representatives reported that they were unable to precisely estimate the changes in the costs of purchasing food after implementation of food policies in their organizations. Descriptively, the majority of representatives reported that changes in food costs would be "negligible or minimal" if the proposed policy was adopted[4]; thus, we calculated the high estimates assuming a 5% increase in the costs of purchasing food and low estimates assuming no increase in such costs. Based on these calculations, the estimated year 1 start-up costs for the County of Los Angeles to implement a sodium-reduction food-procurement policy ranged from $227 753 to $1 723 539 (Table C, available as a supplement to the online version of this article at http://www.ajph.org). This wide range is primarily the result of differences in uncertainty regarding the potential changes in food costs (annual food purchasing costs paid by the county government in these 6 settings is about $23 million). Notably, a majority of the representatives interviewed believed that the costs of monitoring and ensuring compliance with a food-procurement policy after the initial start-up period should be quite manageable (low to modest), presumably as a potential result of institutional familiarity with the policy, more trained staff, and better contract-negotiation skills.

DISCUSSION

Our findings suggest that a food-procurement policy aimed at reducing the consumption of sodium at various food-service settings operated or funded by the County of Los Angeles government could achieve positive health and economic effects (i.e., 388 fewer cases of uncontrolled hypertension and more than half a million dollars in reduced health care costs). The estimated immediate reductions in SBP were small (on average, <1 mm Hg in the study populations), but by maintaining a lower sodium consumption level over time, the policy could be a starting point for helping to slow the trend of age-related increases in blood pressure. The analyses also suggest that these reductions could translate into increases in control of high blood pressure at the population level among adults aged 20 years and older.

Cafeterias and other food services operated by city or county governments provide only a fraction of their clients' daily food intake, thus limiting the potential impact of reducing sodium in these settings alone. However, findings from previous research suggest that even small reductions in blood pressure can positively affect the prevalence of uncontrolled high blood pressure, coronary heart disease mortality, and stroke mortality.[37] If sodium reductions in food could be achieved across Los Angeles County and through the current national effort to lower sodium in the food supply, greater reductions in uncontrolled blood pressure could be expected.

To reduce sodium consumption to the levels recommended by the 2010 Dietary Guidelines for Americans,[7] the Institute of Medicine recommends employing many strategies at multiple levels, including establishing mandatory national standards for the sodium content of foods, reducing the sodium content of processed and restaurant foods, and increasing efforts to support consumers in making behavior changes to reduce sodium intake.[1] Food-procurement policies can support these strategies by helping to increase consumers' access to low-sodium foods and providing incentives for food manufacturers to produce lower-sodium foods.[1] Widespread adoption of food-procurement policies in local jurisdictions may help to demonstrate demand for low-sodium products and thus influence the availability of such products over time.[38,39]

The estimates that we developed were intended to help decision-makers understand how they might achieve reductions in the population's consumption of sodium through local policy decisions. We found it useful to modify traditional HIA methods to estimate the potential health impacts and costs of a policy strategy, using the government of the County of Los Angeles as an illustrative case study. A strength of this approach was that in each step of the process we incorporated feedback from potential implementers of the policy. Although we used estimates of intervention effects derived from the literature, the approach allowed us to incorporate and adjust to the conditions and unique circumstances of the county government.

Our findings suggest that to obtain the maximum benefit, a food-procurement policy to reduce sodium consumption should target settings in which (1) multiple meals are served to the same customers over the course of weeks or months, (2) meals with high levels of sodium are served, or (3) populations have a high prevalence of hypertension. Overall, we estimated the costs of implementing such a policy to be relatively modest, especially if the government entity can implement the policy without significant increases in the costs of food.

In part because of a paucity of precise data, our analysis included key assumptions that may have given rise to several important limitations. First, we assumed that customers in food-service settings operated or funded by the County of Los Angeles represented a relatively stable group (i.e., that there was little day-to-day difference in the customers). If the customer base varied considerably on a daily basis (fewer repeat customers), then we likely overestimated the proposed policy's impact. Second, no data were available on sodium consumption specific to Los Angeles County, and the national averages we used may not be representative of the populations that buy food from or eat at county-government venues. Third, we assumed that the prevalence of hypertension among customers in the study mirrored that of the general Los Angeles County population; it does not account for gender and racial/ethnic group differences. Fourth, we assumed that the relationship between sodium consumption and SBP is linear at all levels of sodium reduction.[23,24] If the dose-response relationship between sodium reduction and SBP is different or varies along the spectrum of sodium reduction levels, then we may have either underestimated or overestimated the proposed policy's effects depending on the actual conditions. Fifth, because we do not know the actual percentage of the hypertensive population currently under treatment in the county or the severity of their disease, projections of associated health care costs may be overestimated or underestimated. Finally, no quantitative data for changes in food costs and other operational costs were available, thus creating a wide range of potential costs for policy implementation. Collectively, these limitations point to the need for further research to document (1) the total sodium content of meals and snacks served by government agencies; (2) daily nutrient intake, including consumption of sodium, among different clienteles, age groups, and racial/ethnic subpopulations; and (3) changes in the rates and outcomes of cardiovascular disease as well as the costs incurred and saved after the implementation of local strategies to reduce the population's consumption of sodium.

We presented our findings to decision-makers in the Los Angeles County Department of Public Health, who indicated that the findings provided useful support for their decision to further explore the option of adopting food-procurement policies that include sodium limits. A strength of our approach is the inclusion of specific food-service settings and the incorporation of local data, local conditions, and agency preferences in our simulations of potential policy effects. This approach may serve as an example of sodium-reduction analysis for other local jurisdictions to follow. Interested investigators can build upon these methods to analyze policy costs and health impacts in their own regions. ■

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Contributors

L.N. Gase and T. Kuo conceptualized the initial design of the study and model. D. Dunet and S.M. Schmidt assisted with the development of the analytic approach. P.A. Simon and J.E. Fielding contributed to the logic framework of the study. L.N. Gase led the analyses and writing of the article. All other authors contributed to the interpretation of the analyses and the writing of the article.

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