An All-of-Government Approach to Diabetes Prevention & Control
Recommendations of the Congressional Diabetes Commission

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Disclosures

- Dr. Schillinger served as a volunteer co-chair of National Clinical Care Commission (NCCC)
- NCCC chartered by US Congress; funded by Office of the Assistant Secretary for Health and Human Services
- Funders had no role in the preparation, review, or approval of presentation
- Presentation does not represent the official views of NCCC, HHS or federal government
- NCCC Report completed on 9/30/21 and was submitted to Congress on Jan 6 2022

The Last National Commission on Diabetes

- The *Long-Range Plan to Combat Diabetes*, 1974
- Viewed diabetes as a biomedical problem that required biomedical solutions

Major Accomplishments of the 1974 National Commission on Diabetes

- NIH
  - The Diabetes Control and Complications Trial
  - The Diabetic Retinopathy Study
  - Diabetes Research and Training Centers
  - National Diabetes Data Group
  - National Diabetes Information Clearinghouse
  - Diabetes Mellitus Interagency Coordinating Committee
- CDC
  - Diabetes Control Programs
- VA and IHS
  - Model care diabetes programs

New National Clinical Care Commission

- Federal Advisory Committee established by Public Law 115-80, 2017 (Senators Shaheen [D-NH], Murray [D-WA], Collins [R-ME])
- In 2018, the Commission was convened by the Secretary of Health and Human Services to evaluate and make recommendations regarding improvements to coordination and leveraging of programs within the Department of Health and Human Services and other Federal agencies related to awareness, prevention, and clinical care for diabetes

Description of Duties

The Commission shall evaluate and make recommendations to the Secretary and Congress regarding:

1. Federal programs of the Department of Health and Human Services that focus on preventing and reducing the incidence of diabetes
2. Current activities and gaps in Federal efforts to support clinicians in providing integrated, high-quality care to individuals with the diseases and complications
3. The improvement in, and improved coordination of Federal education and awareness activities related to the prevention and treatment of the diseases and complications, which may include the utilization of new and existing technologies

Description of Duties

4. Methods for outreach and dissemination of education and awareness materials that
   a) Address the diseases and complications
   b) Are funded by the Federal Government
   c) Are intended for health care professionals and the public
5. Whether there are opportunities for consolidation of inappropriately overlapping or duplicative Federal programs related to the diseases and complications.

Information Gathering and Assessment

The NCCC collected information on federal policies and programs relevant to diabetes through:

- Data call
- Literature searches
- Key informant and stakeholder discussions
- Public comment

Health-Related Federal Agencies

- Agency for Healthcare Research and Quality
- Centers for Disease Control and Prevention
- Centers for Medicare & Medicaid Services
- Department of Veterans Affairs
- Food and Drug Administration
- Health Resources and Services Administration
- Indian Health Service
- National Institutes of Health
- Office of Minority Health

Non-Health-Related Federal Agencies

- Department of Agriculture
- Department of Defense
- Department of Education
- Department of Housing and Urban Development
- Department of Labor
- Department of Transportation
- Department of Treasury
- Environmental Protection Agency
- Federal Bureau of Prisons
- Federal Communications Commission
- Federal Trade Commission

Work Process

- Met from October 2018 through September 2021
- 12 Public Meetings
- Numerous subcommittee meetings
- Meetings with key informants and stakeholders
- Report completed on September 29, 2021
- Report transmitted to Congress on January 6, 2022

NCCC Subcommittee Focus Areas

- Preventing and controlling diabetes through population-level policies
- Preventing type 2 diabetes in targeted populations at high risk
- Treating and managing diabetes and its complications to improve the health outcomes of individuals with diabetes

The National Clinical Care Commission Recommendations

Population-Level Diabetes Prevention and Control

Need for a New Perspective

- Historically, clinical care for prediabetes and diabetes involved combination of lifestyle counseling, patient self-management education, and therapeutics (medications)
- However, majority of Americans with prediabetes and diabetes have inadequate resources and/or live in unsupportive environments with respect to diabetes
- This has undermined clinicians' ability to prevent and manage diabetes
- Many clinicians report frustration and clinical "burnout" when working in settings that do not account for diabetes patients' social, material, and psychological needs
- Standard for high-quality, diabetes clinical care has evolved; now involves comprehensive approach that includes robust clinic-community linkages
- Involve referrals to programs, many of which are funded and/or directed by federal agencies, that offer basic goods and services.
- Examples include programs that provide assistance with nutrition, housing, and transportation, etc.

Need for a New Perspective

- NCCC determined that it is critical to assess how federal programs that influence the social and environmental conditions can be designed, leveraged, and coordinated to enable such an integrated model of care to achieve its objectives
- Doing so will not only better support clinicians caring for individuals at risk for or with diabetes, but also will increase the return on investment of federal expenditures, by ensuring that the design of non-health-related federal programs (for example, the Supplemental Nutrition Assistance Program [SNAP], a USDA program) can enhance, rather than undermine, the efficacy of federal healthcare programs (for example, Medicare and Medicaid, HHS programs)
- Many of the recommendations made by the National Clinical Care Commission Prevention in the General Population Subcommittee are intended to ensure that clinicians can provide high-quality, integrated care, and that their patients can successfully prevent or self-manage diabetes

Need for an ALL-OF-GOVERNMENT Approach

- While some nations affirmatively address diabetes through trans-sectoral governmental activities, to date, the U.S. has not
- What little work has been done to facilitate trans-agency action around diabetes has been of a pilot nature and has lacked scale
- The U.S. lacks adequate structures, policies, and practices to coordinate strategic planning across health and non-health agencies
- Untapped opportunity to leverage efforts of federal agencies and increase coordination to achieve outcomes called for in NCCC charter

"Diabetes is not simply a health condition that requires medical care but also is a societal problem that requires a trans-sectoral, all-government approach to prevention and treatment"

Trans-Sector Engagement

- For nearly a year, NCCC grappled over question of commission's scope
- Ultimately agreed to assess policies and programs of non-health-related federal agencies that impact food, housing, workplace, and built and ambient environments that affect social and environmental conditions at root of type 2 diabetes, complications, and associated health disparities
- NCCC developed novel framework that combined elements of socioecological and chronic care models to guide recommendations, all through health equity lens
- Developed 13 trans-sector recommendations

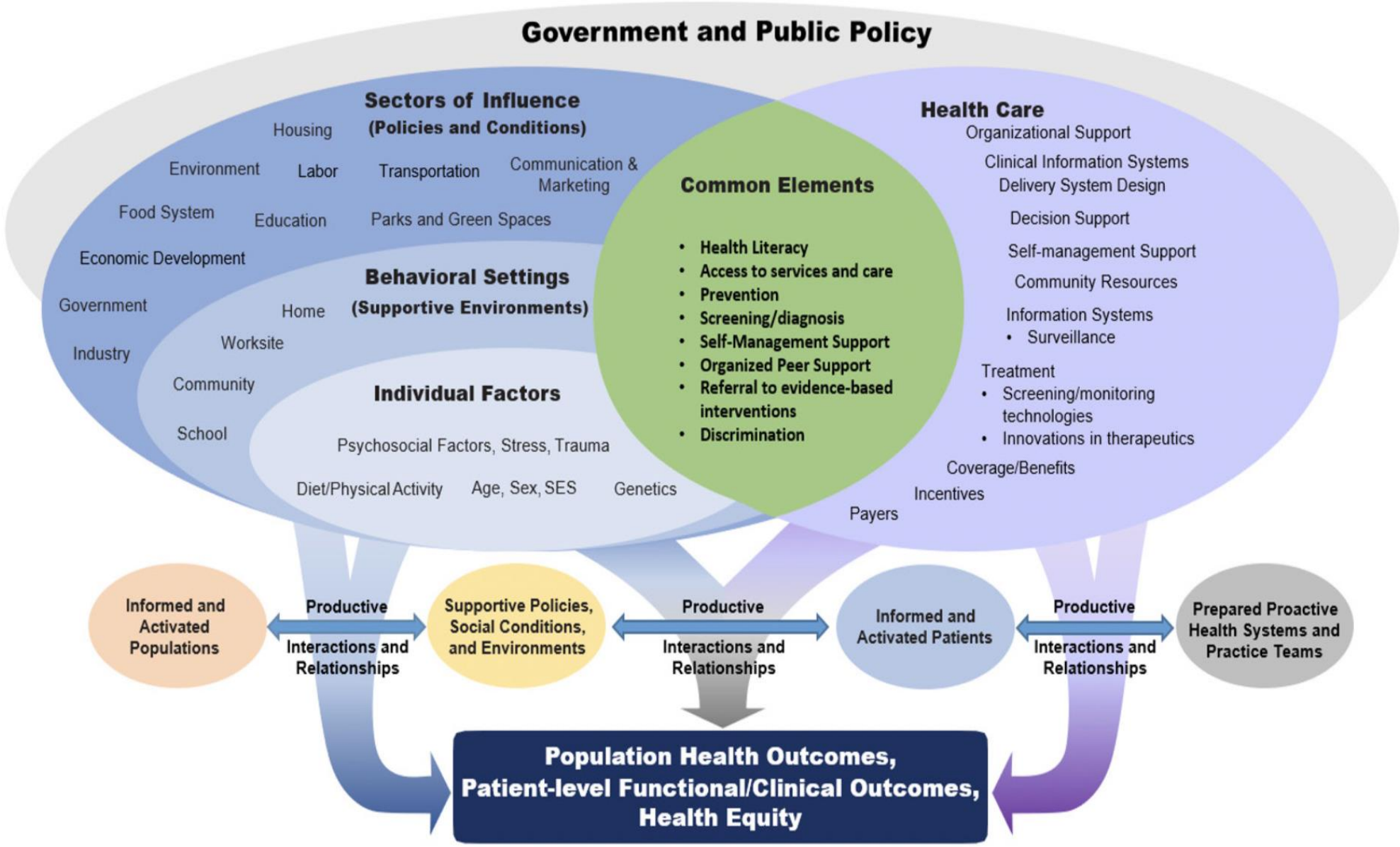
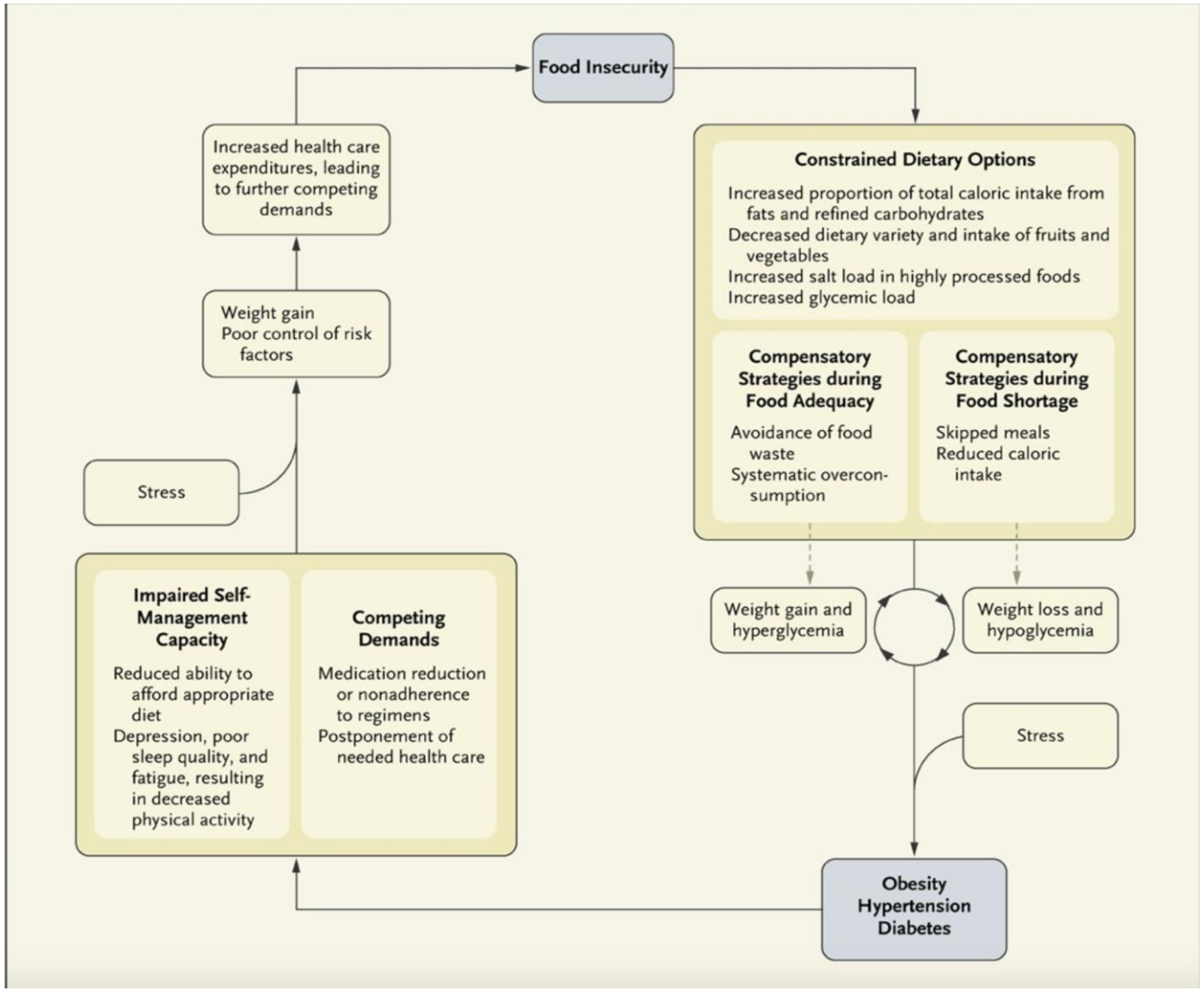


Figure 2. The National Clinical Care Commission Framework for Diabetes Prevention and Control: The Combined Socioecological and Chronic Care Model for Diabetes

Cycle of Food Insecurity & Diabetes



Seligman, Schillinger NEJM 2009

USDA Supplemental Nutrition Assistance Program

Provides ~$80 billion to supplement food budget of income-eligible individuals, households (~40M people/yr)

Valuable for reducing food insecurity; impacts on diet and diabetes not optimized

In one year alone, >$4 billion of SNAP budget used by beneficiaries to purchase SSBs; ~$600 million on federal chronic disease prevention and control

USDA

NCCC recommends that SNAP be enhanced to reduce food insecurity and improve nutrition sufficiency by:

- regularly assessing and increasing SNAP benefit allotments,
- providing incentives for the purchase of fruits and vegetables,
- eliminating SSBs as an allowable SNAP purchase,
- expanding SNAP enrollment and educational programs

USDA

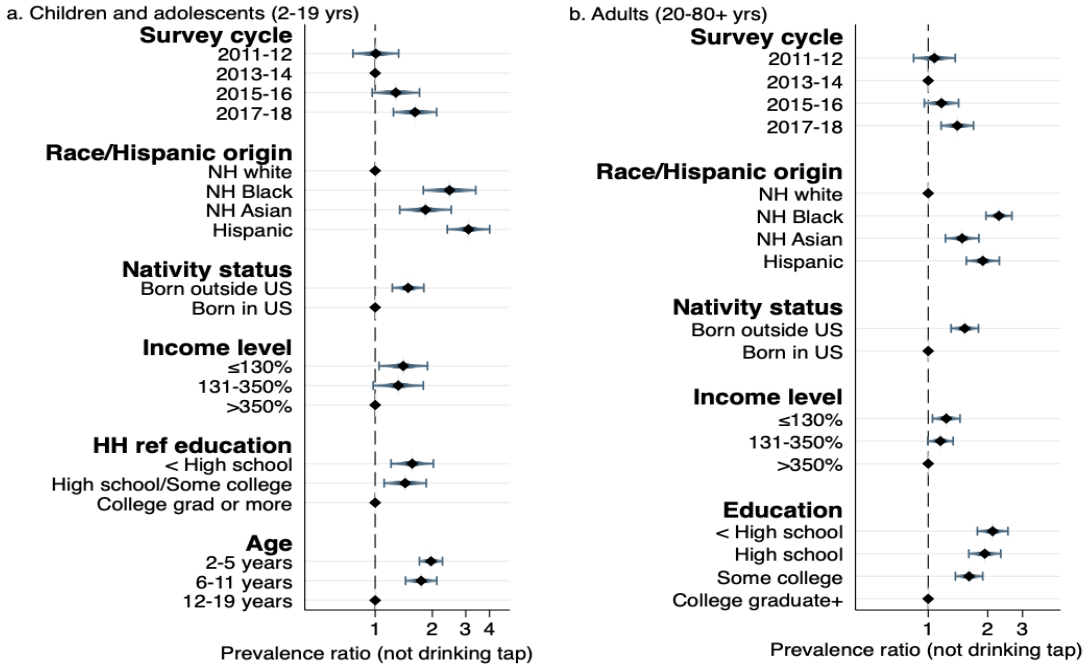
Harness $20 billion School Lunch and Breakfast Programs and $5 billion WIC program to improve dietary quality

USDA

- Enhance WIC program; expand summer nutrition program and fresh fruit and veggie program for school-age children
- Collaborate with Depts of Ed, Interior and EPA to ensure that all students in public schools have reliable access to safe, appealing, free drinking water, prohibit sale of calorically dense and nutrient-poor foods, including SSBs
- Add drinking water to *MyPlate* graphic and associated content; WIC should promote water consumption
- USDA should be provided with additional resources to promote the sustainable production, supply, and accessibility of "specialty crops" (fresh fruits, dried fruits, vegetables, and tree nuts)*
  - *currently 0.1% of Farm Bill

~50% US kids and adults do not drink tap water

Figure 1: Log-binomial regression models of not drinking tap water by survey cycle, race/ethnicity, and socio-demographics, NHANES 2011-2018 among (a) children/adolescents and (b) adults.



Notes: n=9,439 children/adolescents aged 2-19; n=17,268 adults; models adjusted for all variables shown in addition to sex, and age (for adults). Full models shown in Supplemental Table 1.

Rosinger, Patel et al. BMJ 2021

Fresh water access in public schools is inadequate

Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Drinking water access in California schools: Room for improvement following implementation of school water policies

Emily A. Altman[a,b], Kevin L. Lee[c,d], Christina A. Hecht[e], Karla E. Hampton[f], Gala Moreno[a,g], Anisha I. Patel[a,h,*]

Water Over SSBs

NCCC recommends that all relevant federal agencies promote the consumption of water and reduce consumption of SSBs in the U.S. population, and that they employ all the necessary tools to achieve these goals, including education, communication, accessibility, water infrastructure, and SSB taxation

ORIGINAL CONTRIBUTION

Association of Health Literacy With Diabetes Outcomes

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John Piette, PhD
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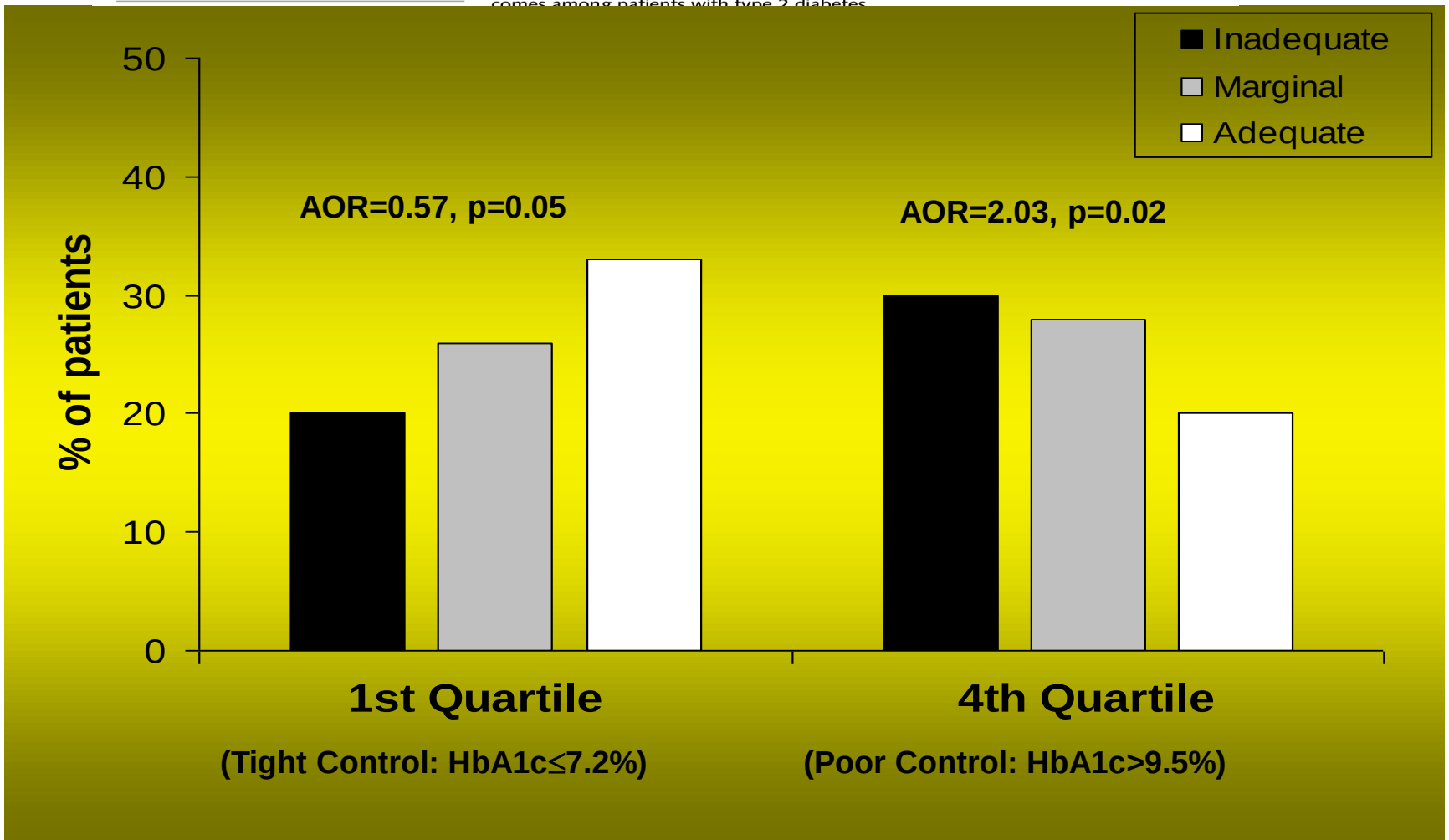
Context Health literacy is a measure of patients' ability to read, comprehend, and act on medical instructions. Poor health literacy is common among racial and ethnic minorities, elderly persons, and patients with chronic conditions, particularly in public-sector settings. Little is known about the extent to which health literacy affects clinical health outcomes.

Objectives To examine the association between health literacy and diabetes out-comes among patients with type 2 diabetes



Lower health literacy independently associated diabetes complications

Complication	Adjusted odds	95% CI
Retinopathy	**2.33**	(1.19-4.57)
Nephropathy	1.71	(0.75-3.90)
Lower Extremity Amputation	2.48	(0.74-8.34)
Cerebrovascular Disease	**2.71**	(1.06-6.97)
Ischemic Heart Disease	1.73	(0.83-3.60)

Health Literacy and SSBs

- Strongest independent risk factor of SSB consumption
- (▲ 240 kcal/day more: one 16-oz bottle, 12 teaspoons = 48 gm sugar)*

*exceeds the TOTAL max daily amount of added sugar based on US Dietary Guidelines (9 teaspoons/day for men; 6/day for women)

Zoellner, *J Am Diet Assoc* 2011

Public often misinformed about nutritional value and health risk of foods/bevs

Current labeling regulations inadequate to identify risk and allow individuals to reduce consumption of foods/bev's

Inaccurate marketing claims about health benefits of products pose challenges for many consumers when it comes to protecting their own and families' health

FDA should

- implement easily recognizable, understandable, compulsory front-of-package icon system to identify health attributes and risks of foods/bev's based on ingredients
- improve Nutrition Facts Label to enable consumers to interpret added sugar content
- update its policies and regulations to prevent industry claims that mislead U.S. consumers to believe that unhealthy foods are healthy

What About Industry Marketing?

FTC

FTC should be provided with authority, mandate, and requisite resources to create rules regarding marketing and advertising of foods and beverages to children <13 years, monitor associated industry practices, and enforce such rules

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

Author, Article and Disclosure Information

https://doi-org.ucsf.idm.oclc.org/10.7326/L16-0534

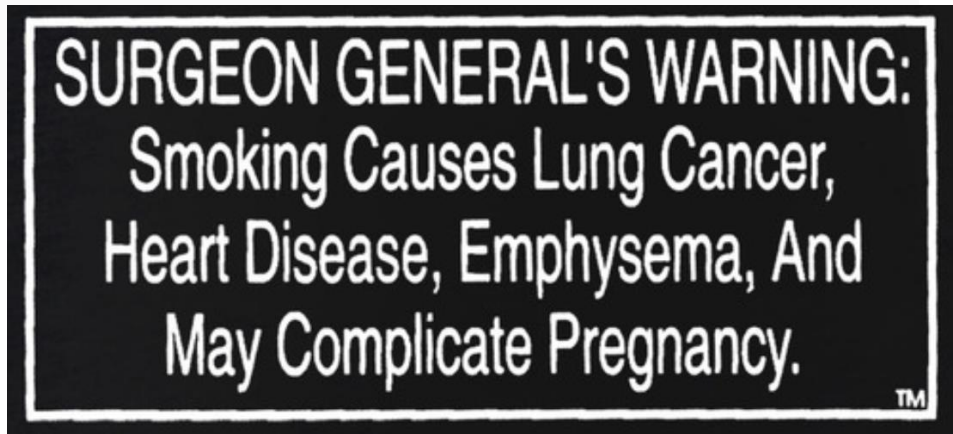
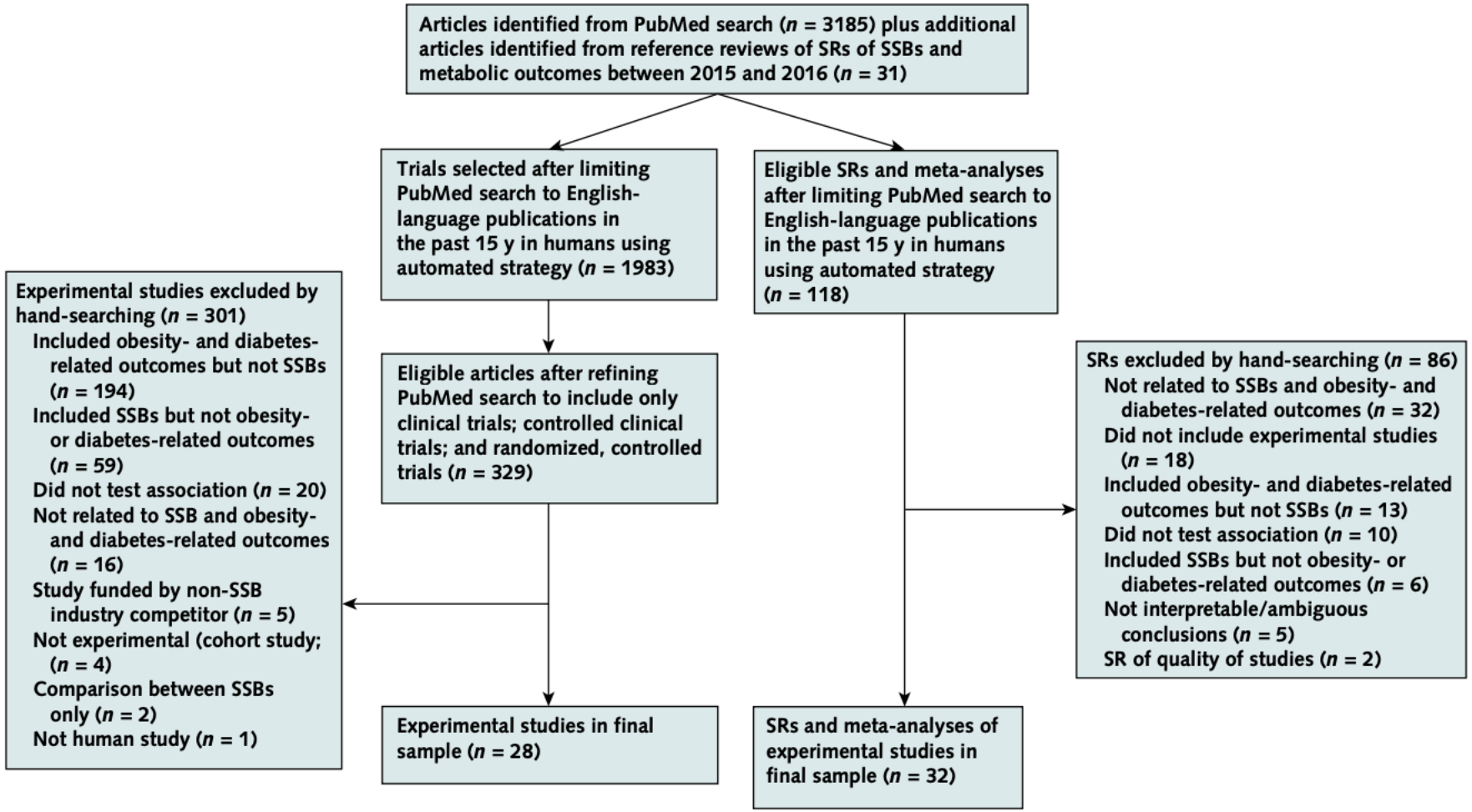


Figure. Study flow diagram.



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

SSBs represent largest source of added sugar in average diets and comprise 50-90% of recommended daily limit of added sugars

In U.S., SSB consumption alone projected to account for 1.8 million new cases of diabetes over 10 years

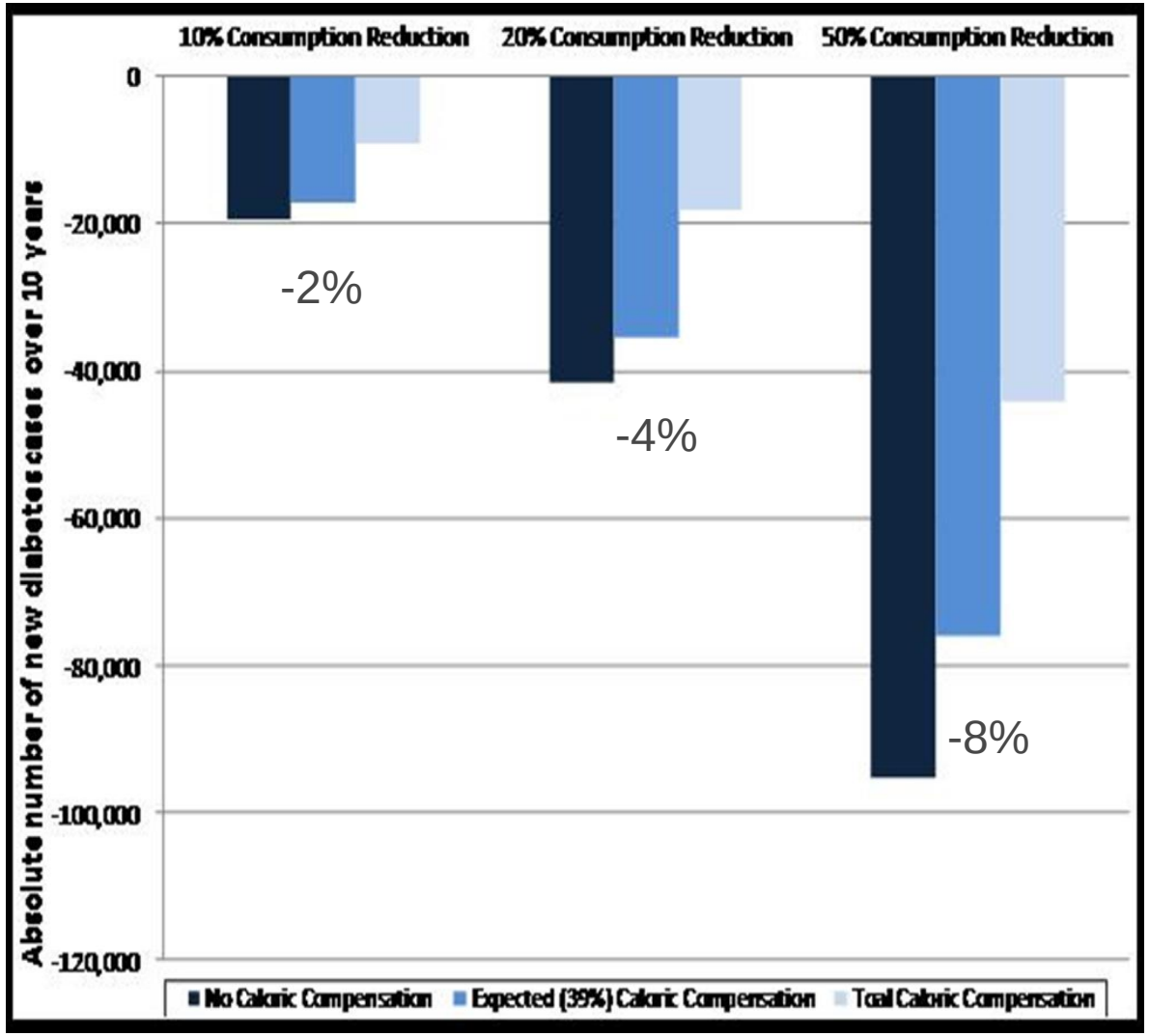
Percent of cases attributable to SSBs much higher in low-income and communities of color; significant contributor to disparities

The U.S. government has not issued scientific reports or clear guidance to the public about the health hazards of SSBs

HHS

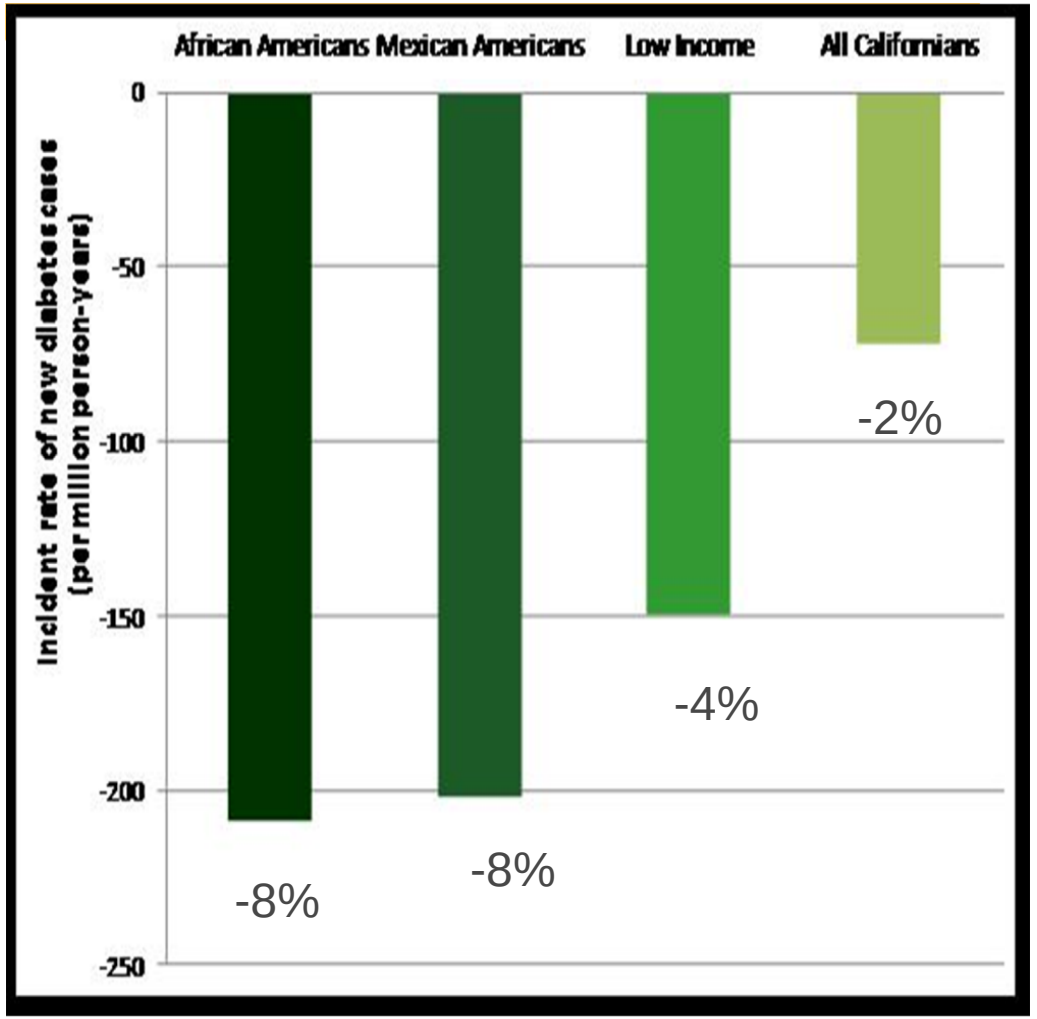
The US Surgeon General should issue a scientific report that synthesizes the evidence linking sugar-sweetened beverage consumption with type 2 diabetes, and widely disseminate its results. This synthesis should be free from industry conflicts

What if US consumed fewer SSBs?
10-year projection on diabetes incidence



Mekonnen, Bibbins-Domingo PLOS One 2013

New cases of diabetes would drop more in those most affected by T2D (assumes 10% reduction, 39% caloric compensation)

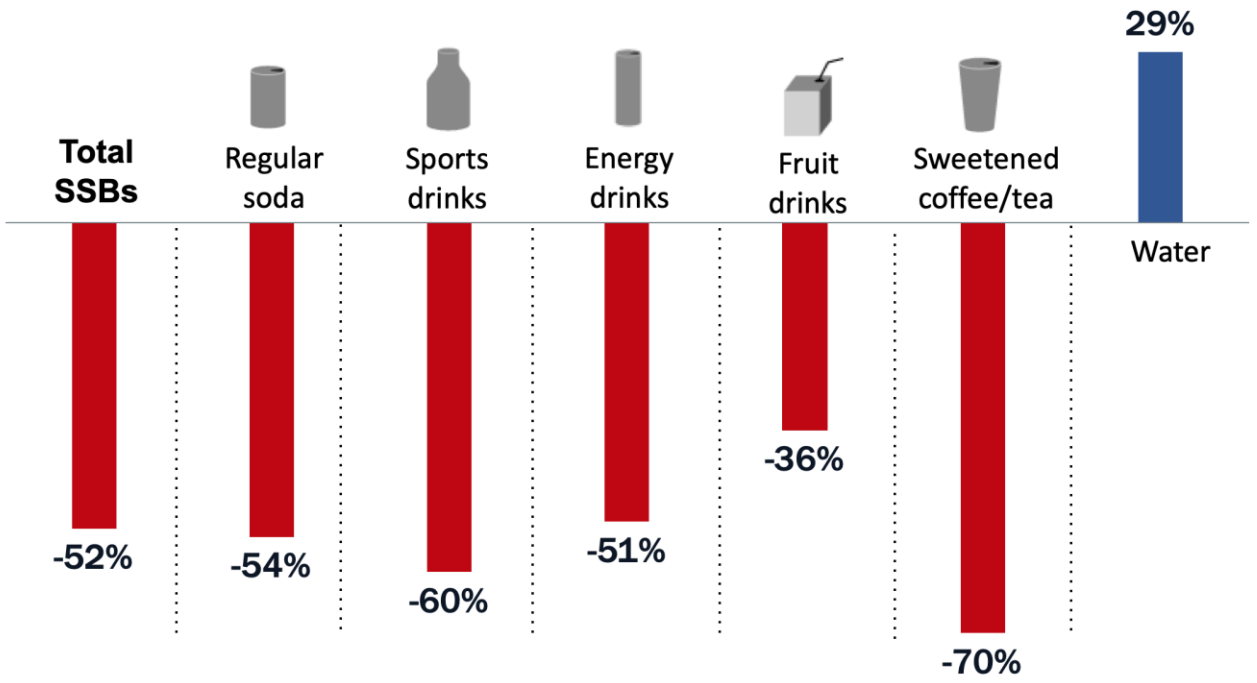


Sugar-Sweetened Beverage Consumption 3 Years After the Berkeley, California, Sugar-Sweetened Beverage Tax

Matthew M. Lee, BA, Jennifer Falbe, ScD, MPH, Dean Schillinger, MD, Sanjay Basu, MD, PhD, Charles E. McCulloch, PhD, and Kristine A. Madsen, MD, MPH

4. Consumption of SSBs declines relative to control cities

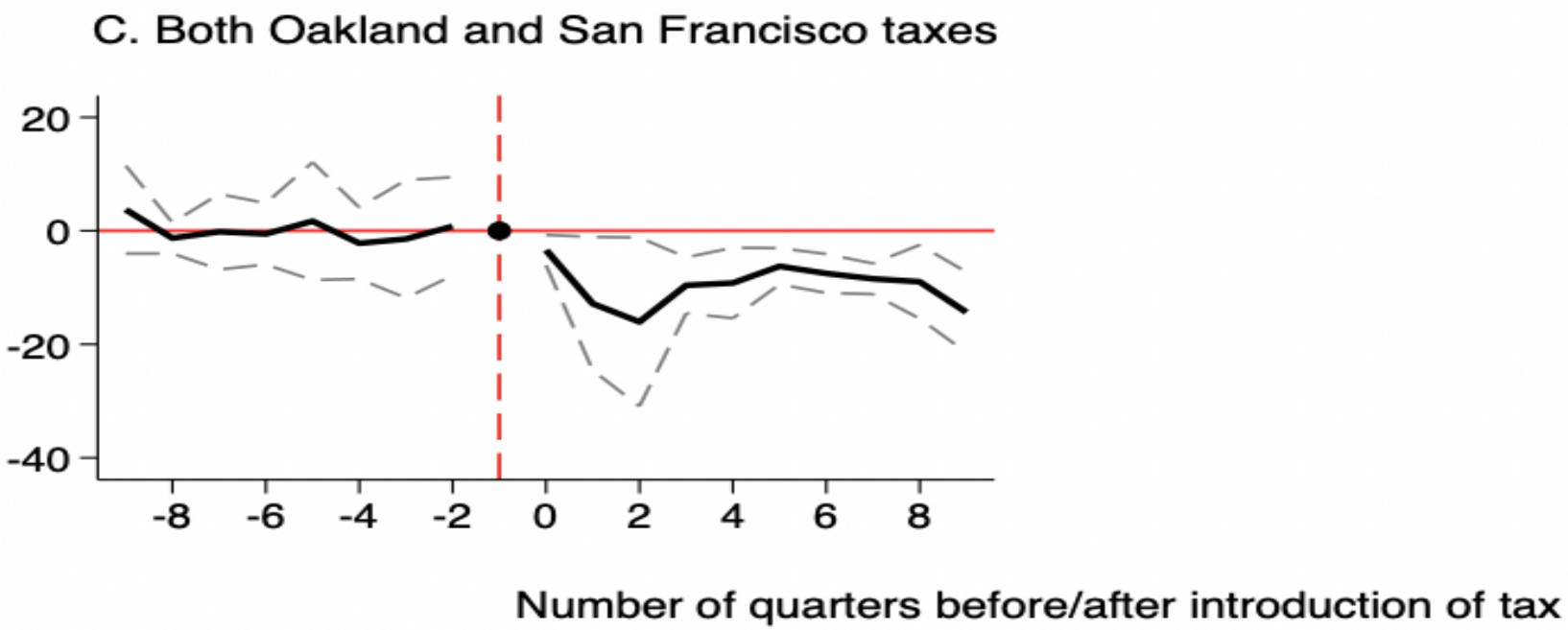
Changes in consumption over first 3 years of Berkeley's tax)



Lee et al. *AJPH*, 2019.

R01DK116852 (Schillinger)

Time-Varying Effects of SSB Tax on SSB Purchases in Oakland and SF Relative to Comparator City



~24-30% reduction in volume purchased

J White et al. in review
R01DK116852 (Schillinger)

Regressive vs Progressive Tax?

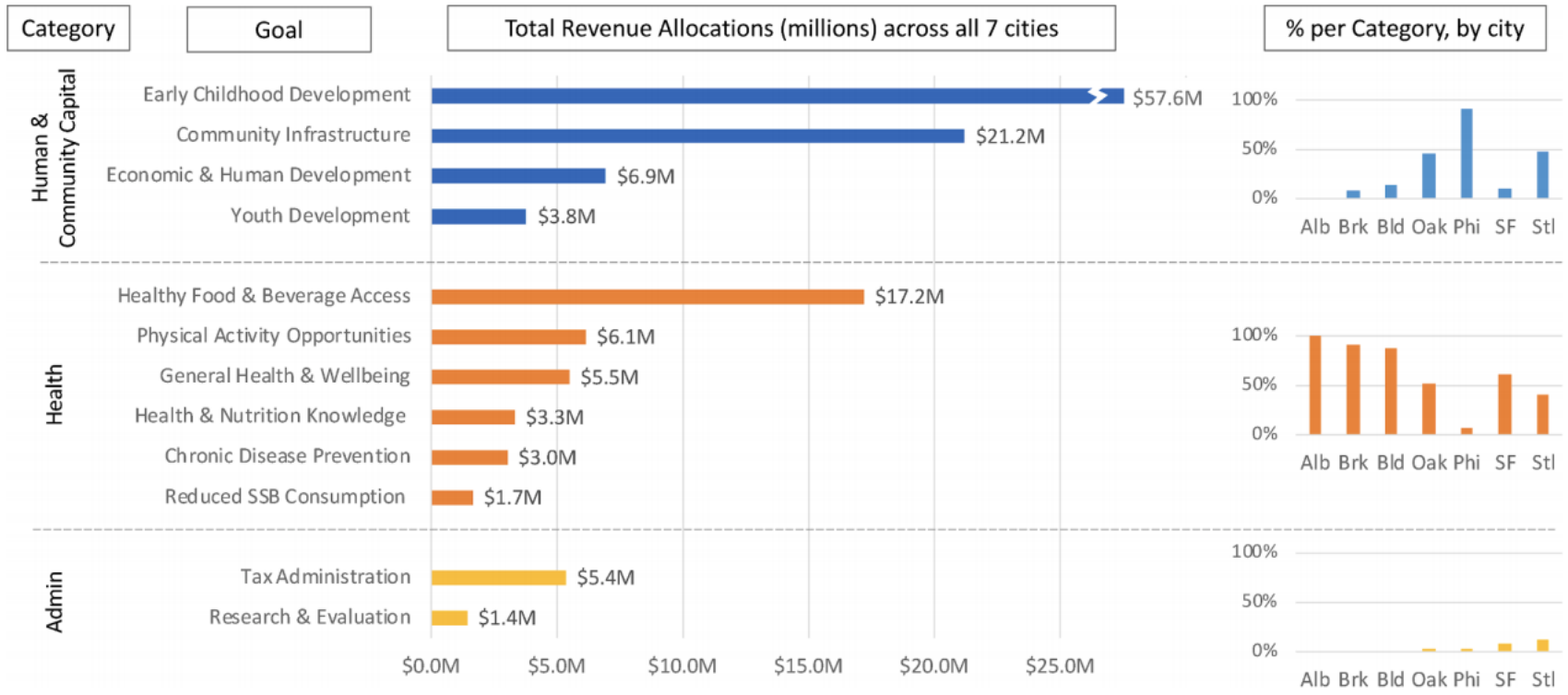


Fig. 1. Total SSB tax revenue allocations by goal category, overall and by city. Dollar amounts represent SSB tax revenue allocations for: 2018 for Seattle; 2019 for Boulder; fiscal year 2019–2020 for Albany, Oakland and San Francisco; and fiscal year 2020–2021 for Berkeley and Philadelphia. In San Francisco, revenue allocations exclude $3.36 M, 22% of total tax revenues that must support preexisting voter-mandated budget obligations.

$133M (~5% on tax admin/evaluation)

Increasing SSB price with excise taxes of ~1c/ounce reduces consumption by ~25% and raises significant revenue to fund health promotion

Such reductions will reduce the incidence of diabetes, especially among children, low-income individuals, and people of color

Such reductions can also delay or prevent the development of diabetes complications and are cost saving to society

Department of Treasury

- The Treasury Department should impose an excise tax on SSBs to cause at least a 10% increase in their shelf price and the revenues should be invested in diabetes prevention and control in those communities that bear a disproportionate burden of type 2 diabetes. This federal tax should not pre-empt state or local authorities from levying their own additional excise tax on SSBs

Accumulating evidence links diabetes to ambient environmental factors: air pollution, water contamination, and chemicals associated with metabolic and endocrine dysfunction.

Pollutants and contaminants present in air, land, water, and/or manufactured and household products include (a) particulate matter and nitrogen oxides; (b) heavy metals in water; (c) and PCBs; organochlorine pesticides; BPA, phthalates, and possibly PFAS present in plastics.

Disproportionate exposure to such environmental toxins is an underappreciated contributor to racial, ethnic, and geographic disparities in diabetes

EPA

EPA should ensure that protections are in place to limit population- and individual-level exposures to such environmental pollutants and implement abatement measures to reduce such exposures, prioritizing those that contribute to diabetes-related disparities

Lactation and Maternal Risk of Type 2 Diabetes: A Population-based Study

Eleanor Bimla Schwarz, MD, MS,[a,b,c] Jeanette S. Brown, MD,[d,e,f] Jennifer M. Creasman, MPH,[g]
Alison Stuebe, MD, MSc,[h] Candace K. McClure, PhD,[c]
Stephen K. Van Den Eeden, PhD,[i] David Thom, MD, PhD[j]

- Mothers who had never breastfed were more likely to have developed type 2 diabetes than nulliparous women (aOR 1.92)
- Mothers who never exclusively breastfed were more likely to have developed type 2 diabetes than mothers who exclusively breastfed for 1-3 months (aOR 1.52)
- Risk of type 2 diabetes among women who consistently breastfed their children for >1 month was similar to that of women who had never given birth (aOR 1.01)

Suboptimal breastfeeding in the United States: Maternal and pediatric health outcomes and costs

Melissa C. Bartick[1,2] | Eleanor Bimla Schwarz[3] | Brittany D. Green[4] | Briana J. Jegier[5] | Arnold G. Reinhold[6] | Tarah T. Colaizy[7] | Debra L. Bogen[8] | Andrew J. Schaefer[9] | Alison M. Stuebe[10,11]

Maternal disease			Cases averted/ 100,000		NNT	
Breast cancer	5,023 [3,965 to 6,021]	838 [434 to 1,245]	252 [199 to 302]	42 [22 to 62]	397 [331 to 503]	2,379 [1,602 to 4,596]
Ovarian cancer (pre-menopausal)	22 [−71 to 112]	8 [−58 to 71]	1 [−4 to 6]	0.4 [−3 to 4]	92,713 [−28,274 to ∞ to 17,788][c]	237,079 [−34,379 to ∞ to 28,254][c]
Type 2 diabetes mellitus	12,320 [10,537 to 14,162]	473 [154 to 789]	618 [528 to 710]	24 [8 to 40]	162 [141 to 189]	4,218 [2,529 to 12,952]
Hypertension (HTN)	35,982 [34,122 to 38,144]	322 [98 to 543]	1,805 [1,711 to 1,913]	16 [5 to 27]	55 [52 to 58]	6,192 [3,671 to 20,259]
Myocardial infarction (HTN)	8,487 [7,520 to 9,583]	986 [677 to 1,295]	426 [377 to 481]	49 [34 to 65]	235 [208 to 265]	2,023 [1,540 to 2,946]

Breastfeeding: lower odds of type 1 diabetes and obesity in offspring

Generates health benefits for mother that may persist for decades.

Women who breastfeed: 30%-50% reduction in type 2 diabetes

Greater benefit with greater intensity and duration

4/5 mothers breastfeed at birth

<1/2 breastfeed at 3mos

Marked racial/ethnic, SES and occupational disparities

★ Department of Labor

- Expand existing federal protections for mothers in the workplace, develop and disseminate resources to help employers comply with federal law, and implement a monitoring system to ensure that employers adequately implement lactation support programs
- Congress enact national maternity leave legislation to provide mothers with up to 3 months paid leave, shown to increase rates of initiation and enhance the duration of breastfeeding

HUD

Expand housing opportunities for low-income individuals and families in health-promoting environments and broaden implementation of its indoor smoke-free policies

HUD subsidizes housing through public authority-owned housing (>2M people), and housing vouchers (5M people) for privately owned subsidized housing (Section 8).

Fewer than 1 in 5 families (17%) eligible for public or subsidized housing receive these services

Families that need to spend >30% of incomes on housing have difficulty affording food, medications, and medical care; housing plays an important role in clinical outcomes

HUD RCT demonstrated that moving families from public housing in a high poverty zone to subsidized housing in a low poverty zone associated with lower diabetes incidence

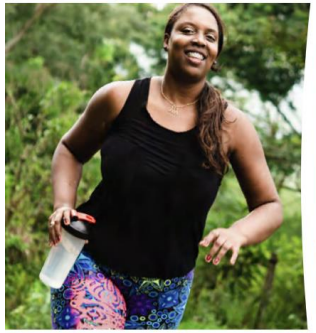
Diabetes prevalence nearly twice as high among people in public housing. Exposure to secondhand smoke also higher; particularly harmful to those living with diabetes

Dept of Transportation & HUD

Should modify their policies, practices, regulations, and funding decisions related to the built environment to enhance walkability, green space, physical activity resources, and active transport opportunities

Priority should be given to those regions and projects that could mitigate the effects of unhealthy built environments on diabetes-related disparities

- Area-level attributes such as walkability, green space, urban sprawl, physical activity resources, and active transport opportunities have been shown to be determinants of type 2 diabetes and its complications
- Built environments of areas and neighborhoods with higher concentrations of Latinos, African Americans, American Indians, and low-income individuals less health promoting than those with lower concentrations



National Clinical Care Commission

Report to Congress on Leveraging Federal Programs to Prevent and Control Diabetes and Its Complications

2021

Supported by the U.S. Department of Health and Human Services • Office of the Assistant Secretary for Health

To View the NCCC Report to Congress

https://health.gov/about-odphp/committees-workgroups/national-clinical-care-commission