

Fundamentos económicos de las intervenciones de Salud Pública: las bebidas azucaradas

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- Mesa SESPAS. Antecedentes
 - Las bebidas azucaradas: importancia económica
 - Factor de riesgo de obesidad y otros problemas
 - Papel de la salud pública
 - Posibilidades y limitaciones de la fiscalidad
-



Las Bebidas Refrescantes y su Impacto Socioeconómico en España

Cátedra GLAP, IESE

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Cátedra
José Felipe Bertrán
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Liderazgo en la
Administración Pública

Este informe utiliza los datos más actualizados con los que es posible contar de forma fidedigna. Esto quiere decir que en muchos casos nuestros datos consolidados llegan hasta el año 2011, ya que todavía no es posible contar con la información para el año 2012 con un nivel de detalle suficiente.

Descripción del Producto

Las bebidas refrescantes son bebidas sin alcohol compuestas fundamentalmente por agua. A este ingrediente básico se le añaden otros como zumos, aromas, azúcar, etc. para darle sabor. Se consiguen así distintas categorías de productos: con o sin gas, con o sin azúcar, bebidas para deportistas... y de distintos sabores como cola, naranja, limón, gaseosa, bebidas de té, etc.

Legalmente, las "bebidas refrescantes" responden a una categorización que engloba una serie de bebidas sin alcohol, dentro de la cual existe una gran variedad de productos. Siguiendo la legislación española, existen diez tipos distintos de bebidas refrescantes: Aguas carbonatadas, aguas aromatizadas, gaseosas, bebidas refrescantes aromatizadas, bebidas refrescantes de extractos, bebidas refrescantes de zumos de frutas, bebidas refrescantes de disgregados de frutas, bebidas refrescantes mixtas, bebidas refrescantes para diluir y productos sólidos de preparación de bebidas refrescantes. El sector fabricante de bebidas refrescantes es capaz, por tanto, de satisfacer las preferencias de todo tipo de consumidores.

Las bebidas refrescantes contienen en su mayor parte agua. La adición de carbohidratos se recomienda con el objeto de preservar por más tiempo las reservas de glicógeno corporal, especialmente tras realizar actividades deportivas. De hecho, para mejorar su balance de fluidos, los deportistas recurren habitualmente a las bebidas carbohidratadas.³

El sector en cifras

Facturación Total: = 12.139 millones de euros
Facturación Directa = 4.993 millones de euros
Facturación Indirecta = 7.146 millones de euros

Hogares que consumen bebidas refrescantes: 12.857.000
Establecimientos que venden BB.RR (HORECA): 239.191
Establecimientos de alimentación que venden BB.RR: 19.454
Número total de consumidores: 36.870.000

Empleo Total: = 63.609 puestos de trabajo
Empleo Directo = 8.417 puestos de trabajo
Empleo Indirecto = 55.191 puestos de trabajo
*Empleo inducido** = 313.295 puestos de trabajo

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Antigüedad media trabajadores: 14 años
Crecimiento 80% horas dedicadas a formación (2007 – 2011)

Lanzamiento de nuevos productos: 148 en 2011
Inversión sectorial: 93 – 208 millones de euros
Inversión sectorial: 9.1% – 20.2% valor añadido total
Inversión economía española: 1.4% PIB

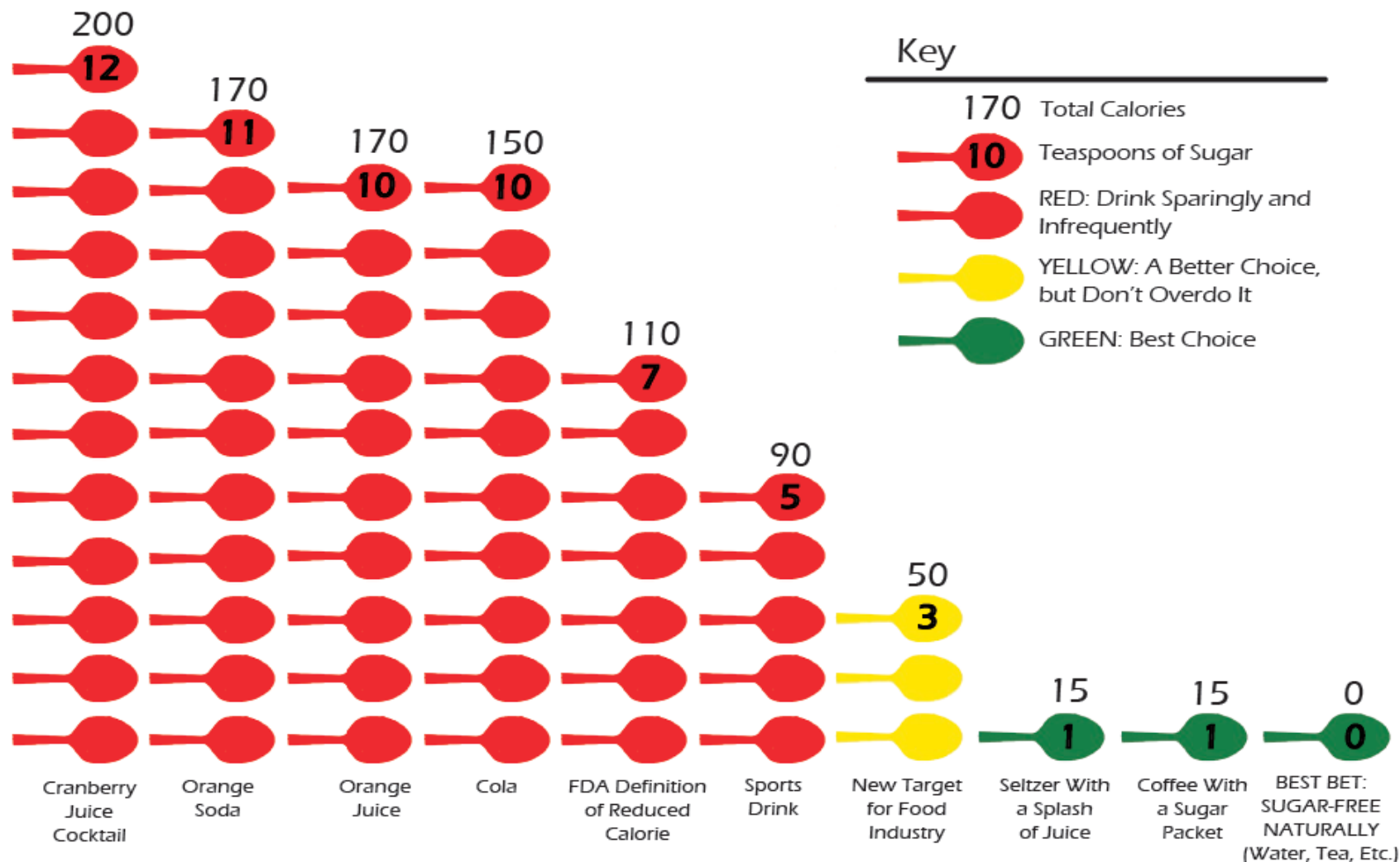
Contribución al Sector Público = 542 millones de euros
Pagos por IVA = 371 millones de euros
Cotizaciones Seguridad Social = 386 millones de euros

* Empleo inducido: Trabajadores empleados en establecimientos centrados únicamente en la venta de bebidas.
Para más detalles, véase la sección 3.1 de este informe.

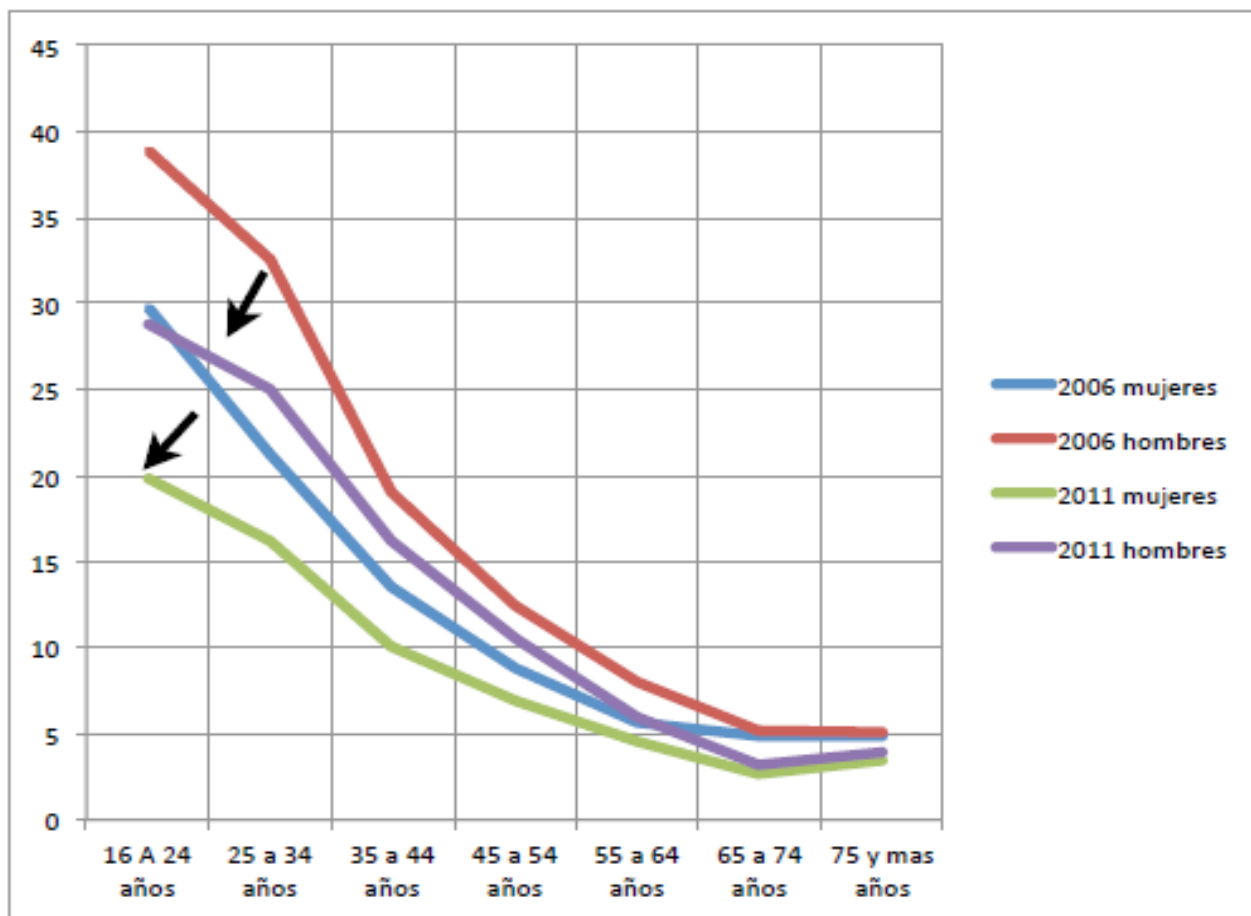
How Sweet Is It?

Calories and Teaspoons of Sugar in 12 Ounces of Each Beverage

For more information, see The Nutrition Source, www.hsph.harvard.edu/nutritionsource/healthy-drinks/



% de personas que toma refrescos azucarados diariamente



Fuente: ENSE 2006 y 2011

Tabla 1. CONSUMO BEBIDAS DULCES Y REFRESCOS

Datos de la Encuesta Nacional de Salud-2011. Muestra de menores.
<http://www.msc.es/estadEstudios/estadisticas/encuestaNacional/encuesta2011.htm>

	A diario (%)	Más de tres veces/sem pero no a diario (%)	Porcentaje de niños más expuestos a bebidas dulces
Edad 1-4 años, varones	4,01	4,77	
Edad 1-4 años, mujeres	4,24	2,66	
Edad 1-4 años, TOTAL	4,12	3,78	7,90
Edad 5-14 años, varones	11,41	11,29	
Edad 5-14 años, mujeres	10,69	8,28	
Edad 5-14 años, TOTAL	11,6	9,83	21,43
Clase social I, varones	8,99	10,03	
Clase social I, mujeres	5,64	7,21	
Clase social I, TOTAL	7,38	8,67	16,05
Clase social VI, varones	19,24	11,54	
Clase social VI, mujeres	12,80	7,85	
Clase social VI, TOTAL	15,65	9,49	25,14

% que consume **refrescos** con azúcar diariamente

Según situación laboral

	% fruta diaria	Pre- crisis 2006	Crisis 2011/12	OR 2006	OR 2011
H	Ocupados	24.2	14.9	0.85	0.74
	Parados	27.2	19		
M	Ocupadas	17.9	9	0.78	0.57
	Paradas	21.9	14.8		



CONSUMO DE ALIMENTACIÓN FUERA DEL HOGAR POR PRODUCTOS: BEBIDAS

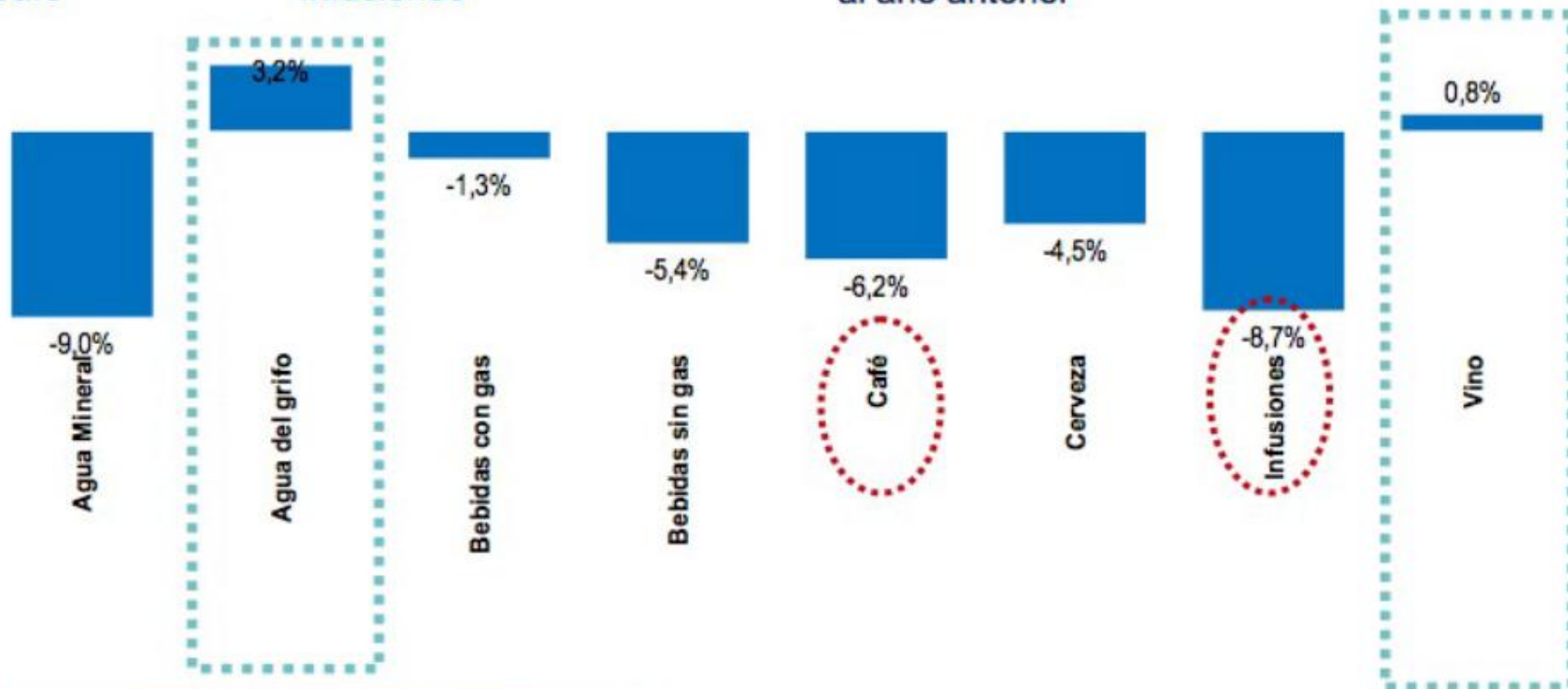
VARIACIÓN CONSUMICIONES (%)

Disminuye Consumiciones (>5%)

Agua mineral
Café

Bebidas sin gas
Infusiones

Vino y agua de grifo incrementan ligeramente en consumiciones respecto al año anterior



Evolución Porciones (%) 2012 vs. 2011



GOBIERNO DE ESPAÑA

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

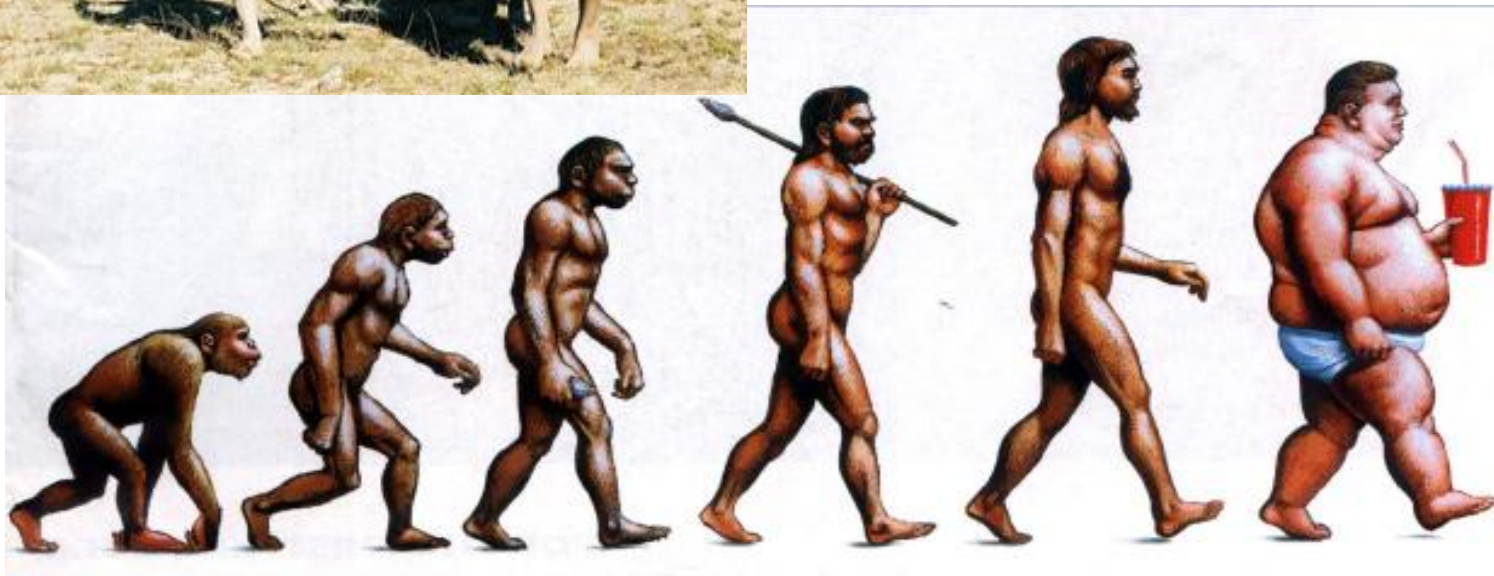
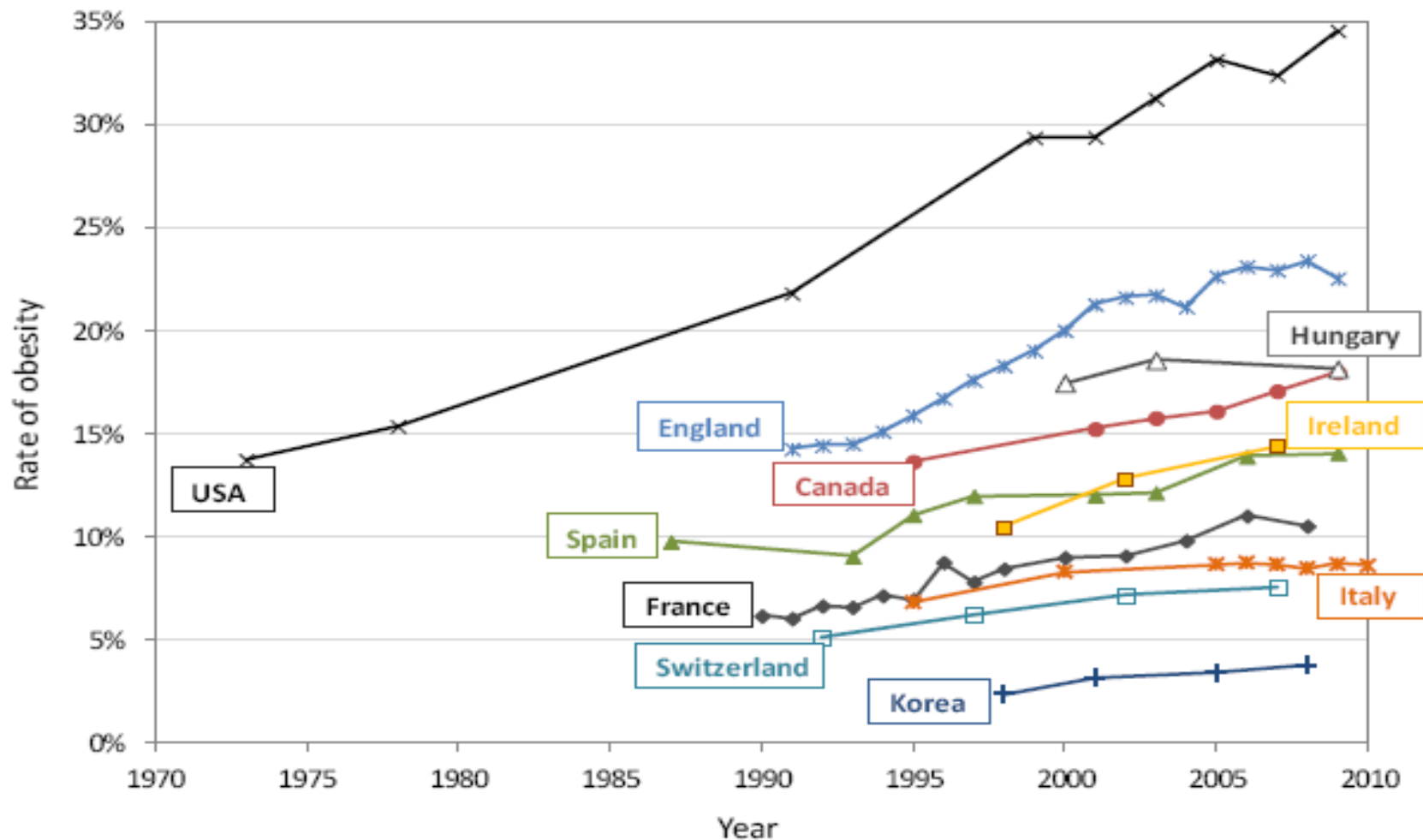
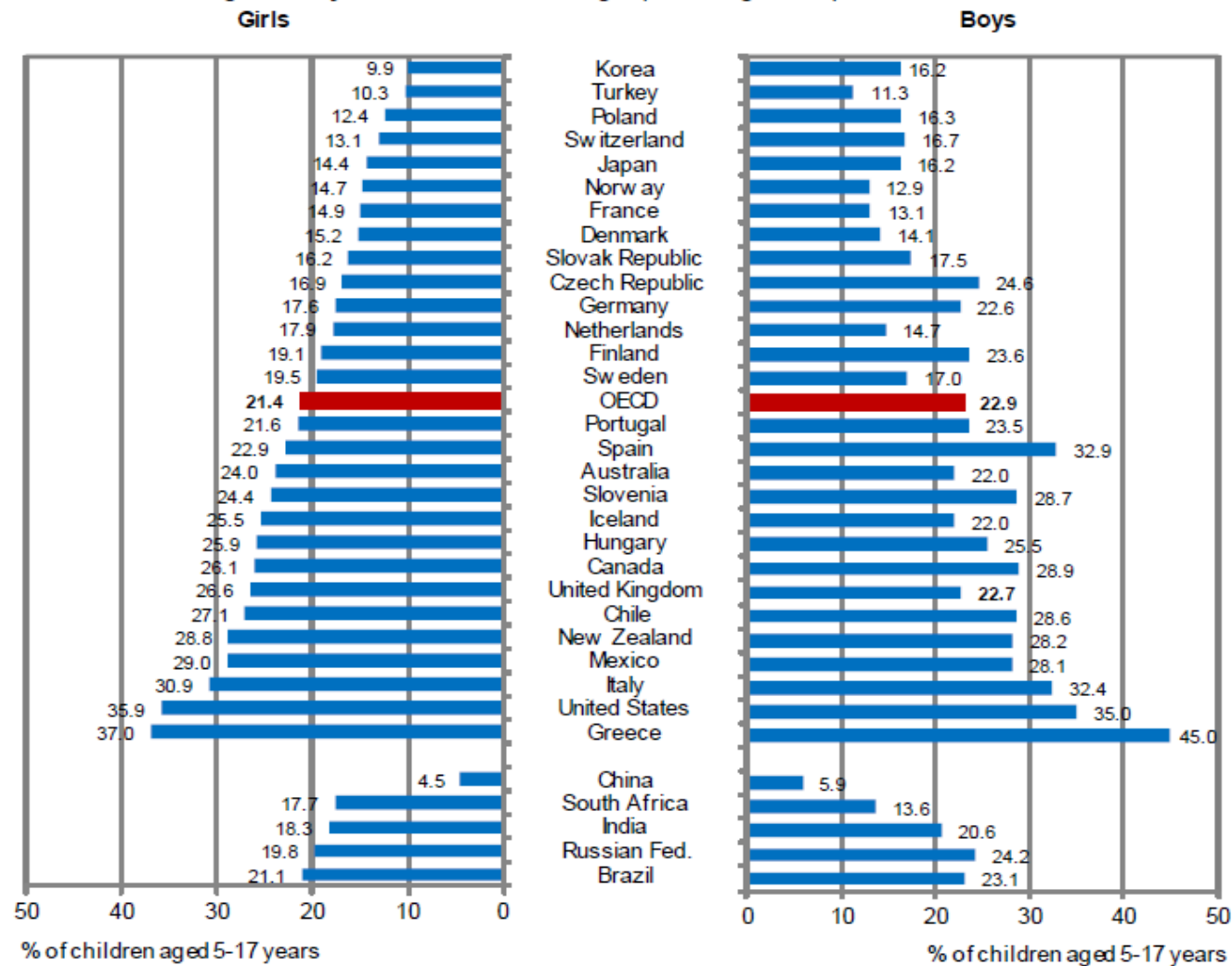


Figure 1. Obesity rates

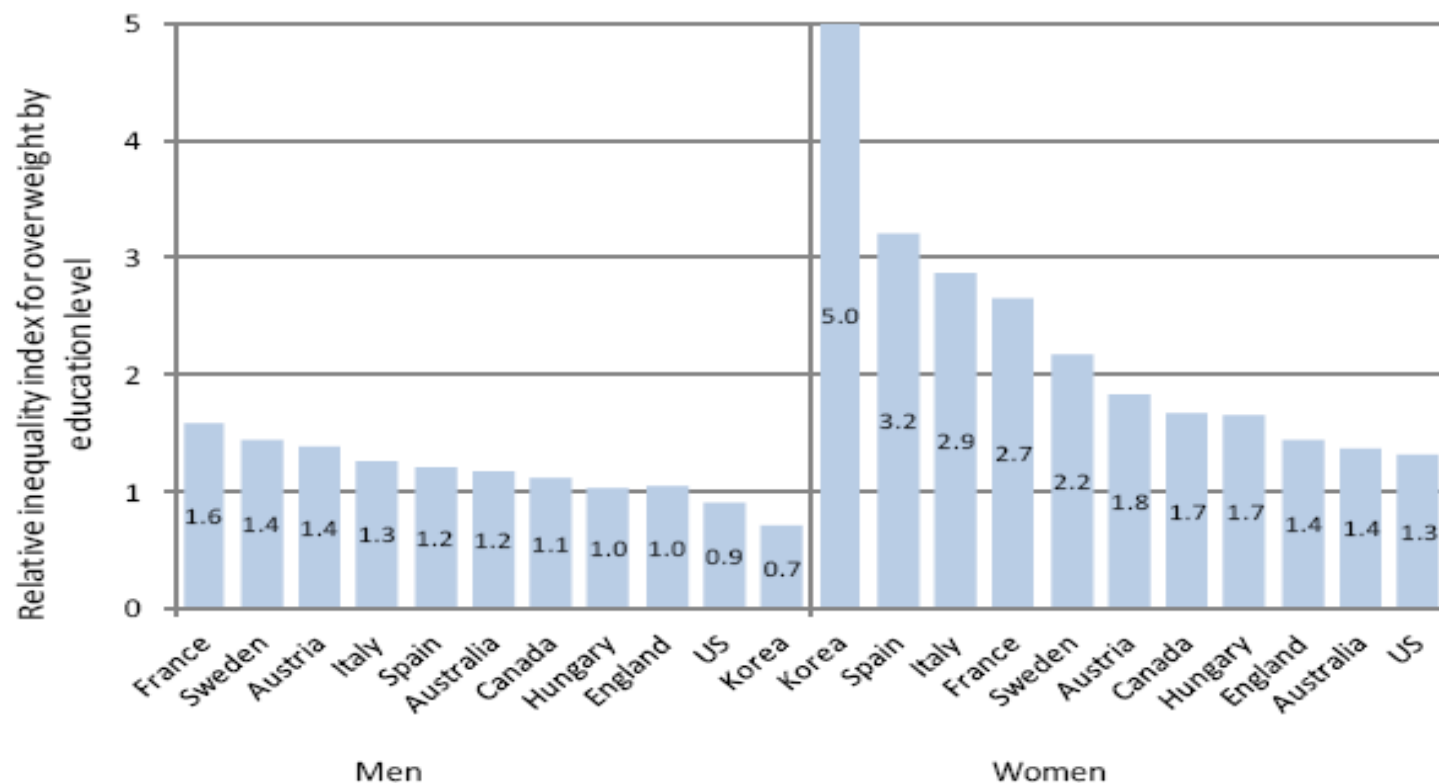


Children aged 5-17 years who are overweight (including obese), latest available estimates



Source: International Association for the Study of Obesity (2011).

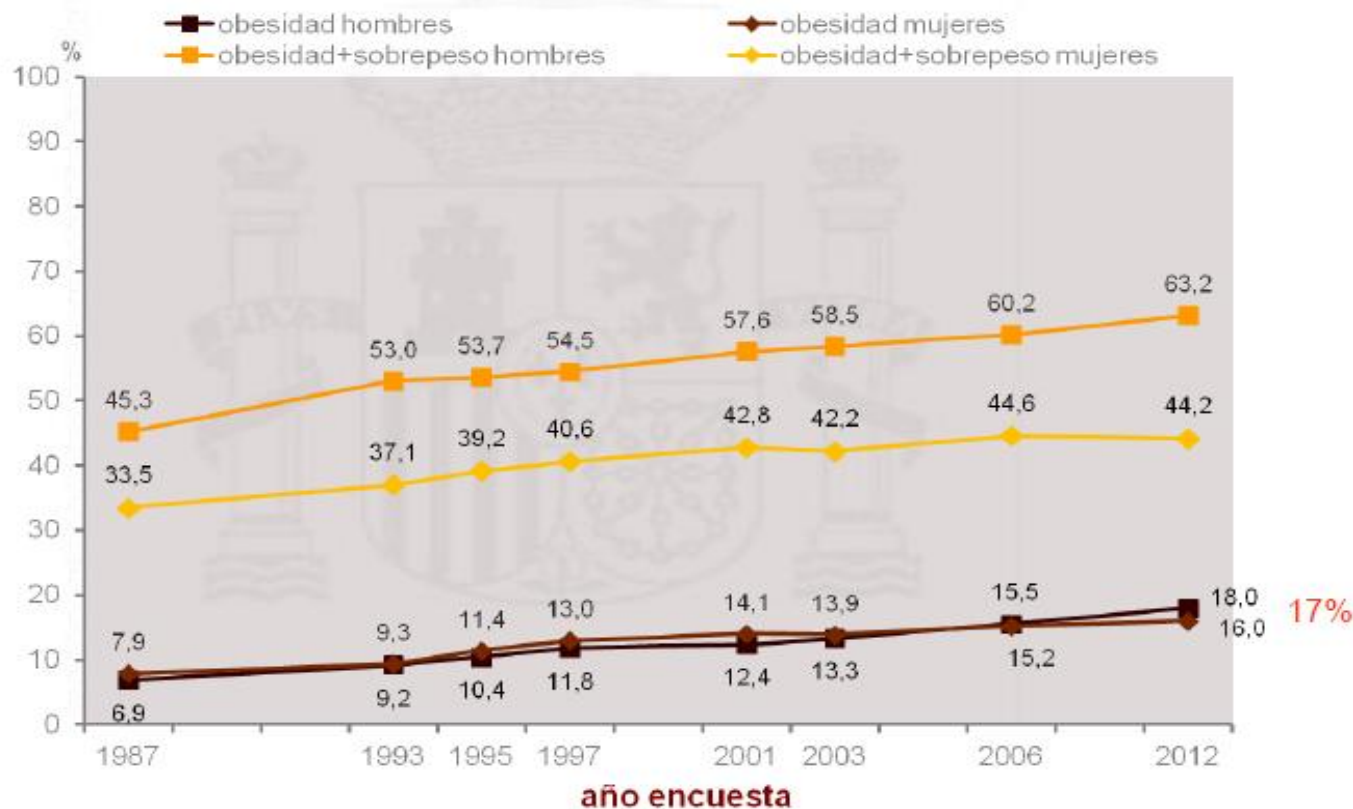
Figure 4. Inequality index, overweight by education



Note: The index shows how many times as likely to be overweight is someone at the lowest end of the education spectrum in one country, compared to someone at the highest end.



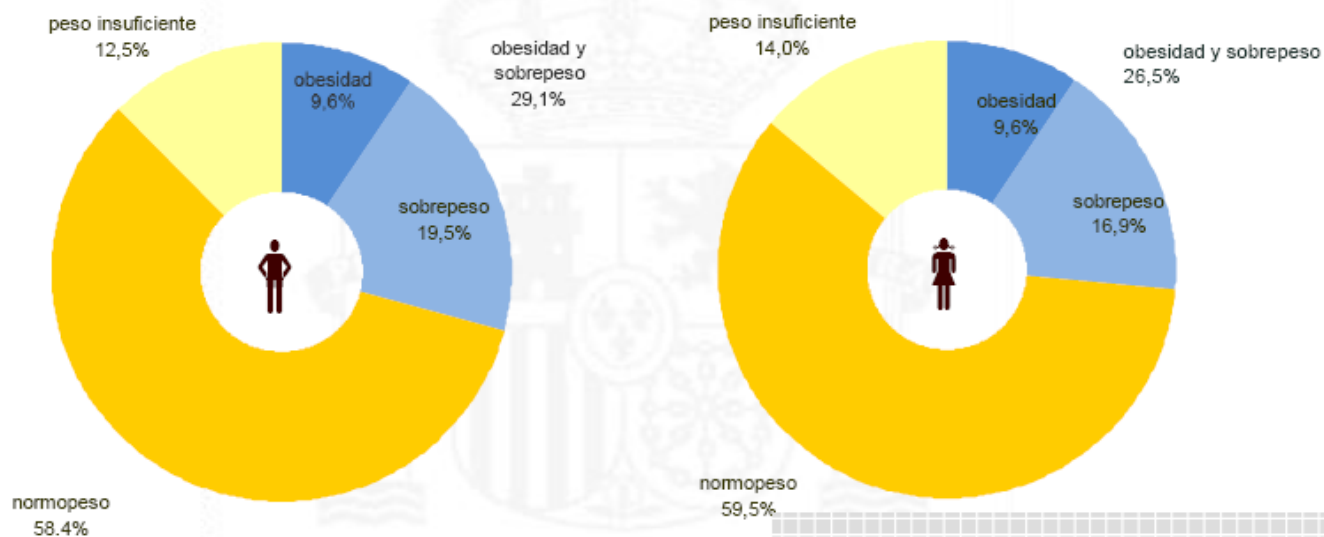
Obesidad y sobrepeso adultos - evolución población 18 y + años



PRESENTACION ENSE 2011-2012



Índice de masa corporal (IMC) infantil población 2 a 17 años



De cada 10 niños → 1 obeso
→ 2 sobrepeso

el **27,8%**
de la población de más de 12 a 17
años padece obesidad o
sobrepeso

Obesidad y sobrepeso infantil - evolución población de 2-17 años



PRESENTACION ENSE 2011-2012

The evolution of human adiposity and obesity: where did it all go wrong?

Jonathan C. K. Wells¹

Disease Models & Mechanisms 5, 595-607 (2012) doi:10.1242/dmm.009613

Because obesity is associated with diverse chronic diseases, little attention has been directed to the multiple beneficial functions of adipose tissue. Adipose tissue not only provides energy for growth, reproduction and immune function, but also secretes and receives diverse signaling molecules that coordinate energy allocation between these functions in response to ecological conditions. Importantly, many relevant ecological cues act on growth and physique, with adiposity responding as a counterbalancing risk management strategy. The large number of individual alleles associated with adipose tissue illustrates its integration with diverse metabolic pathways. However, phenotypic variation in age, sex, ethnicity and social status is further associated with different strategies for storing and using energy. Adiposity therefore represents a key means of phenotypic flexibility within and across generations, enabling a coherent life-history strategy in the face of ecological stochasticity. The sensitivity of numerous metabolic pathways to ecological cues makes our species vulnerable to manipulative globalized economic forces. The aim of this article is to understand how human adipose tissue biology interacts with modern environmental pressures to generate excess weight gain and obesity. The disease component of obesity might lie not in adipose tissue itself, but in its perturbation by our modern industrialized niche. Efforts to combat obesity could be more effective if they prioritized 'external' environmental change rather than attempting to manipulate 'internal' biology through pharmaceutical or behavioral means.

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Can a Statin Neutralize the Cardiovascular Risk of Unhealthy Dietary Choices?

Emily A. Ferenczi, MBChB*, Perviz Asaria, MPH, Alan D. Hughes, PhD, Nishi Chaturvedi, MD, and Daniel F. Francis, FRCP

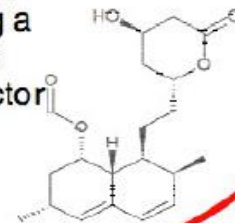
The cardiovascular risk reduction associated with different statins for the prevention of cardiovascular disease and the cardiovascular risk increase associated with excess dietary intake of fat have been quantified. However, these relative risks have never been directly juxtaposed to determine whether an increase in relative risk by 1 activity could be neutralized by an opposing change in relative risk from a second activity. The investigators compared the increase in relative risk for cardiovascular disease associated with the total fat and trans fat content of fast food against the relative risk decrease provided by daily statin consumption from a meta-analysis of statins in primary prevention of coronary artery disease (7 randomized controlled trials including 42,648 patients). The risk reduction associated with the daily consumption of most statins, with the exception of pravastatin, is more powerful than the risk increase caused by the daily extra fat intake associated with a 'not hamburger' (Quarter Pounder®) with cheese and a small milkshake. In conclusion, statin therapy can neutralize the cardiovascular risk caused by harmful diet choices. In other spheres of human activity, individuals choosing risky pursuits (smoking, drinking, driving) are advised or compelled to use measures to minimize the risk (safety equipment, filters, seatbelts). Likewise, some individuals eat unhealthily. Statins are not a rational modern means to offset the cardiovascular risk. Fast food outlets already offer free modifications to supplement meals. A free statin-containing accompaniment would offer cardiovascular benefits, opposite to the effects of equally available salt, sugar, and high-fat condiments. Although no substitute for systematic lifestyle improvements including healthy diet, regular exercise, weight loss, and smoking cessation, complementary statin packets would not, at little cost, 1 positive choice to a paragraph of negative ones. © 2010 Elsevier Inc. All rights reserved. (Am J Cardiol 2010;106:587-592)

MacStatin



I'm neutralizin' it

No tablet can completely neutralise the harm to your individual health from eating unhealthily. Better ways to reduce your risk of death from heart attack include: eating healthily, exercising, maintaining a healthy weight and not smoking. See your doctor for complete advice



EL TRASFONDO ECONÓMICO DE LAS INTERVENCIONES SANITARIAS EN LA PREVENCIÓN DE LA OBESIDAD

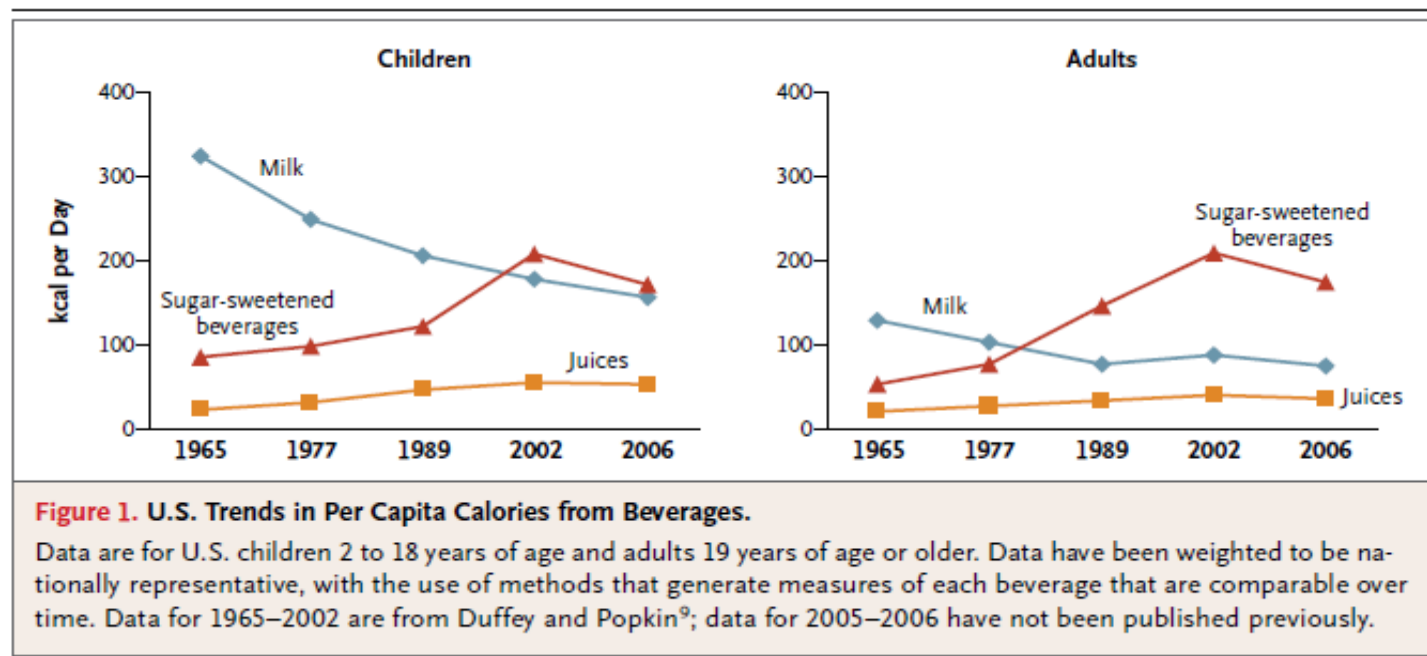
Alejandro Rodríguez Caro y Beatriz González López-Valcárcel

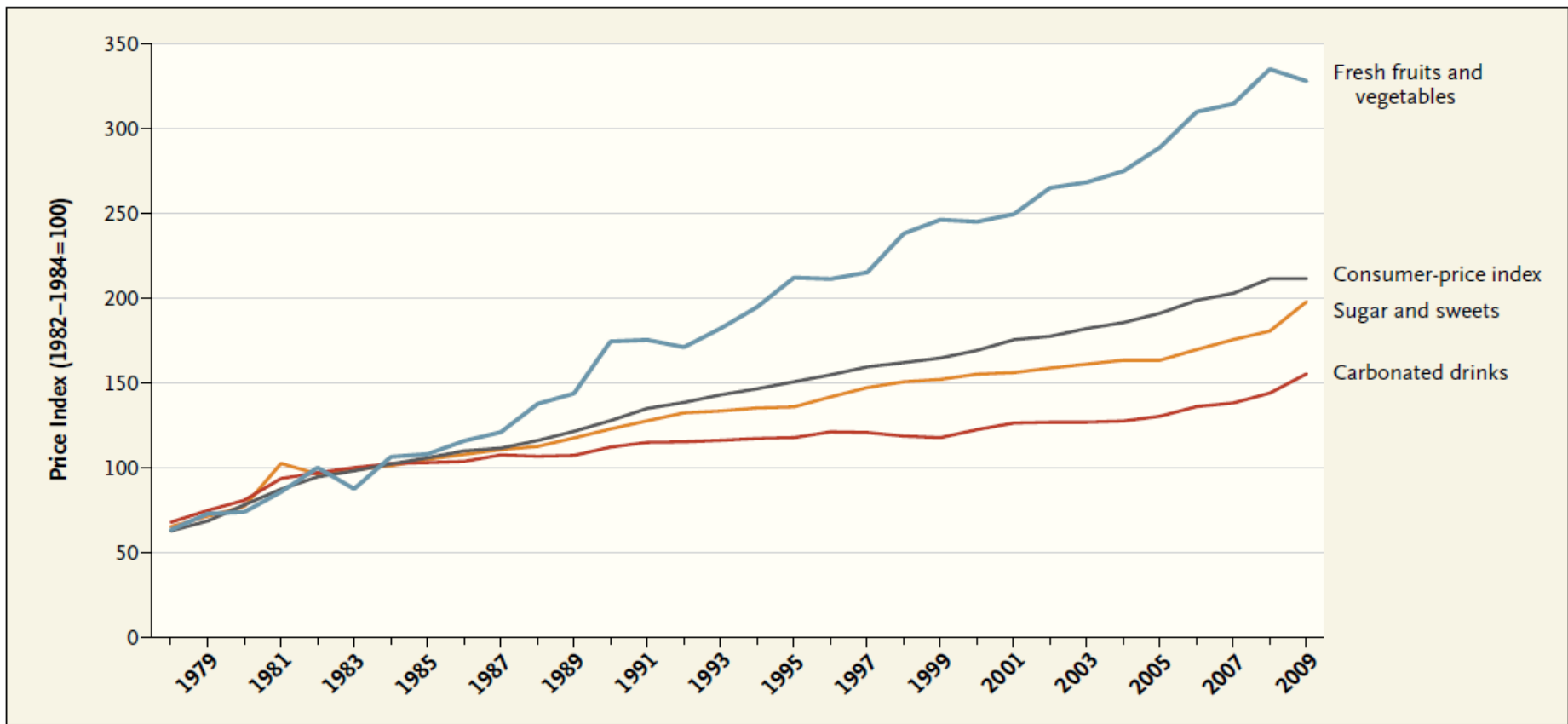
El coste macroeconómico de la obesidad

País (Año)	Coste total de la obesidad	Coste en porcentaje del gasto total en salud	Observaciones
Canadá (1997) (26)	1,8 billones de \$	2,4% Gasto total en salud	IMC \geq 27
Nueva Zelanda (1991) (27)	135 millones de \$ NZ	2,5% Gasto total en salud	IMC \geq 30
Australia (1989) (28)	395 millones de \$ Australianos	2% Gasto total en salud	IMC \geq 30
Francia (1992) (29)	11,89 billones de Francos	2% Gasto total en salud	IMC \geq 27
Holanda (30)	1 billón de Florines	4% Gasto total en salud	IMC \geq 25
Reino Unido (2002) (31)	3,23 billones de libras	4,6% Gasto total en salud	IMC \geq 25
	66.737 muertes	7,3% total de muertes	IMC \geq 25
Estados Unidos (1998) (30)	78,5 billones de \$	9,1% Gasto total en salud	IMC \geq 25
	47,5 billones de \$	5,50% Gasto total en salud	IMC \geq 30
China Continental (2003) (32)	2,74 billones de \$	3,7% Gasto total en salud	IMC \geq 24
Canadá (2004) (33)	6,881-9,927 muertos (Intervalo del confianza al 95%)		IMC \geq 30
Brasil (2001) (34)	Coste total de hospitalización: 841.273.181\$ 462.918.784\$ Hombre + 378.354.397\$ Mujeres	Porcentaje del coste total de hospitalización: 3.02% (1,94% + 1,08%) hombres 5.83% (2,76%+3,07%) mujeres	IMC \geq 25 Datos entre paréntesis para sobrepeso (IMC \geq 25) y obesidad (IMC \geq 30)
Suiza (2001) (35)	2691 millones de francos suizos	2,9% del gasto total	IMC \geq 25
Suecia (36)	390 millones de Euros	1,9% del gasto total	

The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages

Kelly D. Brownell, Ph.D., Thomas Farley, M.D., M.P.H., Walter C. Willett, M.D., Dr.P.H.,
Barry M. Popkin, Ph.D., Frank J. Chaloupka, Ph.D., Joseph W. Thompson, M.D., M.P.H.,
and David S. Ludwig, M.D., Ph.D.





Relative Price Changes for Fresh Fruits and Vegetables, Sugars and Sweets, and Carbonated Drinks, 1978–2009.

Data are from the Bureau of Labor Statistics and represent the U.S. city averages for all urban consumers in January of each year.

The Real Contribution of Added Sugars and Fats to Obesity

Adam Drewnowski

Obesity rates in the United States are a function of socioeconomic status. Higher rates are found among groups with lower educational and income levels, among racial and ethnic minorities, and in high-poverty areas. Yet, the relation between obesity, nutrition, and diet continues to be viewed in biologic terms, with the search for likely causes focused on consumption of specific macronutrients, foods, or food groups. Epidemiologic evidence linking diet composition and body weight has mostly relied on ecologic comparisons, time trends, and analyses of cross-sectional studies. Plausible physiologic mechanisms have included the metabolic effects of dietary components, mostly sugars and fats, on regulation of food intake and deposition of body fat. However, the evidence could not have been convincing since the blame for rising obesity rates seems to shift regularly, every 10 years or so, from fats to sugars and then back again. This review demonstrates that much of past epidemiologic research is consistent with a single parsimonious explanation: obesity has been linked repeatedly to consumption of low-cost foods. Refined grains, added sugars, and added fats are inexpensive, good tasting, and convenient. The fact that energy-dense foods (megajoules/kilogram) cost less per megajoule than do nutrient-dense foods means that energy-dense diets are not only cheaper but may be preferentially selected by the lower-income consumer. In other words, the low cost of dietary energy (dollars/megajoule), rather than specific food, beverage, or macronutrient choices, may be the main predictor of population weight gain. Examining past studies of the contribution of added sugars and fats to obesity rates through the prism of food prices and diet costs is the purpose of this review.

Background and objective: The increasing prevalence of childhood obesity has led to interest in its prevention, particularly through school-based and family-based interventions in the early years. Most evidence reviews, to date, have focused on individual behaviour change rather than the 'obesogenic environment'.

Objective: This paper reviews the evidence on the influence of the food environment on overweight and obesity in children up to 8 years.

Data sources: Electronic databases (including MEDLINE, EMBASE, Cochrane Controlled Trials Register (CCTR), DARE, CINAHL and Psycho-Info) and reference lists of original studies and reviews were searched for all papers published up to 31 August 2011.

Study selection: Study designs included were either population-based intervention studies or a longitudinal study. Studies were included if the majority of the children studied were under 9 years, if they related to diet and if they focused on prevention rather than treatment in clinical settings.

Data extraction: Data included in the tables were characteristics of participants, aim, and key outcome results. Quality assessment of the selected studies was carried out to identify potential bias and an evidence ranking exercise carried out to prioritise areas for future public health interventions.

Data synthesis: Thirty-five studies (twenty-five intervention studies and ten longitudinal studies) were selected for the review. There was moderately strong evidence to support interventions on food promotion, large portion sizes and sugar-sweetened soft drinks.

Conclusions: Reducing food promotion to young children, increasing the availability of smaller portions and providing alternatives to sugar-sweetened soft drinks should be considered in obesity prevention programmes aimed at younger children. These environment-level interventions would support individual and family-level behaviour change.



The influence of the food environment on overweight and obesity in young children: a systematic review

Article focus

- Prevalence of childhood obesity remains high.
- Interventions to reduce obesity appear to be shifting from an individual focus to a more societal approach.
- This paper systematically reviews the evidence linking obesity and diet-related environmental factors.

Key messages

- The three environmental exposures identified as having the most impact were the availability of sugar-sweetened beverages; portion sizes and food promotion.
- Reduction of these three elements is likely to hold promise in obesity prevention among children.

Strengths and limitations of this study

- There was an absence of evidence for a number of environmental factors.
- Anthropometric outcome measures were not made in all the studies.
- A number of the intervention studies included were of short duration with short follow-up periods.

Study and country	Design and duration	Population and age at time of outcome assessment	Aim	Results
Mrdjenovic and Levitsky ³⁷ the USA	Non-randomised controlled trial ;Pretest/post-test 8 weeks	Children aged 6–13 years (n=30)	To test effect of sweetened drink consumption on energy balance	Sweetened drink consumption of >12 oz/day was related to weight gain of 1.12±0.7 kg
Muckelbauer <i>et al</i> ⁴¹ Germany	Non-RCT 12 months	Children aged 6–8 years (n=2950)	To test whether promotion of consumption of water was effective in overweight prevention	Reduction in risk of overweight in intervention versus control (OR=0.69; 95% CI 0.48 to 0.98)
James <i>et al</i> ⁴² the UK	Cluster RCT 12 months	Children aged 8–9 years (n=644)	To test whether a programme to reduce soft drink consumption can prevent weight gain	Decrease in obesity in intervention compared to control group (–0.2% vs 7.5%: difference 7.7%; 95% CI 2.2% to 13.1%)
Karanja <i>et al</i> ⁴⁰ the USA	RCT 2 years	Children followed from birth to 2 years (n=178)	To prevent excess weight gain in American-Indian and Alaskan native toddlers by promoting breastfeeding and curtailment of sugar-sweetened beverage consumption	Significantly less increase in BMI z-scores was observed among the intervention group compared to the control group (p=0.016)

Box 1 Areas for dietary determinants of obesity, as derived from stakeholder workshops

- ▶ Desire for highly palatable foods
- ▶ Demand for easy to prepare food and individual meals
- ▶ Food promotion
- ▶ Large portions
- ▶ High-energy snack foods
- ▶ Sugar-sweetened soft drinks
- ▶ Food availability and access
- ▶ Restaurants, fast food outlets and coffee bars
- ▶ School and nursery catering

CONCLUSION

This review has identified three areas in which the evidence is growing to support interventions on the food environment of young children, that is, reducing promotion of high-fat, high-sugar foods, making smaller portion sizes available and providing alternatives to sugar-sweetened soft drinks. More research is needed to strengthen the evidence on interventions in these areas, for example, on the optimal design and delivery of the interventions, and the impact on body weight and BMI rather than food intake. For other areas, there was an absence of evidence which needs to be addressed.



Calories from Soft Drinks — Do They Matter?

Sonia Caprio, M.D.

The increase in consumption of sugar-sweetened beverages among both adults and children in the United States and other countries is considered a potential contributor to the obesity pandemic.^{5,6} Sugar intake from sugar-sweetened beverages alone, which are the largest single caloric food source in the United States, approaches 15% of the daily caloric intake in several population groups.^{7,8} Adolescent boys in the United States consume an average of 357 kcal of the beverages per day.⁸ Sugar-sweetened beverages are marketed extensively to children and adolescents, and large increases in consumption of sugar-sweetened beverages have occurred among black and Mexican-American youth,^{8,9} who are known to be at higher risk for obesity and the development of type 2 diabetes than their white counterparts.¹⁰

Three studies now published in the *Journal*, by de Ruyter et al.,¹² Ebbeling et al.,¹³ and Qi et al.,¹⁴

These randomized, controlled studies — in particular, the study by de Ruyter et al. — provide a strong impetus to develop recommendations and policy decisions to limit consumption of sugar-sweetened beverages, especially those served at low cost and in excessive portions, to attempt to reverse the increase in childhood obesity. Such interventions, if successful, may also help prevent the development of type 2 diabetes and its complications in youth.

Taken together, these three studies suggest that calories from sugar-sweetened beverages do matter. Furthermore, policy decisions about sugar-sweetened beverages should not be considered in isolation. Other strategies to achieve and maintain normal weight, including increasing physical activity, will be important to stem the obesity epidemic and its effects. The time has come to take action and strongly support and implement the recommendations from the Institute of Medicine, the American Heart Association, the Obesity Society, and many other organizations to reduce consumption of sugar-sweetened beverages in both children and adults.

EL TRASFONDO ECONÓMICO DE LAS INTERVENCIONES SANITARIAS EN LA PREVENCIÓN DE LA OBESIDAD

Alejandro Rodríguez Caro y Beatriz González López-Valcárcel

Intervención	Coste-efectividad (e intervalo del análisis de sensibilidad)
1. Niños de la escuela primaria caminando al colegio (el “bus que camina”)	No
2. Programas de transporte activo para niños de escuelas primarias (Travel SMART Schools)	No, salvo que los costes conjuntos se imputen a los objetivos de transporte y de salud
3. Programa comunitario activo para después del colegio	No
4. Orlistat (junto con ejercicio, dieta y terapia de modificación de conducta) a los adolescentes (1 año)	\$14,000 (\$8,000; \$36,000)
5. Intervención familiar por el médico de cabecera dirigida a niños con sobrepeso y con obesidad moderada (12 semanas)	\$32,000 (15,000, infinito)
6. Intervención de múltiples facetas basada en el colegio sin educación física activa (Israel) 2 años	Todos: \$14,000 (\$6,000, dominada); Niñas: \$21,000 ; Niños: \$42,000
7. Dispositivo gástrico ajustable por laparoscopia a adolescentes (14-19 años) con IMC 35	\$10,000 (\$9,000; \$12,000)
8. Programa escolar de promoción de la salud para reducir el tiempo de exposición a la TV (6 meses) Ensayo clínico EEUU	\$3,000 (\$1,500, \$7,000)
9. Intervención de múltiples facetas basada en el colegio, con ejercicio físico activo (Programa “Conoce tu cuerpo”). EEUU	Coste-efectivo y ahorrador de costes
10. Intervención de educación nutricional en la escuela para reducir el consumo de bebidas carbonatadas azucaradas. Niños de 7 a 11 años	Coste-efectivo y ahorrador de costes
11. Programa basado en la familia dirigido a niños obesos. (Suecia) 14-18 meses	Coste-efectivo y ahorrador de costes
12. Intervención de múltiples facetas basada en el colegio dirigida a niños obesos y con sobrepeso entre 7 y 10 años	Coste-efectivo y ahorrador de costes
13. Reducción de la publicidad en TV de alimentos y bebidas con alto contenido en grasas y/o azúcar dirigidos a los niños hasta 14 años	Coste-efectivo y ahorrador de costes

Compliance with self-regulation of television food and beverage advertising aimed at children in Spain

NS Public Health Nutrition

doi:10.1017/S1368980009991984

M^a Mar Romero-Fernández^{1,*}, Miguel Ángel Royo-Bordonada² and Fernando Rodríguez-Artalejo^{3,4}

Table 2 Overall compliance with the PAOS Code* by advertisementst of companies that agreed to the Code

	Compliant		Non-compliant		Uncertain compliance		P‡
	n	%	n	%	n	%	
Day of broadcast							0.134
Weekday	20	40.8	22	44.9	7	14.2	
Saturday	41	26.6	78	50.6	35	22.7	
Television network							0.259
TVE1	24	37.5	24	37.5	16	25.0	
Antena 3	17	27.0	34	54.0	12	19.0	
TeleMadrid	13	29.5	21	47.7	10	22.7	
Canal Sur	7	21.9	21	65.6	4	12.5	
Origin of company							<0.001
Spain	19	38.8	10	20.4	20	40.8	
France	11	17.5	52	82.5	0	—	
Rest of Europe§	23	56.1	4	9.8	14	34.1	
USA	8	16.0	34	68.0	8	16.0	
Type of food							<0.001
Dairy	15	21.7	52	75.4	2	2.9	
Meat/meat products	0	—	16	94.1	1	5.9	
Cereals	6	21.4	8	28.6	14	50.0	
Pizzas	9	100.0	0	—	0	—	
Pastries/bakery goods	6	24.0	6	24.0	13	52.0	
Soft drinks	1	11.1	1	11.1	7	77.8	
Soluble cocoa	14	66.7	7	33.3	0	—	
Other	10	62.5	1	6.2	5	31.2	

Evaluation of food and beverage television advertising during children's viewing time in Spain using the UK nutrient profile model

M^a Mar Romero-Fernández^{1,2,*†}, Miguel Angel Royo-Bordonada¹ and Fernando Rodríguez-Artalejo^{3,4}

Objective: To evaluate the nutritional quality of products advertised on television (TV) during children's viewing time in Spain, applying the UK nutrient profile model (UKNPM).

Design: We recorded 80 h of four general TV station broadcasts during children's viewing time in May and June 2008, and identified all advertisements for foods and beverages. Nutritional information was obtained from the product labels or websites and from food composition tables. Each product was classified as healthy (e.g. gazpacho, a vegetable juice) or less healthy (e.g. potato crisp snacks) according to the UKNPM criteria.

Setting: Four free-of-charge TV channels in Spain: two national channels and two regional ones.

Subjects: TV commercials of food and beverages.

Results: A total of 486 commercials were broadcast for ninety-six different products, with a mean frequency of 5.1 advertisements per product. Some 61.5% of the ninety-six products were less healthy, and the percentage was higher for foods (74.1%). All (100%) of the breakfast cereals and 80% of the non-alcoholic drinks and soft drinks were less healthy. Of the total sample of commercials, 59.7% were for less healthy products, a percentage that rose to 71.2% during children's reinforced protection viewing time.

Conclusions: Over half the commercials were for less healthy products, a proportion that rose to over two-thirds during the hours of special protection for children. This suggests that applying the UKNPM to regulate food advertising during this slot would entail the withdrawal of most food commercials in Spain. TV advertising of products with low nutritional quality should be restricted.

Table 1 Evaluation of food products advertised on four Spanish television channels in May and June 2008, according to the UK nutrient profile model

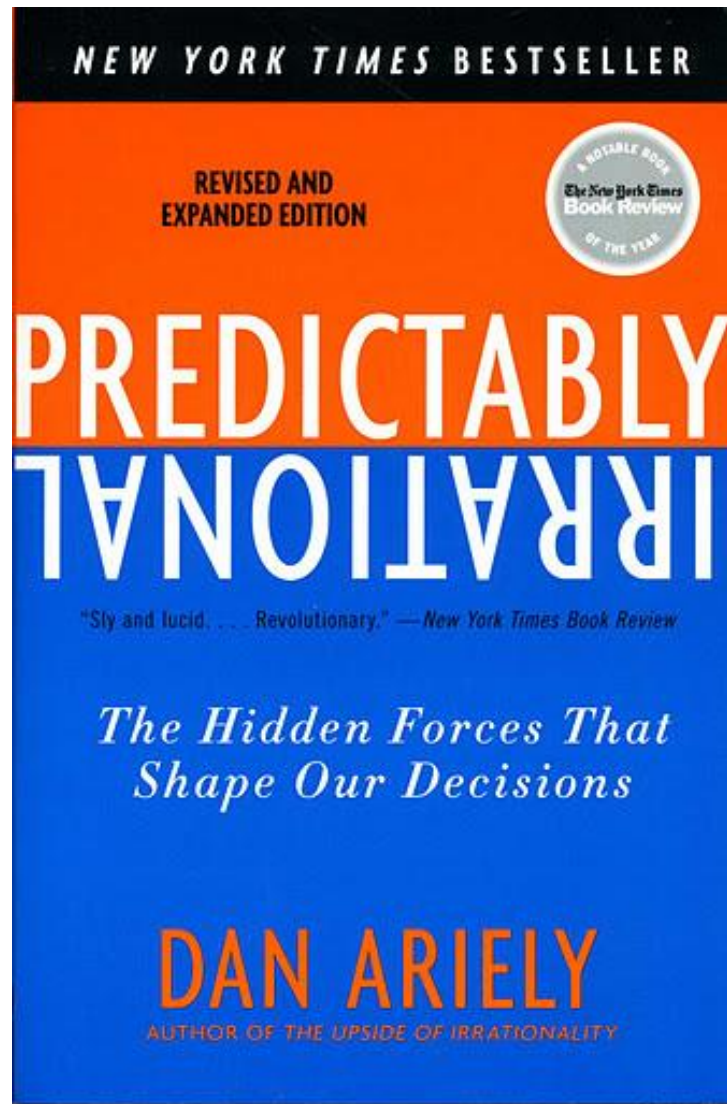
	Total <i>n</i>	Less healthy	
		<i>n</i>	%
Product type			
Beverage	38	16	42.1
Food	58	43	74.1
Food category			
Biscuits, cakes and pastry mix	7	6	85.7
Bread and bakeries	1	0	0
Breakfast cereals	8	8	100.0
Cereal bars	4	4	100.0
Cheese and cheese products	3	2	66.7
Chewing gum and sugars confection	4	2	50.0
Chocolate spreads	1	1	100.0
Chocolates	3	3	100.0
Coffee (fresh and instant) and cocoa (instant)	7	4	57.1
Dietary substitutes	1	1	100.0
Juices	3	0	0
Liquid yoghurts	7	4	57.1
Meat hamburgers and cold meat	6	6	100.0
Milk	4	0	0
Milk-based desserts and ice cream	9	3	33.3
Non-alcoholic drinks and soft drinks	10	8	80.0
Pizzas	2	2	100.0
Potato crisp snacks	2	2	100.0
Prepared soups	1	0	0
Rice	1	0	0
Sauces/dressing	4	3	75.0
Vegetables	2	0	0
Water	6	0	0
Total	96	59	61.5

EL TRASFONDO ECONÓMICO DE LAS INTERVENCIONES SANITARIAS EN LA PREVENCIÓN DE LA OBESIDAD

Alejandro Rodríguez Caro y Beatriz González López-Valcárcel

Análisis microeconómico de la obesidad. Fallos del mercado y argumentos que justifican las intervenciones de salud pública

Argumento que justifica la intervención	Tipos de intervención
1. Falta de información	Regulación del etiquetado (etiqueta verde de la UE). Más exigencias sobre información de los alimentos, publicidad, etc.
2. Externalidades (el coste de las conductas del individuo recae, al menos parcialmente, en otros) <ul style="list-style-type: none">• “Contagio” (interacción social)• Externalidades financieras: todos pagamos los mayores costes de atención sanitaria de los obesos	Incentivos “directos”: cambiar precios <ul style="list-style-type: none">• Impuestos <i>sobre el pecado</i> (“<i>Obesity-Tax</i>”)• Subvenciones a los alimentos saludables
3. Abuso moral (conductas oportunistas) <ul style="list-style-type: none">• <i>Ex ante</i>: no me cuido porque ya me cuidará el SNS• <i>Ex post</i>: ya que soy obeso, exijo tratamiento farmacológico para reducir peso en vez de esforzarme	Incentivos “indirectos” <ul style="list-style-type: none">• Ejemplo Reino Unido: las obesas quedan fuera de los programas de fecundación <i>in vitro</i>• El papel del mercado (de seguros): las empresas no contratan obesos• Políticas de financiación pública de medicamentos (co-pagos)
4. La salud es un bien tutelar. Debe ser protegida, incluso imponiéndose a la persona El individuo es irracional o tiene racionalidad limitada <ul style="list-style-type: none">• Obesidad como adicción	Intervenciones para cambiar preferencias. Educación sanitaria, publicidad, Marketing viral Prevención primaria de la obesidad



Carta a la directora

**¿Pueden contribuir las industrias alimentaria
y de la publicidad a prevenir la obesidad infantil
y promover hábitos saludables?**

***Can the advertising and food industries help prevent
childhood obesity and promote healthy lifestyles?***

Resulta cada vez más evidente que las tácticas de las industrias alimentaria y de la publicidad para oponerse con fuerza a la regulación estatal y promover la autorregulación por vía de acuerdos voluntarios son similares a las utilizadas previamente por las industrias del tabaco y el alcohol, cuya autorregulación se ha demostrado inefectiva y contraproducente para la salud pública⁵. No debería sorprendernos, puesto que los intereses económicos de ambas industrias están directamente ligados al incremento del consumo de los productos anunciados, en su mayoría altamente energéticos y pobres en nutrientes, en clara contraposición con los objetivos de salud pública. Por tanto, si se desea contribuir eficazmente a prevenir la obesidad infantil y promover hábitos saludables, urge establecer mecanismos de regulación estatal que prohíban cualquier tipo de publicidad dirigida a menores de alimentos y bebidas ricos en grasas saturadas, ácidos grasos trans, azúcares libres o sal.

Miguel Ángel Royo-Bordonada

Asociación Madrileña de Salud Pública, Madrid, España
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Panel 4: Recommendations of action for non-communicable diseases

For public health policy making, research, and programmes

- Unhealthy commodity industries should have no role in the formation of national or international policy for non-communicable diseases
- Interactions with the tobacco industry should be restricted and made consistent with recommendations of the Framework Convention on Tobacco Control
- Discussions with unhealthy commodity industries should be with government only and have a clear goal of the use of evidence-based approaches by government
- In the absence of robust evidence for the effectiveness of self-regulation or private-public partnership in alcohol, food, and drink industry, rigorous, timely, and independent assessment is needed to show that they can improve health and profit

For public health professionals, institutions, and civil society

- Highly engaged, critical action is needed to galvanise an evidence-based constituency for change to implement effective and low-cost policies, to place direct pressure on industry to change, and to raise public awareness of the unhealthy effects of these industries
- Funding and other support for research, education, and programmes should not be accepted from the tobacco, alcohol, and ultra-processed food and drinks industries or their affiliates and associates

For governments and international intergovernmental agencies

- Evidence-based approaches such as legislation, regulation, taxation, pricing, ban, and restriction of advertising and sponsorship should be introduced to reduce death and disability from non-communicable diseases

For governments, foundations, and other funding agencies

- All approaches in the prevention and control of non-communicable diseases—ie, self-regulation, public-private partnerships, legislation, pricing, and other regulatory measures—should be independently and objectively monitored
- Funding of policy development research into modes of regulation and market interventions should be accelerated and prioritised
- A new scientific discipline that investigates industrial diseases and the transnational corporations that drive them, should be developed



New York Plans to Ban Sale of Big Sizes of Sugary Drinks



Chang W. Lee/The New York Times

Mayor Michael R. Bloomberg on Wednesday with Linda I. Gibbs, deputy mayor for health, as he discussed a plan to ban large sugary beverages. Next to each soda is the amount of sugar in it.



La Federación Hispana y la Asociación Nacional para el Progreso de la Gente de Raza Negra (NAACP, por sus siglas en inglés), se sumaron a la campaña legal encabezada por la Asociación Estadounidense de Productores de Bebidas contra esta disposición al considerar que dañaría particularmente a las tiendas y restaurantes pequeños cuyos dueños pertenecen a minorías étnicas.

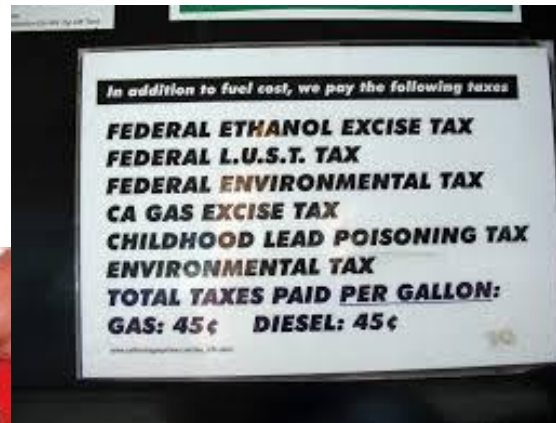
Richard H. Thaler
Cass R. Sunstein

UN PEQUEÑO EMPUJÓN (Nudge)



El empujón que necesitas para tomar
las mejores decisiones en salud,
dinero y felicidad





¿De qué dependen las consecuencias de los impuestos?

- De la naturaleza(sobre el valor económico; especial sobre el bien o producto. Impuestos indirectos)
- De lo que se tasa (sobre exceso de carbohidrato – sacarosa; jarabe de fructosa; no calórico...-- peso de azúcar por volumen, por envase, etc.)
- De la elasticidad del precio (propia; cruzada, según capacidad adquisitiva; a corto, a medio plazo)
- De otros factores que afecten el consumo de los productos que se quieren afectar
- De las eventuales alternativas del consumidor

Propuesta

- Elaboración de un glosario para los socios de SESPAS (epidemiólogos; investigadores y salubristas profesionales; gestores, etc.) sobre Elasticidades de precios y modelos econométricos de cálculo (funciones compensadas o no compensadas de demanda; condicionales o incondicionales; estimaciones empíricas –Rotterdam; LES; AIDS, etc.

The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages

Kelly D. Brownell, Ph.D., Thomas Farley, M.D., M.P.H., Walter C. Willett, M.D., Dr.P.H.,
Barry M. Popkin, Ph.D., Frank J. Chaloupka, Ph.D., Joseph W. Thompson, M.D., M.P.H.,
and David S. Ludwig, M.D., Ph.D.

CONSUMPTION TRENDS AND HEALTH OUTCOMES

MECHANISMS LINKING SUGAR-SWEETENED BEVERAGES WITH POOR HEALTH

ECONOMIC RATIONALE

AN EFFECTIVE TAX POLICY AND PROJECTED EFFECTS

REVENUE-GENERATING POTENTIAL

OBJECTIONS, INDUSTRY REACTION, PUBLIC SUPPORT, AND FRAMING

As with any public health intervention, the precise effect of a tax cannot be known until it is implemented and studied, but research to date suggests that a tax on sugar-sweetened beverages would have strong positive effects on reducing consumption.^{5,33} In addition, the tax has the potential to generate substantial revenue to prevent obesity and address other external costs resulting from the consumption of sugar-sweetened beverages, as well as to fund other health-related programs. Much as taxes on tobacco products are routine at both state and federal levels because they generate revenue and they confer a public health benefit with respect to smoking rates, we believe that taxes on beverages that help drive the obesity epidemic should and will become routine.

CONCLUSIONS

Un impuesto sobre las bebidas azucaradas es bueno para la salud de la población y para el Tesoro Público

Brownell KD, Farley T, Willett WC, Popkin BM, Chaloupka FJ, Thompson JW, Ludwig DS.

The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages. NEJM 361;16 15 Oct 2009: 1599-605.

El informe, excelentemente estructurado y escrito, hace una propuesta concreta sobre el impuesto y cuantifica su efecto esperado. Hay tres aspectos que definen el impuesto: 1) *Qué se grava*. Proponen gravar todas las bebidas con azúcar añadido, dejando fuera, de momento, las que añaden edulcorantes no calóricos, porque son sólo sospechas científicas, que no evidencia, las que asocian la cola-cero con el aumento de la obesidad, vía cambio de gusto por lo dulce y descargo de la conciencia obesa; 2) *Tipo de impuesto*, específico (gravar cada cc de bebida con una tarifa fija) versus *ad valorem* (porcentaje de las ventas). No hay ninguna duda (tampoco con el tabaco) que el primero se ajusta mejor al objetivo de reducir el consumo y es menos manipulable por la industria. Eso sí, hay que ajustar la tarifa periódicamente para que la inflación no la erosione; 3) *Cuánta* del impuesto. Con el céntimo de \$ por onza (20 ml) que proponen, una lata de refresco de tamaño estándar en España (33cc) soportaría un impuesto de \$1,12.

Una de las dudas siempre es su regresividad, si los pobres se verán injustamente más afectados. Los autores concluyen que bien al contrario, serán los grandes beneficiados porque al ser más sensible su demanda a los precios y al ser más obesos, reducirán más el consumo y ganarán proporcionalmente más salud que los ricos delgados. Estas conclusiones parten de la premisa de que

los obesos son más elásticos (al precio), que habría que contrastar para España. Los efectos esperados dependen crucialmente de las estimaciones de la elasticidad precio. En España, poco o nada sabemos sobre esto, y es muy difícil poner en marcha experimentos para medir la elasticidad cruzada de las bebidas azucaradas respecto a los jugos naturales o al agua.

Policy Recommendations

TAX CONSIDERATIONS

- Excise tax (fee per ounce)
 - *Advantages*
 - consumers see the increased price at the point of purchase;
 - can be imposed at the bottler, distributor, wholesaler, or importer level, making it easier to collect;
 - does not change if industry reduces prices;
 - will include the syrup used in fountain drinks;
 - generates more stable and predictable revenues;
 - avoids the problem of encouraging consumers to buy larger containers.
 - *Special note*
 - Taxes should be indexed to inflation to avoid erosion of the impact as prices rise.

Policy Recommendations

TAX CONSIDERATIONS

- Sales tax (percentage of product's price).
 - *Advantage*
 - rises with inflation.
 - *Disadvantages*
 - may encourage consumers to buy larger containers because the cost per ounce is lower, so the tax per ounce would be lower as well;
 - retailers, especially small ones without computerized cash registers, may be inconvenienced by having to charge taxes on some beverages and not others. This may motivate them to become spokespersons for opposition or repeal.



PUBLIC HEALTH MESSAGE

- Make the public health message explicit to increase public support for a tax: the purpose is to fund nutrition programs and obesity prevention, to reduce consumption of unhealthy products, and to recoup costs for diet-related diseases now covered by public funds.
- Note that the tax is not just directed at obesity. Poor nutrition affects the health of everyone, overweight or not. In addition, children can develop habits and brand loyalties well in advance of becoming overweight.



USE OF THE REVENUE

- It is important, for reasons of public support and public health, to designate revenue produced by a tax for programs related to health and nutrition, obesity prevention, etc. Programs benefitting underserved populations are especially important.

Such initiatives could include:

- subsidies of fresh fruits and vegetables and other healthy foods:
 - in schools and communities;
 - for food stamp recipients, which can offset concerns that the tax is regressive.
- school initiatives:
 - incentive programs to improve all foods sold on school grounds;
 - funding for schools to meet national physical education time standards;
 - farm-to-school grants;
 - fully subsidize breakfast and lunch for low-income students;
 - safe routes to schools;
- statewide, comprehensive obesity prevention programs;
- improvements to the built environment for increased physical activity;
- incentives to attract supermarkets to low income neighborhoods;
- social marketing campaigns to counteract the marketing strategies used by food industries to advertise soft drinks and snacks to children.



INTENDED AND UNINTENDED CONSEQUENCES OF A PROPOSED NATIONAL TAX ON SUGAR-SWEETENED BEVERAGES TO COMBAT THE U.S. OBESITY PROBLEM

SENARATH DHARMASENA* and ORAL CAPPS JR

Monthly data derived from the Nielsen Homescan Panel for calendar years 1998 through 2003 are used to estimate the effects of a proposed tax on sugar-sweetened beverages (SSBs). Most arguments in describing the ramifications of a tax fail to consider demand interrelationships among various beverages. To circumvent this shortcoming we employ a variation of Quadratic Almost Ideal Demand System (QUAIDS) model. The consumption of isotonic, regular soft drinks and fruit drinks, the set of SSBs, is negatively impacted by the proposed tax, while the consumption of fruit juices, low-fat milk, coffee, and tea is positively affected. Diversion ratios are provided identifying where the volumes of the SSBs are directed as a result of the tax policy. The reduction in the body weight as a result of a 20% tax on SSBs is estimated to be between 1.54 and 2.55 lb per year. However, not considering demand interrelationships would result in higher weight loss. Unequivocally, it is necessary to consider interrelationships among non-alcoholic beverages in assessing the effect of the tax. Copyright © 2011 John Wiley & Sons, Ltd.

Table III. Estimated uncompensated own-price and cross-price elasticities and expenditure elasticities with associated p -values gleaned from the LA/QUAIDS model^a

	Isotonics	Regular soft drinks	Diet soft drinks	High-fat milk	Low-fat milk	Fruit drinks	Fruit Juices	Bottled water	Coffee	Tea	Expenditure elasticity
Isotonics	-3.8650 0.0000	-0.1216 0.9268	2.2073 0.1168	-0.8598 0.3375	0.5235 0.5092	-2.4720 0.0016	1.9803 0.0740	0.3722 0.6279	1.0631 0.1749	-0.0021 0.9960	1.1741 0.0621
Regular soft drinks	-0.0088 0.8852	-2.2552 0.0000	-0.6208 0.0020	0.0424 0.7146	0.2373 0.0218	-0.1663 0.0847	1.0338 0.0000	-0.0543 0.6143	0.2181 0.0632	0.0555 0.4083	1.5184 0.0000
Diet soft drinks	0.1509 0.1205	-0.8550 0.0037	-1.2721 0.0002	0.3856 0.0171	-0.1722 0.2117	0.3726 0.0063	-0.0963 0.6101	0.2475 0.0661	-0.0051 0.9707	-0.0121 0.8727	1.2562 0.0000
High-fat milk	-0.0544 0.3641	0.1964 0.2549	0.4359 0.0065	-0.7591 0.0009	0.2989 0.1350	-0.2219 0.0077	-0.5556 0.0000	0.0173 0.8388	-0.0185 0.8378	-0.1452 0.0056	0.8064 0.0000
Low-fat milk	0.0558 0.4916	0.6358 0.0068	-0.2009 0.3279	0.4435 0.1444	-0.9237 0.0027	-0.1448 0.1549	-0.4669 0.0039	-0.1537 0.1441	-0.0209 0.8501	-0.0793 0.1894	0.8552 0.0000
Fruit drinks	-0.2934 0.0017	-0.3659 0.1368	0.6436 0.0063	-0.4501 0.0023	-0.2044 0.0821	-0.6892 0.0005	0.0786 0.6925	-0.3446 0.0358	0.4709 0.0119	-0.0912 0.3270	1.2456 0.0000
Fruit juices	0.1069 0.0730	1.2844 0.0000	-0.0141 0.9250	-0.4326 0.0000	-0.2370 0.0049	0.0683 0.4559	-1.1731 0.0000	-0.0769 0.4681	-0.2526 0.0258	-0.0775 0.2437	0.8041 0.0000
Bottled water	0.0566 0.5842	0.0318 0.9199	0.5864 0.0282	0.0721 0.6687	-0.1784 0.1876	-0.3424 0.0680	-0.1532 0.5589	-0.7540 0.0119	-0.0455 0.8329	0.1965 0.1310	0.5301 0.0215
Coffee	0.1203 0.1571	0.6977 0.0138	0.0962 0.6620	0.0166 0.9091	0.0128 0.9120	0.4856 0.0055	-0.4584 0.0431	-0.0312 0.8580	-1.6459 0.0000	0.2442 0.0274	0.4620 0.0297
Tea	0.0019 0.9804	0.3359 0.2207	0.0117 0.9552	-0.4200 0.0037	-0.1524 0.1607	-0.1192 0.4184	-0.2967 0.1915	0.2448 0.1724	0.3893 0.0395	-0.9104 0.0000	0.9150 0.0000

Source: Nielsen Homescan Panel, 1998 through 2003, Calculations by the authors.

^aNumbers below the estimated elasticities represent p -values. Estimated elasticities in bold font indicate statistical significance at the 0.10 level.

Table VI. Direct effect of the proposed tax on sugar-sweetened beverages (using the average of last 12 months per capita consumption)

	Net % change in per capita quantities	Consumption Per Capita per month gallons	Consumption Per Capita per month gallons (with Tax)	Change in Consumption Per Capita per month gallons (due to Tax)	Change in Consumption Per Capita per month ounces (due to Tax)	Calories per 8 ounces ^a	Change in total calories per capita per month due to 20% tax on SSB
Isotonics	-77.30	0.02	0.00 ^b	-0.02	-1.98	63	-15.58
Regular soft drinks	-45.10	0.78	0.43	-0.35	-45.03	91	-512.24
Diet soft drinks	0.00	0.53	0.53	0.00	0.00	5	0.00
High-fat milk	0.00	0.46	0.46	0.00	0.00	135.5	0.00
Low-fat milk	0.00	0.31	0.31	0.00	0.00	83	0.00
Fruit drinks	-13.78	0.23	0.20	-0.03	-4.06	116	-58.84
Fruit juices	0.00	0.39	0.39	0.00	0.00	115	0.00
Bottled water	0.00	0.43	0.43	0.00	0.00	0	0.00
Coffee	0.00	0.81	0.81	0.00	0.00	2	0.00
Tea	0.00	0.31	0.31	0.00	0.00	2	0.00
Net Calories/month	-586.66						
1 lb body weight	3500 kcal						
Change in body weight per month	-0.17 lb/month						
Change in body weight per year	-2.01 lb/year						

Source: Computations by the authors.

^aCalories per 8 ounces of non-alcoholic beverages taken from Smith *et al.* (2010).

^bSmaller than 0.01.

Table IX. Direct and indirect effects of the proposed tax on sugar-sweetened beverages (using maximum per capita consumption)

	Net % change in per capita quantities	Consumption per capita per month gallons	Consumption per capita per month gallons (with Tax)	Change in consumption per capita per month gallons (due to Tax)	Change in consumption per capita per month ounces (due to Tax)	Calories per 8 ounces ^a	Change in total calories per capita per month due to 20% tax on SSB
Isotonics	-129.17	0.06	-0.02	-0.08	-9.92	63	-78.12
Regular soft drinks	-48.61	1.24	0.64	-0.60	-77.15	91	-877.55
Diet soft drinks	-6.63	0.72	0.67	-0.05	-6.11	5	-3.82
High fat milk	-1.60	0.67	0.66	-0.01	-1.37	135.50	-23.21
Low fat milk	10.94	0.53	0.59	0.06	7.42	83	76.97
Fruit drinks	-26.40	0.29	0.21	-0.08	-9.86	116	-142.09
Fruit juices	28.94	0.55	0.71	0.16	20.37	115	292.87
Bottled water	-5.08	0.52	0.49	-0.03	-3.38	0	0.00
Coffee	26.07	1.15	1.45	0.30	38.38	2	9.59
Tea	4.37	0.42	0.44	0.02	2.35	2	0.59
Net Calories/month	-744.77						
1 lb body weight	3500 kcal						
Change in body weight	-0.21 lb/month						
Change in body weight	-2.55 lb/year						

Source: Computations by the authors.

^aCalories per 8 ounces of non-alcoholic beverages taken from Smith *et al.* (2010).

Monthly data derived from the Nielsen Homescan Panel for calendar years 1998 through 2003 are used to estimate the effects of a proposed tax on SSBs. Own-price and cross-price elasticities are estimated using a linearized Quadratic AIDS model (LA/QUAIDS) for 10 non-alcoholic beverages: isotonics, regular soft drinks, diet soft drinks, high-fat milk, low-fat milk, fruit drinks, fruit juices, bottled water, coffee and tea. The consumption of isotonics, regular soft drinks, diet soft drinks, high-fat milk, bottled water and fruit drinks is negatively impacted by the proposed tax, on SSBs, while the consumption of fruit juices, low-fat milk, coffee and tea is positively affected. In particular, notable increases in the consumption of low-fat milk, fruit juices and coffee are evident. DRs are provided identifying where the volumes of the SSBs are directed as a result of the tax policy. Assuming a 20% tax imposed on SSBs, we conclude that the reduction of body weight on a per capita basis is relatively small, between 1.54 and 2.55 lb per year. If demand interrelationships among non-alcoholic beverages are not considered, this range of weight loss is 2.01–3.21 lb per capita per year. Unequivocally, it is necessary to consider interrelationships among non-alcoholic beverages in assessing the effect of the tax.

While the tax policy gives rise to intended consequences in reducing the consumption of SSBs, this effect is offset partially by a rise particularly in the consumption of fruit juices and coffee. Thus, the tax policy yields unintended consequences of increases in the consumption of coffee and increases in calories from fruit juices which contain natural sugars.

Owing to the nature of Nielsen Homescan Panel data, our study is limited in that it concentrates only on the at-home consumption of various non-alcoholic beverages. Another limitation rests concerns on the assumption of separability of non-alcoholic beverages from food and other beverage categories. With this assumption, we rule out direct and indirect effects of the proposed tax on these categories. Further research relaxing this assumption of separability may be worthwhile. Moreover, we report consequences of the proposed tax policy on a per person basis. Further efforts may be directed on below-poverty individuals and above-poverty individuals as well as on children and adults. Despite these limitations, our study adds value to the literature by pulling together a solid methodological approach to assess the consequences of a tax policy on SSBs to alleviate the obesity problem in the United States.

By Y. Claire Wang, Pamela Coxson, Yu-Ming Shen, Lee Goldman, and Kirsten Bibbins-Domingo

A Penny-Per-Ounce Tax On Sugar-Sweetened Beverages Would Cut Health And Cost Burdens Of Diabetes

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Foundation, Inc.

ABSTRACT Sugar-sweetened beverages are a major contributor to the US obesity and diabetes epidemics. Using the Coronary Heart Disease Policy Model, we examined the potential impact on health and health spending of a nationwide penny-per-ounce excise tax on these beverages. We found that the tax would reduce consumption of these beverages by 15 percent among adults ages 25–64. Over the period 2010–20, the tax was estimated to prevent 2.4 million diabetes person-years, 95,000 coronary heart events, 8,000 strokes, and 26,000 premature deaths, while avoiding more than \$17 billion in medical costs. In addition to generating approximately \$13 billion in annual tax revenue, a modest tax on sugar-sweetened beverages could reduce the adverse health and cost burdens of obesity, diabetes, and cardiovascular diseases.

EXHIBIT 1
Projections Of The Mean Downstream Health Effects Of A Penny-Per-Ounce Tax On Sugar-Sweetened Beverages, By Sex And Age

Group	Consumption of sugar-sweetened beverages (servings/day) ^a		Reduction in diabetes incidence (%)	Average reduction in weight (lbs.)	Reduction over 10 years in:				
	Baseline	Posttax			Diabetes person-years	Incidence of CHD	Myocardial infarctions	Strokes	Deaths
Both sexes, ages 25–64	0.56	0.47	2.6	0.9	2,377,000	95,000	30,000	8,000	26,000
Men									
Ages 25–44	0.79	0.67	3.4	1.3	497,000	22,000	4,000	500	4,000
Ages 45–64	0.49	0.42	2.3	0.7	1,044,000	54,000	20,000	4,000	15,000
Women									
Ages 25–44	0.63	0.53	2.8	0.9	268,000	5,000	800	500	2,000
Ages 45–64	0.33	0.28	1.6	0.4	568,000	14,000	4,700	3,000	5,000

SOURCE Authors' calculations. **NOTES** 95% confidence intervals have been omitted from this exhibit for brevity. A complete version of the exhibit is available in the online Appendix, as in Note 10. Assuming a penny-per-ounce tax reduces baseline consumption by 15 percent (6–24 percent). CHD is coronary heart disease. ^aBased on food frequency questionnaires in the National Health and Nutrition Examination Survey, 2003–06.

EXHIBIT 2**Projected Ten-Year Savings In Medical Costs From A Penny-Per-Ounce Tax On Sugar-Sweetened Beverages**

Group	Diabetes cost savings (\$ billions)	Cardiovascular disease cost savings unrelated to diabetes (\$ billions)	Total cost savings (\$ billions)
Both sexes, ages 25–64	9.6	7.4	17.1
Men			
Ages 25–44	1.6	1.5	3.2
Ages 45–64	4.6	3.5	8.1
Women			
Ages 25–44	0.9	0.9	1.8
Ages 45–64	2.5	1.6	4.1

SOURCE Authors' calculations. **NOTES** All amounts are in billions of US dollars, discounted by 3 percent a year. Numbers might not sum to totals because of rounding.



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Taxing Caloric Sweetened Beverages: Potential Effects on Beverage Consumption, Calorie Intake, and Obesity

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Abstract

The link between high U.S. obesity rates and the overconsumption of added sugars, largely from sodas and fruit drinks, has prompted public calls for a tax on caloric sweetened beverages. Faced with such a tax, consumers may reduce consumption of these sweetened beverages and substitute nontaxed beverages, such as bottled water, juice, and milk. This study estimated that a tax-induced 20-percent price increase on caloric sweetened beverages could cause an average reduction of 37 calories per day, or 3.8 pounds of body weight over a year, for adults and an average of 43 calories per day, or 4.5 pounds over a year, for children. Given these reductions in calorie consumption, results show an estimated decline in adult overweight prevalence (66.9 to 62.4 percent) and obesity prevalence (33.4 to 30.4 percent), as well as the child at-risk-for-overweight prevalence (32.3 to 27.0 percent) and the overweight prevalence (16.6 to 13.7 percent). Actual impacts would depend on many factors, including how the tax is reflected in consumer prices and the competitive strategies of beverage manufacturers and food retailers.

Effect of Beverage Tax May Differ in the Away-From-Home Market

Our results are based on a few assumptions typically found in demand studies. Like many other beverage demand studies, we used data from household purchases at grocery stores and did not include beverage purchases from other commercial outlets, such as restaurants and vending machines. One cannot ignore, however, the large amount of beverages purchased in eating establishments, such as fast food and full-service restaurants, ball games, movie theaters, and other away-from-home eating occasions. According to 2003-06 NHANES, about 50 percent of caloric sweetened beverages were consumed away from home.

In fast food and full-service restaurants, consumers often pay for a meal combo that includes beverages. Likewise, some restaurants offer free refills, creating a disconnect between quantity purchased and price. Because of these marketing conditions, consumers are likely to react differently to a price increase at home than away from home. While we acknowledge this potential problem, we note the difficulty in estimating the away-from-home demand for beverages due to data deficiencies. In this study, at-home elasticities are applied to total at-home and away-from-home consumption. This assumption has been made, but not pointed out, in past studies that estimate the impact of a tax on beverage consumption.

Calculating Changes in Calorie Consumption and Weight Status

The figure below represents a hypothetical individual's intake and the calculations used to derive changes in calorie intake and body weight. This method is carried out for all individuals in 2003-06 NHANES who drank caloric-sweetened beverages. Those who did not drink caloric sweetened beverages were unaffected by the tax.

We need only to consider the elasticities presented in the first column of appendix table 4. These elasticities reflect the percentage change in purchases from each beverage category due to a 1-percent change in the price of caloric sweetened beverages (A). Under our scenario, the price of caloric sweetened beverages increases by 20 percent due to a tax and must be reflected in the percentage change in purchases (B). To translate changes in consumption from purchase decisions, we must assume a one-to-one translation—the percentage change in purchases is equivalent to the percentage change in consumption. Multiplying column B by each individual's calorie intake from each beverage category (C) yields that individual's change in daily calorie intake (D). Averaging these changes in calorie intake (D) over the entire population yields the average change in daily calorie intake found in table 3. Assuming that 1 pound of body weight has about 3,500 calories, we calculate each NHANES respondent's weight reduction over 1 year (E). Each individual's new, hypothetical weight can be used to recalculate overweight and obesity prevalence for the U.S. population.

	(A) Elasticity	(B) Elasticity multiplied by 20 percent	(C) Individual daily intake ¹	(D) Change in individual daily intake	(E) Reduction in calories and weight
Beverages		Percent	Calories/day	Calories/day	
Caloric sweetened	-1.264	-25.28	216	-54.6	-39.5 calories/day
Diet	-0.457	-9.14	0	0	
Skim milk	0.198	3.96	0	0	-4.1 pounds/year
Low-fat milk	0.115	2.30	122	2.8	
Whole milk	0.222	4.44	0	0	
Juices	0.557	11.14	112	12.5	
Coffee/tea	-0.383	-7.66	2	-0.2	
Bottled water	0.749	14.98	0	0.0	

¹Example individual: Adult male, 5 foot 10 inches, weighing 175 pounds would have a BMI of 25.1—overweight. The calorie contents represent the following: 12 ounces of cola, 8 ounces of fruit drink, 8 ounces of 2 percent milk, 8 ounces of orange juice, and 8 ounces of unsweetened brewed tea. After the tax, assuming elasticities and all else constant, the adult male would lose 4.1 pounds of body weight over 1 year, reducing his BMI to 24.5—normal weight.

News Coverage of Sugar-Sweetened Beverage Taxes: Pro- and Antitax Arguments in Public Discourse

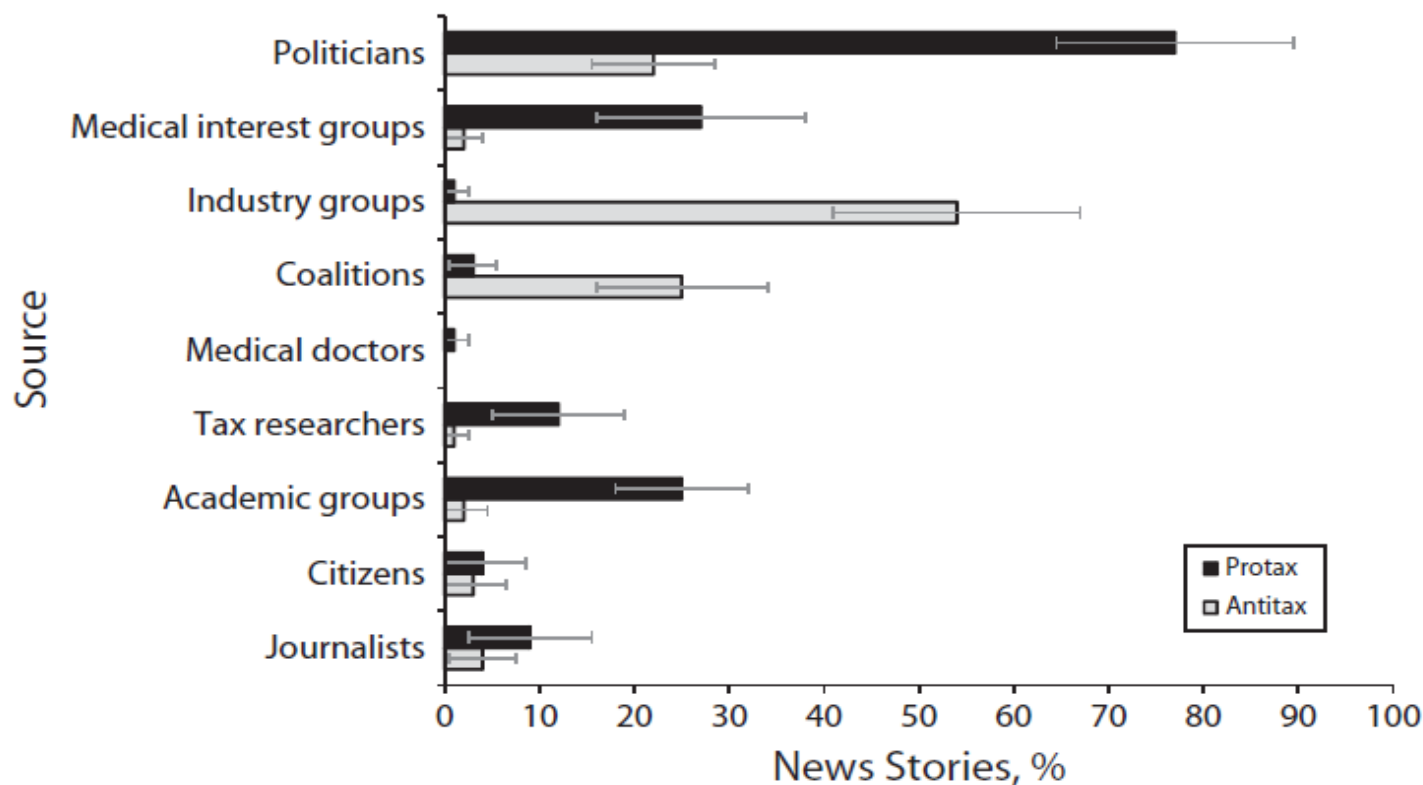
| Jeff Niederdeppe, PhD, Sarah E. Gollust, PhD, Marian P. Jarlenski, MPH, Ashley M. Nathanson, BA, and Colleen L. Barry, PhD, MPP

Objectives. We examined news coverage of public debates about large taxes on sugar-sweetened beverages (SSBs) to illuminate how the news media frames the debate and to inform future efforts to promote obesity-related public policy.

Methods. We conducted a quantitative content analysis in which we assessed how frequently 30 arguments supporting or opposing SSB taxes appeared in national news media and in news outlets serving jurisdictions where SSB taxes were proposed between January 2009 and June 2011.

Results. News coverage included more discrete protax than antitax arguments on average. Supportive arguments about the health consequences and financial benefits of SSB taxes appeared most often. The most frequent opposing arguments focused on how SSB taxes would hurt the economy and how they constituted inappropriate governmental intrusion.

Conclusions. News outlets that covered the debate on SSB taxes in their jurisdictions framed the issue in largely favorable ways. However, because these proposals have not gained passage, it is critical for SSB tax advocates to reach audiences not yet persuaded about the merits of this obesity prevention policy. (*Am J Public Health.* 2013;103:e92–e98. doi:10.2105/AJPH.2012.301023)



Note. Whiskers indicate 95% confidence interval.

FIGURE 1—Percentage of news stories using pro- and anti-sugar-sweetened tax sources: 2009–2011.

Opponents say:

Soft drink taxes are regressive. They will disproportionately hurt the poor and minorities who spend a larger proportion of their income on food.

The government should stay out of private behavior. It should not try to regulate what people eat or drink.

Soft drink taxes can't be compared to cigarette and alcohol taxes. The use of tobacco and alcohol can have adverse consequences (called "negative externalities") for non-users such as second hand smoke and drunk driving accidents. This is not true for soft drink consumption.

People who consume too many soft drinks know they risk becoming overweight. Everyone else shouldn't have to bear the burden of their bad decisions.

It's wrong to blame soft drinks for obesity because sales of "regular" soft drinks have decreased but obesity rates are still rising.

Proponents say:

■ **Obesity is a regressive disease. That is, it disproportionately affects poor and minority populations.**

■ **Soft drink taxes have the potential to be most beneficial to low income people, who:**

- may currently consume more soft drinks;
- may be more sensitive to higher prices and therefore stand to benefit most from reducing consumption.

This is especially true if the revenues are used for programs that will benefit the poor.

- While everyone must eat, sugared beverages are not a necessary part of the diet and generally deliver many calories with little or no nutrition.
- A no-cost alternative is readily available—water.
- It is generally agreed that while it is good public policy for the tax system as a whole to be progressive, it would not be good policy to expect that every single sales tax should be progressive.³¹

- The government is deeply involved in what we eat, from farm subsidies to setting nutritional standards for school meals. Major government interventions have been successful in improving and protecting the public's health. Examples include smoking restrictions and tobacco taxes, air bags in autos, fluoridated water, and vaccinations.
- Agriculture subsidies that support the production of high fructose corn syrup, and USDA policies on what can be sold in schools are examples of policies that may be counter-productive.
- Some states and cities have lower sales taxes on food than other products by virtue of food being a necessity. Policies could define sugared beverages as non-necessities so they would not qualify for lower rates.

Sugared beverage intake also results in externalities. Because of the relationship of soft drink intake to negative health outcomes in both children and adults, health care costs rise. Obesity-related medical expenditures are estimated to be \$147 billion per year. Half of these costs are paid for with taxpayer dollars through Medicaid and Medicare.³¹

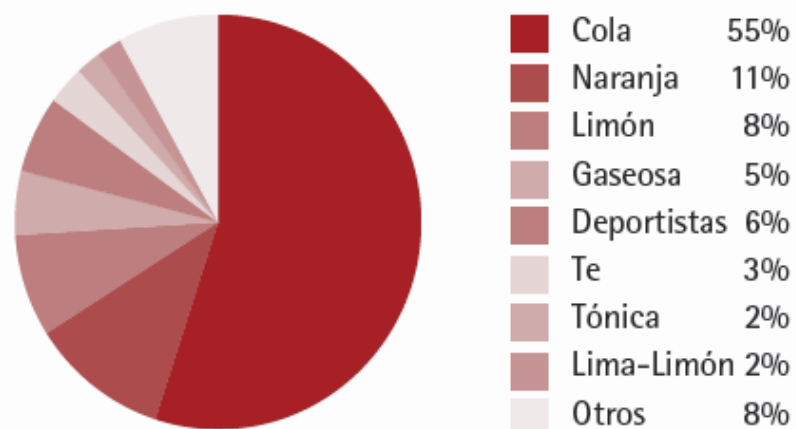
Consumers, especially young ones, may not know the risks involved in over-consumption of soft drinks or calories. For example:

- People may not be aware that a 20-ounce bottle of Coca Cola has more than 15 teaspoons of sugar and 240 calories.
- Most people cannot estimate the number of calories when they eat out. Even experienced nutritionists underestimate the numbers.
- Overweight and obese children are more likely to become obese adults and suffer from related chronic diseases.

The public may also not be aware that in 2006 manufacturers spent about \$1.62 billion to market soft drinks, snacks, and other unhealthy foods, just to children and adolescents and just in the U.S. Approximately \$870 million of that was spent on advertising to children under 12.³²

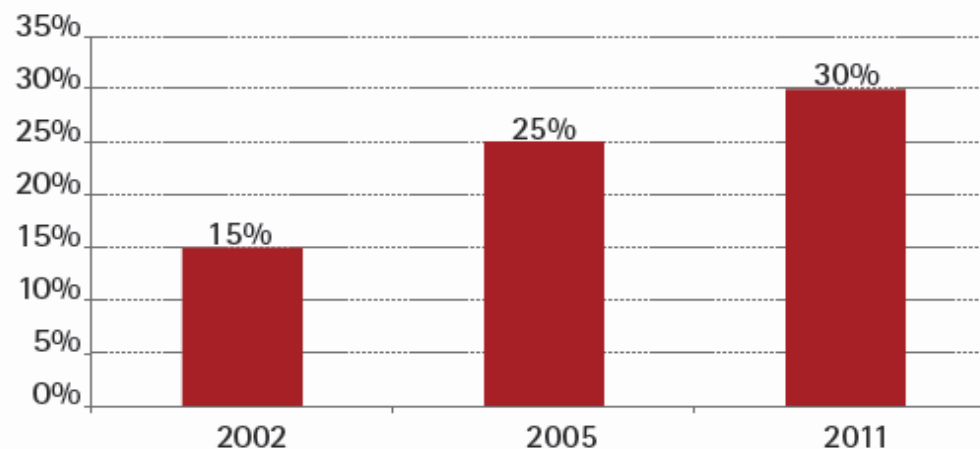
Sales of traditional carbonated sodas may be down, but sales of other sugared beverages have increased; hence the recommendation that all sugar-sweetened beverages be taxed.

Gráfico 1. Preferencias por sabores para los consumidores españoles. Año 2010



Fuente: Elaboración propia en base al Informe Socioeconómico ANFABRA (2010)

Gráfico 2. Evolución de los refrescos light. 2002 – 2011



Fuente: Elaboración propia en base al Informe Socioeconómico ANFABRA (2010)



High-Intensity Sweeteners and Energy Balance

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Recent epidemiological evidence points to a link between a variety of negative health outcomes (e.g. metabolic syndrome, diabetes and cardiovascular disease) and the consumption of both calorically sweetened beverages and beverages sweetened with high-intensity, non-caloric sweeteners. Research on the possibility that non-nutritive sweeteners promote food intake, body weight gain, and metabolic disorders has been hindered by the lack of a physiologically-relevant model that describes the mechanistic basis for these outcomes. We have suggested that based on Pavlovian conditioning principles, consumption of non-nutritive sweeteners could result in sweet tastes no longer serving as consistent predictors of nutritive postingestive consequences. This dissociation between the sweet taste cues and the caloric consequences could lead to a decrease in the ability of sweet tastes to evoke physiological responses that serve to regulate energy balance. Using a rodent model, we have found that intake of foods or fluids containing non-nutritive sweeteners was accompanied by increased food intake, body weight gain, accumulation of body fat, and weaker caloric compensation, compared to consumption of foods and fluids containing glucose. Our research also provided evidence consistent with the hypothesis that these effects of consuming saccharin may be associated with a decrement in the ability of sweet taste to evoke thermic responses, and perhaps other physiological, cephalic phase, reflexes that are thought to help maintain energy balance.

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**Bueno es saber que los vasos
nos sirven para beber;
lo malo es que no sabemos
para qué sirve la sed.**

