Consumer Knowledge, Attitudes, and Behaviors of Sodium Intake and Reduction Strategies in Los Angeles County: Results of an Internet Panel Survey (2014-2015)

Ranjana N. Wickramasekaran[1], Lauren N. Gase[1], Gabrielle Green[1], Michelle Wood[1], and Tony Kuo[1,2,3]

[1]*Los Angeles County Department of Public Health, Division of Chronic Disease and Injury Prevention*
[2]*UCLA Fielding School of Public Health, Department of Epidemiology*
[3]*UCLA David Geffen School of Medicine, Department of Family Medicine*

Abstract

Background and Purpose: In Los Angeles County, over 27% of the population has been diagnosed with hypertension and over 60% is considered overweight or obese. To help address the burden of hypertension and other diet-associated diseases, the Los Angeles County Department of Public Health launched its sodium reduction initiative to scale sodium reduction approaches and, ultimately, reduce sodium intake in the region. The purpose of this study was to gain a better understanding of consumer knowledge, attitudes, and behaviors related to sodium consumption and reduction to inform ongoing program efforts. **Methods:** A cross-sectional Internet panel survey was administered from December 2014 to January 2015 to a panel of Los Angeles County adult residents (n=848). **Results:** Results suggest low levels of consumer knowledge of recommended daily sodium intake limits (5.9%), high levels of support for reduction of sodium in the food supply (>70%), and moderate levels of healthy behavior change (e.g., 48.1% reported determining their food purchases based on the sodium content, 56.3% reported watching their sodium intake). **Conclusions:** These findings support the continued need to work at multiple levels (consumer, food supplier/manufacturer, retail) to reduce sodium intake in Los Angeles County.

Keywords: Sodium, Hypertension, Food Labeling, Restaurants, Nutrition Policy, Food Preferences

Introduction

According to the Centers for Disease Control and Prevention (CDC), approximately 1 in 3 adults in the United States have been diagnosed with hypertension, which increases their risk for heart disease and stroke, two of the leading causes of death for Americans (Centers for Disease Control and Prevention [CDC], 2015). Both obesity and diet, specifically high sodium intake, are significant risk factors for hypertension (CDC, 2015). The Dietary Guidelines for Americans, 2010 recommend a maximum dietary sodium intake of 2,300 milligrams (mg)/day for the general population and 1,500 mg/day for at-risk groups, such as African Americans and older adults (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). Despite its danger, the average American consumes over 3,400 mg/day which is considerably more sodium than recommended (Institute of Medicine [IOM], 2010). Recent estimates suggest that reducing sodium intake could prevent 100,000 deaths annually in the United States (IOM, 2010).

Los Angeles County (LAC), home to over 10 million residents, parallels national trends in its high rates of chronic disease; over 27% of the population has been diagnosed with hypertension and over 60% is considered overweight or obese (UCLA Center for Health Policy Research, 2014). Racial/ethnic minorities and low-income individuals are at greater risk for chronic disease. For example, 38% of

Latinos - which make up almost half of the LAC population – report having hypertension, compared to 33% of whites. These groups often have less access to nutritious foods, such as fresh fruits and vegetables, which are naturally lower in sodium content (Larson, Story, & Nelson, 2009; Lewis, et al., 2011). Adults aged 65 years and older represent another potentially important at-risk population, given the steady increase in the number of older adults in LAC and their increased risk for chronic diseases, such as hypertension (UCLA Center for Health Policy Research, 2014).

To help address the burden of hypertension and other diet-associated diseases, the LAC Department of Public Health (DPH) launched the Los Angeles County Sodium Reduction Initiative (LACSRI) in 2010 with funding from the CDC to scale sodium reduction approaches and, ultimately, reduce sodium intake in the region (Cummings, Kuo, Gase, & Mugavero, 2014). Through this ongoing initiative, DPH partners with government and private food service institutions to increase access to healthier, lower sodium foods; provides training and technical assistance to support venues in implementing menu labeling, sodium limits, smaller portions, product placement, and pricing incentives; and works with the food industry to gradually reduce sodium in the food supply. Over the past 5 years, LACSRI has made progress in reducing the sodium content in food products across multiple institutions. For example, DPH has worked with the County of Los Angeles government's contracted food service operator to implement lower sodium snacks in approximately 325 vending machines. Likewise, DPH has worked with the county's largest school district, which serves approximately 650,000 meals per day, to implement menus with significantly decreased sodium levels (Cummings, Burbage, Wood, Butler, & Kuo, 2014).

The Current Study

The success of many environmental change strategies aimed at reducing sodium consumption relies, at least to some degree, on support from consumers and their capacity to change their behaviors. However, to date, little is known about levels of consumer awareness related to sodium and support for sodium reduction strategies. What limited research has been done suggests that consumers tend to underestimate their own sodium intake, and that few have correct knowledge about recommended sodium intake limits (Newson et al., 2013). However, it is unclear to what extent such challenges are present in LAC. Additional information from consumers is needed to help inform strategy development and evaluate progress locally. The purpose of the present study was to gauge consumer knowledge, attitudes, and behaviors regarding sodium intake and reduction efforts among LAC residents to better facilitate development, implementation, and evaluation of LACSRI strategies.

Methods

Study Design

DPH, in partnership with an online survey vendor, administered the cross-sectional Sodium Internet Panel Survey from December 2014 to January 2015.

Participants

The online survey vendor partners with online panel providers that have pre-existing relationships with consumers; consumers are invited to participate in online survey research studies though a range of consumer and business-focused brands. The target sample for the present study was 800 participants with complete answers. To be included, participants had to be 18 years of age or older, live within LAC, and be willing to respond to demographic questions. To help ensure that participants' demographics reflected the LAC population, quotas for mutually exclusive subgroups were created using data from the 2012 American Community Survey and the 2011 Los Angeles County Health Survey. Each subgroup was defined based on a combination of age, gender, race, income, and Service Planning Area, as defined by zip codes.

Procedures

Participants were recruited to participate in the present survey via e-mail by the online panel providers. Survey administration methods

followed those of previous Internet panel surveys in LAC (Gase, Barragan, Robles, Leighs, & Kuo, 2015) and all materials were approved by the LAC DPH Institutional Review Board.

Measures

The survey included 58 questions divided into 5 sections: food selection and consumption, support for policy and environmental changes, knowledge and awareness about sodium and other nutrients, health status, and demographics (see Table 2 for sample questions). To the extent possible, questions were drawn from previously administered surveys, including: (1) the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health and Nutrition Examination System Survey Questionnaire (NHANES) validated national surveys (CDC, 2014a, 2014b) (9 questions); (2) community health surveys such as the Los Angeles County Health Survey (Los Angeles County Department of Public Health, 2011) and the New York City Community Health Survey (New York City Department of Health and Mental Hygiene, 2009) (5 questions); and (3) other internally developed quality improvement surveys administered in LAC (18 questions). Eleven new questions were developed specifically for this study to assess consumer perceptions and behaviors. Screening and demographic questions has been previously used and validated by the vendor. The full survey was pre-tested prior to fielding it, through a soft-launch to 100 participants. The survey took approximately 15 minutes to complete.

For analyses, responses were collapsed to ease interpretation and to ensure that cell sizes were large enough to provide stable estimates. Knowledge, attitudes, and behavior questions with five response options were collapsed into three categories (never, sometimes, always), while those with four response options (range: strongly agree to strongly disagree) were collapsed into two (agree, disagree). Demographic categories, including age and race, were created based on the distribution of responses. Age was collapsed into the following age groups: 18-24, 25-34, 35-44, 45-54, 55-64, and 65 and over. For race, participants who reported Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or other were collapsed into a general 'other' category.

Analyses

In order to generalize results to the population of LAC, statistical weights were developed by the online survey vendor based on completed responses; they were used to account for differential sampling and differential non-response. Weights were constructed to reflect the countywide distribution of age, race, gender, income, geographic location, marital status, number of people in the household, number of children in the household, and poverty level, using data from the 2012 American Community Survey and the 2011 Los Angeles County Health Survey.

Descriptive statistics were generated and are presented as frequencies and weighted percentages for all demographic, knowledge, attitudinal, and behavioral indicators. Weighted multivariable analyses – either logistic or ordinal/multinomial regression (based on the number and ordering of the outcome categories) – were conducted to compare knowledge, attitudinal, and behavioral characteristics among demographic sub-groups (age, gender, race, education level, Body Mass Index [BMI], and family income). Joint tests of significance were used to assess whether associations between each outcome and the demographic characteristics of interest (e.g., age or race categories) were statistically significant. All analyses were conducted using SAS version 9.3 (SAS Institute Inc., Cary, North Carolina).

Results

Of the 13,100 adults in the panel (who were invited to participate), 1,767 (7.4%) started the survey. Of the 1,767 who started the survey, 919 were excluded because the quota for specific subgroups had already been met or they failed to meet eligibility criteria, leaving 848 in the final sample. Sample characteristics are presented in Table 1.

Table 1.

Characteristics of the Los Angeles County Department of Public Health Sodium Internet Panel Survey Participants, 2014 (n=848)

Characteristics	***n***[a]	***%***[b]
Gender		
Male	374	48.7%
Female	474	51.3%
Race		
White/Caucasian	350	32.7%
Black/African-American	83	8.7%
Hispanic/Latino	281	39.0%
Asian	114	16.4%
Other	20	3.2%
Age (years)		
18-24	75	14.2%
25-34	180	20.1%
35-44	168	19.1%
45-54	159	18.4%
55-64	141	13.6%
65 and over	125	14.6%
Family Income		
Less than $15,000	85	10.3%
$15,000-$24,999	110	12.4%
$25,000-$49,999	171	22.6%
$50,000-$74,999	153	18.4%
$75,000-$149,999	121	10.7%
$100,000-$149,999	122	17.3%
$150,000 or more	86	8.4%
Education Level		
Did not complete high school	18	4.5%
Graduated high school	138	29.6%
Some college or technical/vocational school	191	23.1%
Associate's degree or Bachelor's degree	350	30.7%
Master's, PhD or other professional degree	147	12.1%
Body Mass Index (BMI)[c]		
Underweight	24	3.3%
Normal	318	37.0%
Overweight/Obese	500	59.8%

[a] *n*=number of participants (unweighted).
[b] Percentages are weighted to account for differential sampling, differential non-responses, and other external parameters such as marital status and education.
[c] BMI was calculated using the CDC's formula for adults: underweight, < 18.5; normal, 18.5-24.9; overweight, 25.0-29.9; obese, ≥ 30.0. Implausible weights and heights as defined by the CDC were excluded from the analysis.

Knowledge

Most participants reported that sodium was somewhat or very harmful to their health (53.6% and 24.6%, respectively). While most participants recognized that food served at fast-food restaurants has too much salt (71.4%), only 40% of participants said the same about food served in sit-down restaurants. Knowledge of recommended daily sodium limits was lacking: when asked how much sodium the average adult should consume each day, over 90% of participants either failed to give an answer or provided an answer outside the range of the daily recommended sodium limits (Table 2).

Multivariable logistic regression analysis showed some differences in knowledge among demographic subgroups. Knowledge of the harm associated with consuming salt was associated with race (χ^2=18.99, *p*-value=0.015). The odds of reporting that consuming salt was very harmful to one's health - relative to reporting that consuming salt was not harmful to one's health - was higher for Hispanics/Latinos than whites, holding all other variables constant (Adjusted Odds Ratio [AOR]=2.67, 95% Confidence Interval [CI]= [1.43-5.02]).

Race was also associated with reporting whether there was too much salt in food served at fast-food (χ^2=14.96, *p*-value=0.005) and sit-down (χ^2=19.04, *p*-value<0.001) restaurants, with Hispanics/Latinos and Asians consistently reporting lower odds than whites, after controlling for other factors. Blacks also had lower odds of reporting too much salt in food served at sit-down restaurants, compared to whites (Table 3). No differences were observed among demographic groups with regard to knowledge of recommended daily sodium limits.

Table 2.

Participant knowledge, attitudes, and behaviors related to sodium intake and reduction strategies in Los Angeles County, Sodium Internet Panel Survey, 2014 (n=848)

Question	n[a]	%[b]
Knowledge		
What impact, if any, do you think consuming salt has on your health?[c]		
Not harmful	195	21.8%
Somewhat harmful	445	53.6%
Very harmful	208	24.6%
Food served at fast-food restaurants or chains such as: McDonalds, Taco Bell, Subway, or similar has…[c]		
Too much salt	638	71.4%
Not/Just enough salt	210	28.7%
Food served at sit-down restaurants, including neighborhood restaurants, chains, and fine dining establishments (e.g. Denny's, Olive Garden, Houston's, etc.) has…[c]		
Too much salt	391	39.5%
Not/Just enough salt	457	60.5%
How many milligrams of sodium is an average adult supposed to consume each day?[d]		
Responded within correct range (1,500-2,300 mg)	52	5.9%
Responded outside of correct rage or don't know	796	94.1%
Attitudes		
There should be restrictions placed on how much sodium or salt is allowed in packaged foods[e]		
Agree	626	72.2%
Disagree	222	27.8%
There should be restrictions placed on how much sodium or salt is allowed in foods served at restaurants[e]		
Agree	596	70.6%
Disagree	252	29.4%
How important is it for food and beverage companies to change ingredients in their products in order to reduce sodium or salt content?[d]		
Not important	87	11.5%
Somewhat important	277	33.2%
Very important	484	55.2%
Behaviors		
Are you currently watching or reducing your salt intake?[f]		
Yes	468	56.3%
No	380	43.7%
How often do you use a food label or Nutrition Facts Label to help you decide what food to purchase?[c]		
Never	58	8.8%
Sometimes	384	46.7%
Always/Most of the time	406	44.5%
How often do you change your mind about buying a food product because of the sodium content?[g]		
Never	80	10.3%
Sometimes	325	41.6%
Always/Most of the time	385	48.1%
Has a doctor, nurse or other health professional ever advised you to reduce your sodium or salt intake?[f]		
Yes	281	34.3%
No	567	65.7%

[a] *n*=number of participants (unweighted).

[b] Percentages are weighted to account for differential sampling, differential non-responses, and other external parameters such as marital status and education. Percentages may not add up to 100 due to rounding.

[c] Question internally developed for the purposes of this study.

[d] Question adapted from other internally developed quality improvement surveys previously administered to Los Angeles County residents.

[e] Question adapted from the 2011 Los Angeles County Health Survey.

[f] Question adapted from the Behavioral Risk Factor Surveillance System (BRFSS).

[g] Question adapted from the National Health and Nutrition Examination Survey (NHANES).

Attitudes

Overall, attitudes toward sodium reduction strategies were positive: most participants were supportive of placing restrictions on how much sodium is allowed in packaged and restaurant food (72.2% and 70.6%, respectively). Moreover, most participants thought it was either somewhat (33.2%) or very (55.2%) important for food and beverage companies to change ingredients in their products to reduce sodium content (Table 2).

Multivariable logistic regression analysis showed some differences in attitudes among demographic subgroups. While there were no differences on attitudes toward sodium restrictions on packaged foods, attitudes toward restrictions on food served at restaurants did differ by gender (χ^2=5.76, *p*-value=0.016). After controlling for other factors, females had higher odds of supporting these restrictions, when compared to males (Table 3). Similarly, females, had higher odds of reporting that it was very important for beverage and food companies to change their product ingredients to reduce sodium content, relative to feeling these restrictions were not important, holding other variables constant (AOR=2.35, 95% CI= [1.21-4.56]).

Behaviors

Finally, participants' behaviors reflect the use of sodium reduction strategies in their daily lives. Just over half of participants (56.3%) reported watching or reducing their salt intake. Most participants reported using the Nutrition Facts Label to make food purchasing decisions sometimes or always (46.7% and 44.5%, respectively) and 89.7% reported changing their mind about purchasing certain food products due to the sodium content. Only 34.3% reported having been advised by a health professional to reduce their sodium intake (Table 2).

Multivariable logistic regression analysis showed some differences in behaviors among demographic subgroups. Both older age (χ^2=15.10, *p*-value=0.010) and higher BMI (χ^2=9.67, *p*-value=0.008) were significantly associated with having been advised by a health professional to reduce sodium intake, after controlling for other factors (Table 3). Frequency of using a Nutrition Facts Label to make purchasing decisions was associated with gender (χ^2=6.35, p-value=0.042), race (χ^2=16.76, p-value=0.033), and education (χ^2=26.05, p-value=0.001). After controlling for other factors, the odds of always using a Nutrition Facts Label (relative to never using a Nutrition Facts Label) was higher for females (relative to males, AOR= 2.680, 95% CI= [1.24-5.79]). In addition, Hispanics/Latinos had lower odds of always using such labels (relative to whites, AOR = 0.374, 95% CI = [0.15-0.96]) as did those who did not complete high school (AOR = 0.05, 95% CI = [0.01-0.26]) or who graduated high school (AOR = 0.23, 95% CI = [0.10-0.56]), relative to those who graduated with a Bachelor's or Associate's degree. No differences were observed among demographic groups with regard to how often they changed their mind about buying a food product because of its sodium content.

Table 3.

Multivariable regression analysis results of select questions in the Los Angeles County Department of Public Health Sodium Internet Panel Survey, 2014 (n=838)[a]

	Outcome Variables, Adjusted Odds Ratio (95% Confidence Interval)[b]					
	Knowledge		Attitudes		Behaviors	
Covariates	Food served at fast-food restaurants or chains has too much salt	Food served at sit-down restaurants has too much salt	There should be restrictions placed on how much sodium or salt is allowed in packaged foods	There should be restrictions placed on how much sodium or salt is allowed in foods served at restaurants	Currently watching or reducing salt intake	A doctor, nurse or other health professional has advised to reduce sodium or salt intake
Gender (Referent: Male)						
Female	1.22 (0.79-1.89)	1.19 (0.81-1.75)	1.41 (0.90-2.20)	1.69 (1.10-2.60)*	0.75 (0.51-1.09)	0.71 (0.47-1.07)
Race (Referent: White)						
Black	0.60 (0.31-1.16)	0.53 (0.30-0.95)*	1.76 (0.86-3.61)	1.78 (0.88-3.58)	2.64 (1.30-5.34)	1.85 (0.96-3.56)
Hispanic/Latino	0.45 (0.28-0.74)*	0.42 (0.28-0.64)*	1.06 (0.65-1.73)	0.88 (0.55-1.40)	1.13 (0.75-1.72)	0.80 (0.51-1.26)
Asian	0.38 (0.21-0.70)*	0.51 (0.29-0.88)*	1.06 (0.59-1.92)	1.37 (0.77-2.42)	1.19 (0.69-2.04)	1.22 (0.70-2.12)
Other	0.87 (0.23-3.29)	0.71 (0.26-1.92)	0.74 (0.24-2.24)	1.09 (0.34-3.53)	0.66 (0.23-1.91)	0.75 (0.21-2.65)
Age in years (Referent: 25-34)						
18-24	0.68 (0.32-1.44)	0.39 (0.18-0.87)	0.46 (0.22-0.96)	0.87 (0.41-1.86)	1.68 (0.84-3.38)	2.21 (0.98-4.99)
35-44	0.93 (0.51-1.70)	0.78 (0.46-1.41)	0.71 (0.39-1.32)	1.02 (0.57-1.82)	1.27 (0.76-2.14)	1.27 (0.68-2.36)
45-54	0.87 (0.46-1.65)	0.81 (0.46-1.41)	0.95 (0.50-1.83)	0.92 (0.50-1.70)	1.84 (1.07-3.18)	1.69 (0.92-3.08)
55-64	0.67 (0.36-1.27)	0.68 (0.39-1.20)	0.84 (0.44-1.58)	0.81 (0.44-1.48)	1.83 (1.04-3.21)	1.92 (1.01-3.64)*
65 and over	0.56 (0.29-1.09)	0.66 (0.37-1.18)	0.79 (0.41-1.50)	0.76 (0.41-1.43)	1.86 (1.02-3.36)	3.04 (1.64-5.64)*
Education level (Referent: Graduated with an Associates's or Bachelor's degree)						
Did not complete high school	1.36 (0.43-4.24)	1.22 (0.38-3.96)	0.45 (0.14-1.44)	0.69 (0.22-2.16)	1.64 (0.59-4.55)	0.41 (0.09-1.94)
Graduated high school	1.10 (0.64-1.87)	0.63 (0.38-1.05)	0.70 (0.41-1.22)	1.04 (0.59-1.85)	1.06 (0.65-1.72)	1.09 (0.64-1.86)
Attended some college or technical/vocational school	1.22 (0.75-1.99)	1.05 (0.67-1.64)	0.91 (0.55-1.52)	0.76 (0.48-1.22)	0.99 (0.64-1.52)	1.18 (0. 75-1.88)
Obtained a Master's, PhD or other professional degree	1.82 (1.03-3.22)	1.53 (0.95-2.47)	0.63 (0.38-1.05)	0.63 (0.39-1.03)	0.87 (0.55-1.39)	1.14 (0.70-1.87)
BMI (Referent: Normal)						
Underweight	0.73 (0.24-2.20)	0.34 (0.14-0.87)	1.19 (0.30-4.72)	0.70 (0.21-2.39)	0.57 (0.19-1.74)	0.75 (0.21-2.67)
Overweight/Obese	1.05 (0.70-1.59)	0.78 (0.54-1.12)	0.89 (0.59-1.34)	1.15 (0.77-1.72)	1.11 (0.78-1.60)	1.76 (1.20-2.59)*

[a] n reflects the number of survey participants who reported no missing data on any variables that were included in the multivariable models.
[b] Predictors for the multivariable logistic regression models included: age, gender, race, education level, BMI, and family income (not shown due to space constraints).
* Significantly different than referent group, after joint F-test results yielded p-value < 0.05

Discussion

The study demonstrates mixed levels of consumer knowledge and behaviors around sodium and high levels of support for changes to sodium content in food. Results from the present study are consistent with previous, albeit limited, studies suggesting that most consumers are aware of the potential harm of excessive sodium intake (Patel, Cogswell, John, Creel, & Ayala, 2015), but few can correctly identify and understand daily sodium intake guidelines and recommendations (Newsom et al., 2013). Similarly, high levels of consumer support for the food industry to reduce sodium content, as found in the present study, complements the results from previous U.S. surveys, which showed strong support among the general public for population-based sodium reduction strategies (Morain & Mello, 2013; Patel, Gunn, Tong, & Cogswell, 2014).

The present study adds further evidence to a growing body of research that suggests that while most consumers support reducing their sodium consumption, many do not have the knowledge and skills to make meaningful and effective changes to their sodium intake. Results of multivariable analyses are consistent with previous studies which showed that those who adopt healthy lifestyles tended to be female, older adults, and/or highly educated (Divine & Lepisto, 2005). Women in particular tended to be more conscious of their diet and were therefore more likely to use food labels (Divine & Lepisto, 2005; Ollberding, Wolf, & Contento, 2011). While it is encouraging that many survey participants reported changing their food purchases based on the sodium content listed on the Nutrition Facts Label, the lack of knowledge regarding recommended daily levels of sodium intake – reported accurately by only 6% - calls into question how well-informed these purchasing decisions were, and whether Nutrition Facts Labels are effective in reducing sodium intake (Cobb, Appel, & Anderson, 2012).

Based on these results, future health promotion efforts could benefit from educating consumers about sodium by providing them with information that is applicable to their daily food consumption habits. Given that only a third of participants reported being advised by their health care provider to reduce their sodium intake, partnering with the medical community may provide a complementary opportunity to educate patients on the link between sodium, hypertension and other chronic diseases. Currently DPH is working to promote lifestyle change programs such as the American Heart Association's blood pressure initiative, which assists and equips healthcare providers with tools (e.g., the AHA Blood Pressure Algorithm) that can be used to help empower patients to better control their blood pressure. The initiative includes recommendation(s) on how patients can modify their sodium intake, with special considerations for high-risk groups – Blacks and older adults (American Heart Association, 2013). Finally, given the strong support among participants for placing restrictions on sodium content in both packaged foods and at restaurants, environmental change strategies should be implemented to complement educational efforts and to facilitate reductions in sodium intake even for individuals who are not consciously modifying their dietary behaviors (IOM, 2010). Emerging evidence suggests that environmental change strategies such as healthy food procurement standards to increase access to lower-sodium options and changes to the food supply represent a collection of promising approaches to achieve public health goals without the need to significantly change behavior on the part of the consumers (Robles, Wood, Kimmons, & Kuo, 2013; IOM, 2010). However, data that confirm the long-term health impact of these approaches to achieve changes in sodium intake at the population level remain limited. More research and evaluation is needed in this regard.

Limitations

While this survey is one of the first to examine sodium-related attitudes and perceptions in a large urban population, it has a number of limitations. This survey is subject to selection bias since participants self-selected into the survey panel. While quota targets and weights were used to minimize this bias, subsets of the population that do not use or do not have ready

access to the Internet may be underrepresented. Because there is no information available on those who were excluded (due to quotas or failure to meet the eligibility criteria), no formal assessment can be conducted to examine how these individuals compared with those who completed the survey. In this regard, caution should be taken when interpreting these results. Additionally, because some questions were internally developed for the survey (to assess a new topic area), little or no information is available on their reliability or validity as measures. Finally, due to the cross-sectional nature of the analyses, causal relationships could not be determined. Regression analyses in the study were done for exploratory purposes. They have limited ability to explain what actually drove the identified differences observed or how the factors studied affected LACSRI strategy implementation.

Conclusions

This study provides a snapshot of opinions and self-reported behaviors that can help inform efforts to reduce sodium intake in the region. Collaboration with the food industry to develop and provide access to lower sodium products, complemented by education on daily sodium limits for consumers, may represent a strategic approach to reducing sodium intake in the population.

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Author Information
Tony Kuo, MD, MSHS
Acting Director
Division of Chronic Disease and Injury Prevention
Los Angeles County Department of Public Health
3530 Wilshire Blvd, 8th Floor
Los Angeles, CA 90010
Tel: (213) 351-7825; Fax: 213-351-2713
Email: tkuo@ph.lacounty.gov

* corresponding author