Sponsor Influence in Diabetes Research: An Industry Case Study

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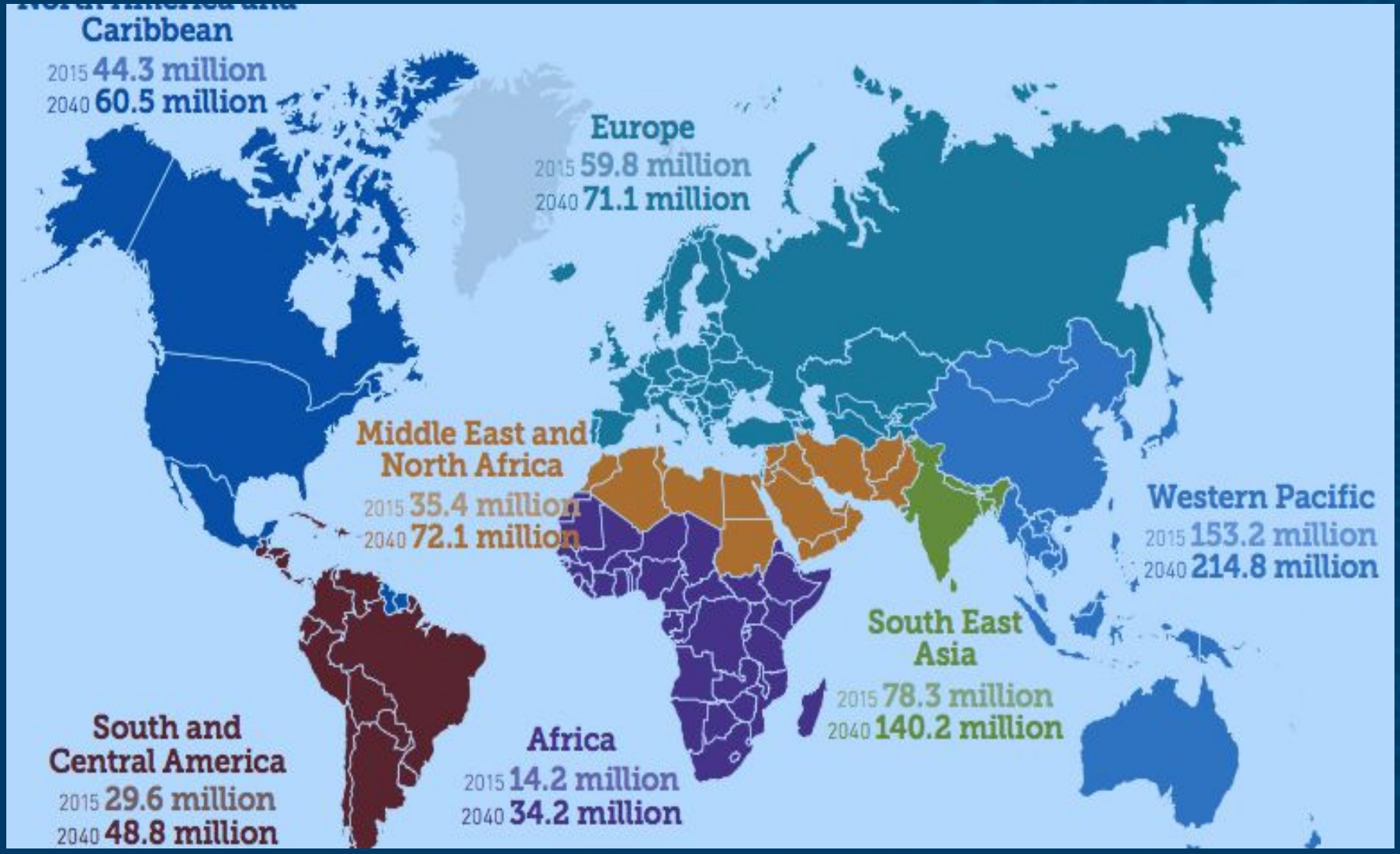
Prologue

Estimated Number of Adults with Diabetes

2015: 415M 2040: 642M



Global Burden of Diabetes by World Bank Income Level

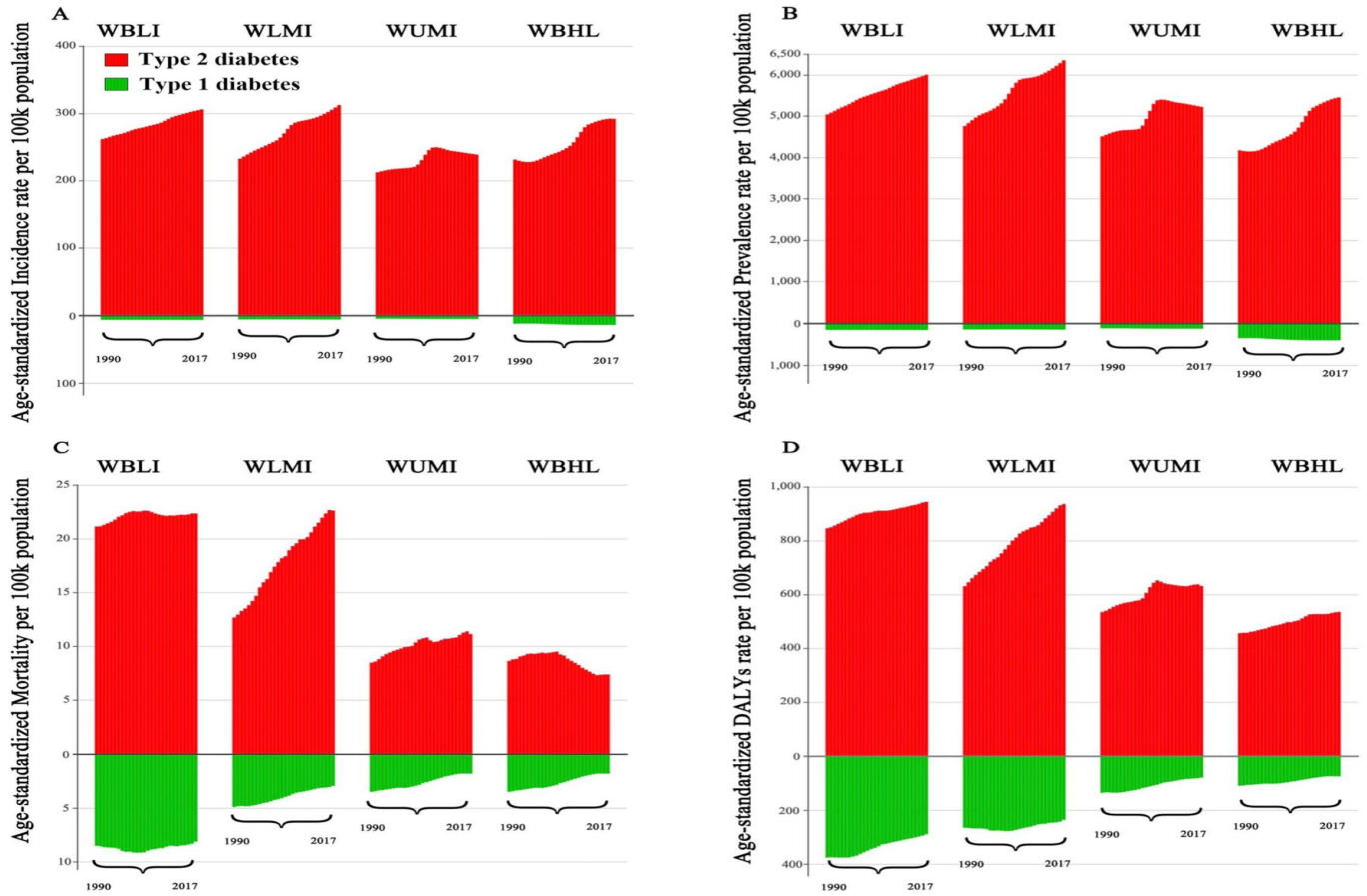
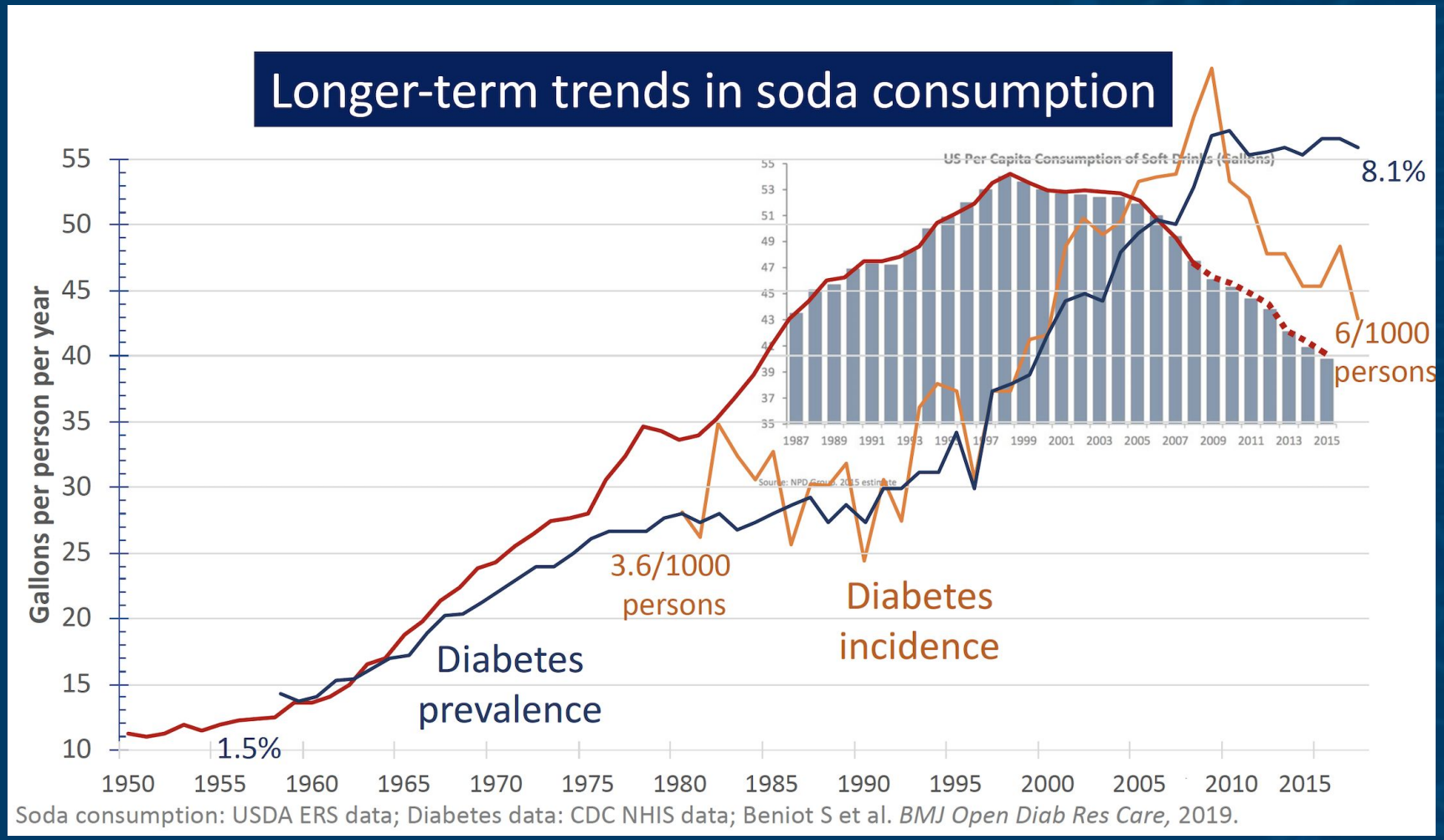


Figure 3. Global burden of diabetes mellitus in different World Bank Income Level regions from 1990 to 2017: (**A**) Age-standardized incidence rate, (**B**) Age-standardized prevalence rate, (**C**) Age-standardized mortality rate; (**D**) Age-standardized DALYs rate. WBLI: World Bank low income; WBLMI: World Bank lower middle income; WBUMI: World Bank upper middle income; WBHI: World Bank high income.

X Lin. Scientific Reports(2020) 10:14790 |

The Beginnings of a Public Health Turnaround?



Soda consumption: USDA ERS data; Diabetes data: CDC NHIS data; Beniot S et al. *BMJ Open Diab Res Care,* 2019.

Chapter 1: The Court Case

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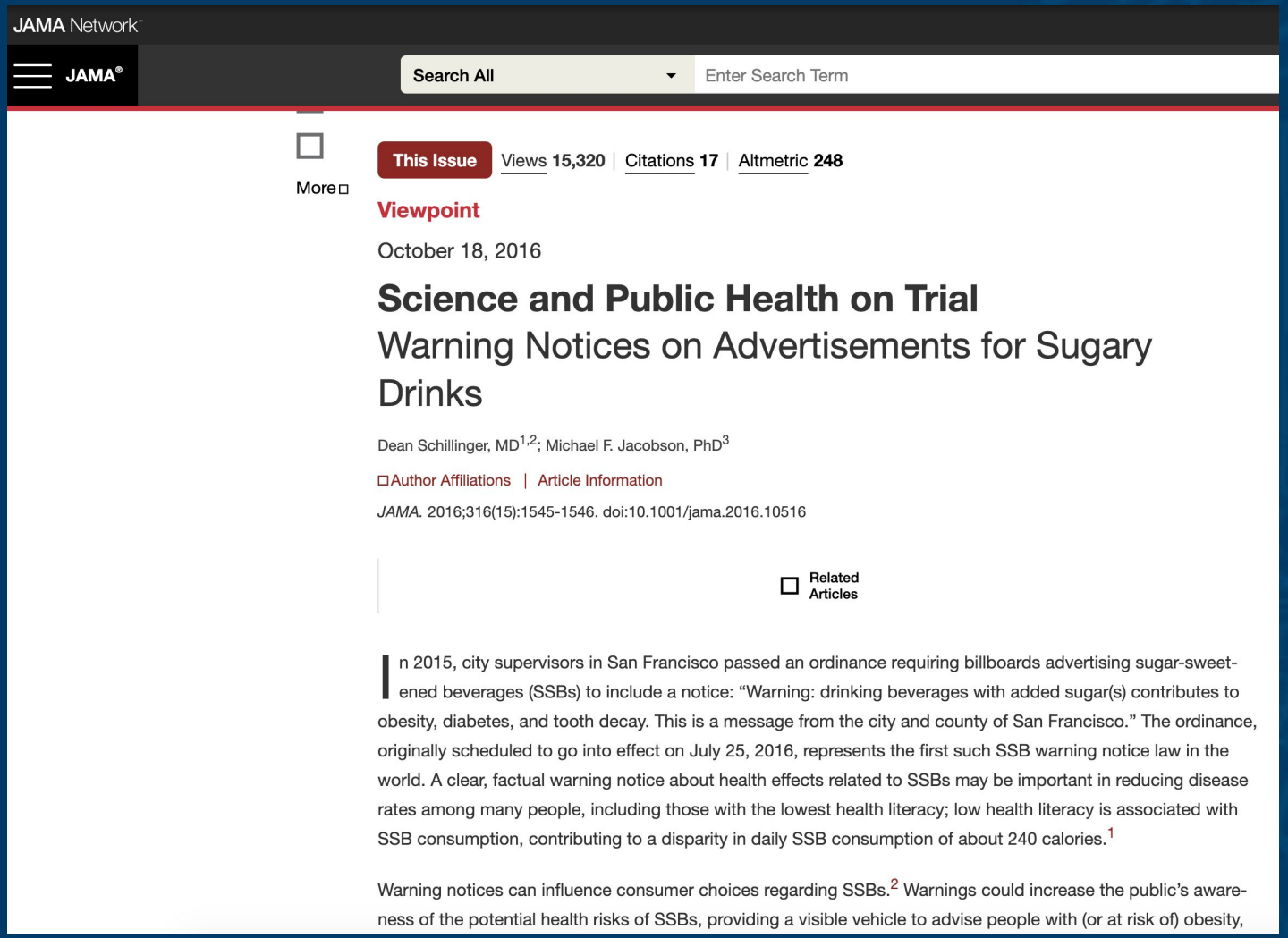
WARNING

Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay. This is a message from the City and County of San Francisco.

SCHOOL O NCISCO

American Beverage Association vs. The City and County of San Francisco



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Viewpoint

October 18, 2016

Science and Public Health on Trial
Warning Notices on Advertisements for Sugary Drinks

Dean Schillinger, MD[1,2]; Michael F. Jacobson, PhD[3]

Author Affiliations | Article Information

JAMA. 2016;316(15):1545-1546. doi:10.1001/jama.2016.10516

Related Articles

In 2015, city supervisors in San Francisco passed an ordinance requiring billboards advertising sugar-sweetened beverages (SSBs) to include a notice: "Warning: drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay. This is a message from the city and county of San Francisco." The ordinance, originally scheduled to go into effect on July 25, 2016, represents the first such SSB warning notice law in the world. A clear, factual warning notice about health effects related to SSBs may be important in reducing disease rates among many people, including those with the lowest health literacy; low health literacy is associated with SSB consumption, contributing to a disparity in daily SSB consumption of about 240 calories.[1]

Warning notices can influence consumer choices regarding SSBs.[2] Warnings could increase the public's awareness of the potential health risks of SSBs, providing a visible vehicle to advise people with (or at risk of) obesity,

- This case revolved around science and the nature of truth
- The scientific endeavor combines unbiased experimentation with objective observations of the natural world to accumulate knowledge so as to approximate truth.
- In the hearing and expert reports submitted by industry, the focus was on the scientific veracity of the warning.
- Industry argued that it is unconstitutional for commercial speech to be infringed or "chilled" by compelled, noncommercial speech (eg, a warning), particularly when the compelled speech is "misleading, false, or a subject of scientific controversy."
- *Industry cited scientific studies to support its claims of falsehood of the relationship between SSBs and disease and to animate it claims of controversy*
- The city responded that the warning is factually true and that causal relationships are supported by strong science.

- Judge Chen stated that “compelled disclosure must convey a fact rather than an opinion…generally speaking, it must be accurate.”
- He continued that the factual requirement should not “be so easily manipulated that it would effectively bar any compelled disclosure by the government, particularly where public health and safety are at issue.”
- He continued that “controversy cannot automatically be deemed created any time there is a disagreement about the science behind a warning because science is almost always debatable at some level.”
- He concluded that the SSB warning required by the ordinance likely passes the factual and accurate requirement.

Chapter 2: Competing Conflicts of Interest?

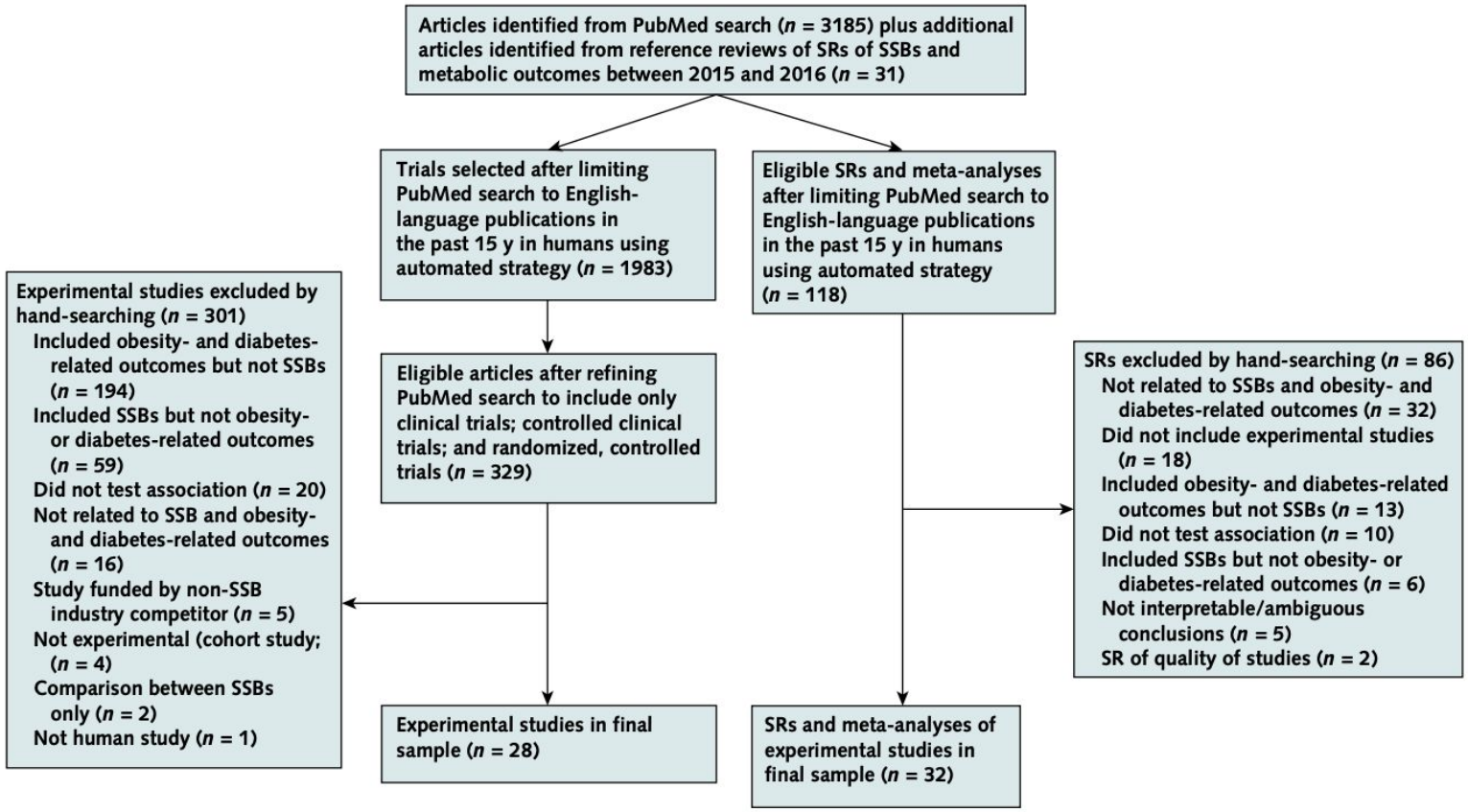
Annals of Internal Medicine®

Letters | December 20, 2016

Do Sugar-Sweetened Beverages Cause Obesity and Diabetes? Industry and the Manufacture of Scientific Controversy

Dean Schillinger, MD, Jessica Tran, BA, Christina Mangurian, MD, MS, Cristin Kearns, DDS, MBA

Figure. Study flow diagram.



Trials are presented on the left; SRs and meta-analyses are presented on the right. SR = systematic review; SSB = sugar-sweetened beverage.

Beverage Industry Heavily Influences Scientific "Truth"

- Identified 60 studies (28 trials and 32 systematic reviews/meta-analyses of trials) that examined effects of SSB consumption on obesity and diabetes outcomes
- 26 articles described no associations; 34 articles described positive associations
- 25 of 26 negative studies (96.2%) had funding ties to the industry
- 1 of 34 positive studies (2.9%) had ties
- Studies or study authors with evidence of funding by SSB industry more likely to find no associations than independently funded ones: RR 32.70 [4.70-225.8] P < 0.001
- This industry appears to be manipulating contemporary scientific processes to create controversy and advance their business interests at the expense of the public's health

Schillinger Ann Int Med 2016

Letter to the Editor: Maia Jack PhD Chief Science and Regulatory Officer American Beverage Association, Washington, DC

- "Schillinger…argued that research should be judged on its funding source, not its analytical rigor or scientific merit. Discrediting studies solely on the basis of funding source disserves scientific inquiry and casts unjustified judgments on the investigators producing them…"
- "Industry has an obligation to research its products' efficacy—typically through interventional studies—and safety. Dismissing industry-sponsored research on the basis of funding is no more valid than discarding studies funded by private foundations or groups that advocate for particular policy views. Transparent disclosure of financial conflicts of interest and of potential biases, as well as objective assessments of the research according to accepted scientific principles, is the proper approach to adequately vet the strengths of a study…"
- "The authors should ask themselves whether they are totally committed to their point of view and unwilling to consider other perspectives."
- *"Intellectually motivated biases are as important as financial conflicts of interest*."

Jack, Ann Int Med 2016

Intellectual Conflicts of Interest= Financial Conflicts of Interest

- This equivalence is dangerous and seems calculated to undermine the work of independent clinician–investigators whose primary obligation is the health of our patients and communities
- Brandt, Allan M. "Inventing conflicts of interest: a history of tobacco industry tactics." *American journal of public health* vol. 2011
- "Conflicts of interest—such as those invented by the tobacco industry—have the potential to undermine and corrupt the scientific enterprise in ways that do significant damage to what we know and how we deploy the knowledge we possess."

Chapter 3:
Junk Science and the Media

Annals of Internal Medicine®

Reviews | 21 February 2017

Conclusion:

Guidelines on dietary sugar do not meet criteria for trustworthy recommendations and are based on low-quality evidence. Public health officials (when promulgating these recommendations) and their public audience (when considering dietary behavior) should be aware of these limitations.

Primary Funding Source:

Technical Committee on Dietary Carbohydrates of the North American branch of the International Life Sciences Institute. (PROSPERO:

Annals of Internal Medicine®

Editorials | 21 February 2017

Guidelines to Limit Added Sugar Intake: Junk Science or Junk Food?

It is important to note that the North American branch of the International Life Sciences Institute (ILSI North America) funded the review. ILSI North America is a trade group representing The Coca-Cola Company; Dr Pepper Snapple Group; The Hershey Company; Mars, Inc.; Nestlé USA; and PepsiCo, among

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In summary, our concerns about the funding source and methods of the current review preclude us from accepting its conclusion that recommendations to limit added sugar consumption to less than 10% of calories are not trustworthy. Policymakers, when confronted with claims that sugar guidelines are based on "junk science," should consider whether "junk food" was the source.

The Junk Science in the ILSI-Funded Review (I)

- First, authors used the inconsistency of recommendations across guidelines as a rationale to raise concern about the quality of the guidelines
  - However, guidelines issued between 1995 and 2016; one would expect recommendations spanning more than 2 decades to evolve as scientific knowledge evolved. The most recent guidelines from Public Health England, the World Health Organization (WHO), and the U.S. Department of Agriculture show remarkable consistency, recommending limits ranging from less than 5% to less than 10% of daily calories from sugar intake.
  - The outlier was the 2002 Institute of Medicine guideline (25% of daily calories), which was partly funded by….ILSI North America

The Junk Science in the ILSI-Funded Review (II)

- Second (and quite paradoxically), the review considered the funding source to be a characteristic determining the trustworthiness of a guideline
  - They described as “unclear” the funding of the Dietary Guidelines for Americans (DGA) (which recommended limiting sugars to <10% of calories), questioning its editorial independence. This assessment is curious: The review's appendix acknowledges that the DGA is federally sponsored and that advisory committee members were thoroughly vetted for conflicts per federal rules.
  - Yet, the authors did not comment on the fact that the aforementioned IOM 25% sugar guideline was funded by ILSI.

The Junk Science in the ILSI-Funded Review (III)

- Third, use of the Appraisal of Guidelines for Research and Evaluation, 2nd edition (AGREE II) instrument to assess guideline quality guaranteed ratings of poor quality.
  - AGREE II designed for clinical practice guidelines in illness treatment
  - The objective of dietary guidelines is to assess risks of consumption at the population level, interventions to reduce consumption
  - Using this tool, the authors downgraded the trustworthiness of guidelines because ways to limit sugar intake “were not clearly presented” and because “likely barriers to and facilitators of implementation” were not discussed. They also created *de novo* an overall guideline quality score of 1 to 7, with interrater differences of 3 points permitted, yet did not report reliability of this score.

The Junk Science in the ILSI-Funded Review (IV)

- Fourth, authors' use of the GRADE system (Grading of Recommendations Assessment, Development and Evaluation) to evaluate quality of evidence for guidelines was problematic
- Authors falsely claimed that the food pattern modeling and national caloric data used to inform the US DGA are not publicly available, prohibiting them from applying GRADE to assess quality: "using the GRADE approach, we found that the overall quality of evidence to support recommendations was low to very low."
- They ignored that the methods used to assess dietary patterns in DGA are described in detail in Appendix E-3.7, together with a 500-page supporting report, "A Series of Systematic Reviews on the Relationship Between Dietary Patterns and Health Outcomes" (7), from USDA's Nutrition Evidence Library

The Atlantic

HEALTH

The Limits of Sugar Guidelines

Is there a danger in governments offering too-specific advice on sugar consumption?

By Nina Teicholz

Sugary drinks on display in New York City in 2012, at a news conference about a proposed ban on all soft drinks over 16 ounces in the city's restaurants and stores (Andrew Burton / Reuters)

The Atlantic

Industry manipulation of the science is obviously an ongoing, concern. It was, in part, why the editor-in-chief of *Annals*, Ch invited this editorial. "I wanted to show both sides of the issu although she said that she considered the editorial to be unusu and hostile" for an academic journal. Indeed, Schillinger and part-time advocates against sugar; they write articles and do o *Sugar Science*, a group devoted to educating the public about dangers. "It's shown me that conflicts of interest are not only intellectual," said Laine, who added disclosures about the auth *Science* affiliations to the editorial after a reader brought them she says.

What is SugarScience?

SugarScience.ucsf.edu is designed as an authoritative source for the scientific evidence about sugar and its impact on health. Developed by a team of health scientists from the University of California, San Francisco (UCSF), the site reflects an exhaustive review of more than 8,000 scientific papers that have been published to date, with a focus on the areas where the science is strongest – specifically, on diabetes, heart disease and liver disease. The goal of SugarScience is to take this information out of medical journals and make it available to the public, to help individuals and communities make healthy choices.

SugarScience enables you to:

- Explore the latest, evidence-based research on the health effects of sugar overconsumption;
- Ask the SugarScientists questions to clear up confusion or learn more about sugar's impact on our health;
- Download flyers, posters or graphics from the SugarScience Resource Kit to post on your refrigerator, share with friends or family, or use in presentations to your community and schools;
- Stay connected through our newsletter, SugarScience Alerts, featuring new science and expert perspectives, and follow us on social media.

Team of Experts

The SugarScience Team includes prominent, uniquely qualified scientists from a wide spectrum of medical research specialties in some of the nation's top universities, including UCSF, UC Davis and Emory University. They are unified by a commitment to sharing the latest research on sugar and its impact on health in a clear and transparent way. Information presented on SugarScience.ucsf.edu undergoes a rigorous review process that includes in-depth reviews of scientific studies and careful vetting for accuracy. In areas where the science is still under debate or frequently miscommunicated, the SugarScience team also offers its insights in dispelling myths, to enable individuals to make more informed decisions.

Mission to Improve Health

SugarScience is supported by the Clinical and Translational Science Institute and the Philip R. Lee Institute for Health Policy Studies at UCSF, the leading university exclusively focused on health.

With an overarching and ambitious public mission of "advancing health worldwide," UCSF has a 150-year history of serving the public across the health spectrum, from advancing our understanding of fundamental biological and health sciences, to providing some of the nation's best care in UCSF Medical Center and UCSF Benioff Children's Hospital San Francisco. The university is driven by the idea that when the best research, the best education and the best patient care converge, great breakthroughs are achieved.

Conclusions/Questions

- Industry has a track record of unfavorably influencing science in multiple, insidious ways
- The beverage industry has demonstrated its ability to manipulate the scientific process and shape what is considered to be scientific "fact" or scientifically "controversial"
- Scientific – and the policymaking – communities must continue to be vigilant, in defense of the pursuit of truth, about the effects of financial COIs
- Should journals require not only COI disclosures, but also require critical reviews by experts in COI?
- Should editors' performance be assessed with respect to their track record around COI?
- How can we prevent the construct of so-called "intellectual conflicts of interest" from being used to undermine public health?
- When is it appropriate for journals to take a stance against publishing science funded by industries with an established track record of manipulating the scientific process to promote their bottom lines while they undermine public health?*
- How can we educate the media about the potential effects of COIs on science while also promoting public trust in science?

Briggs et al. Am J Pub Health 2022