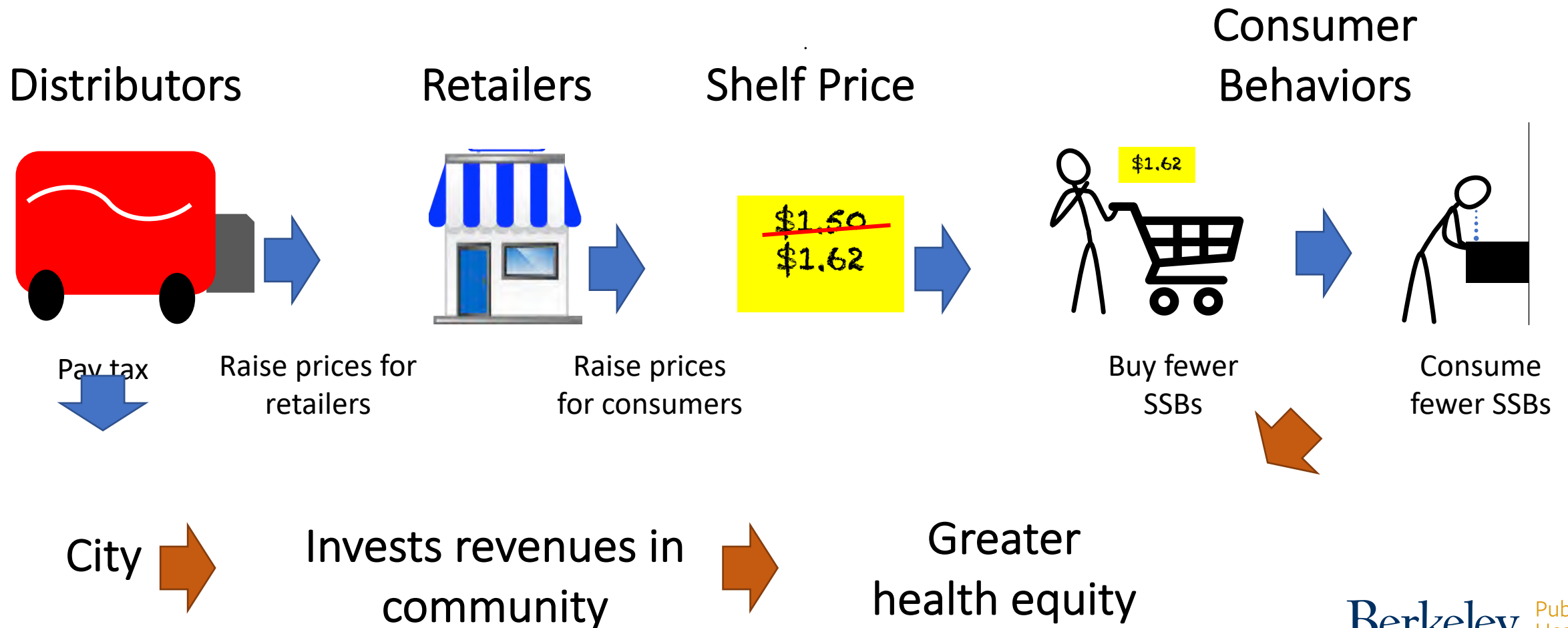


U.S. Sweetened Beverage Taxes: The State of the Evidence

Kristine Madsen, MD, MPH

Mechanism of SSB excise taxes

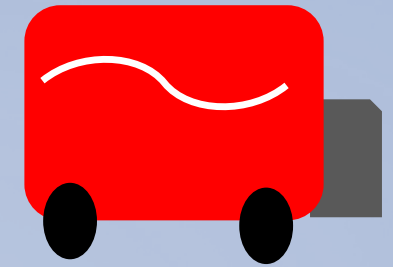


Disclaimer

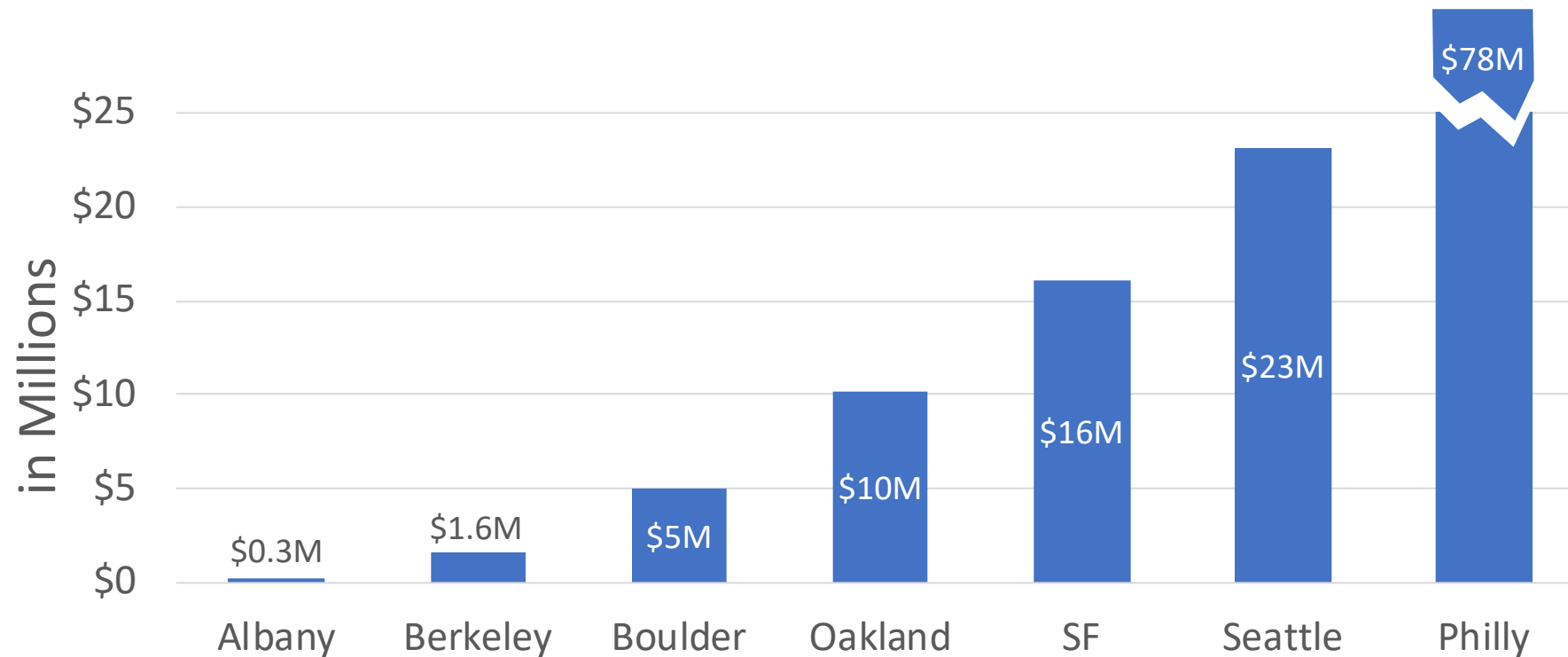
- Data from studies using comparison communities (difference-in-difference)
- Unless otherwise noted, figures are my own representations based on available data

City	Cents per ounce	Implementation date
Albany	1.0	April 2017
Berkeley	1.0	Mar 2015
Oakland	1.0	Jul 2017
San Francisco	1.0	Jan 2018
Cook County	1.0	Aug- Nov 2017
Philadelphia	1.5	Jan 2017
Seattle	1.75	Jan 2018
Boulder	2.0	Jul 2017

Revenues



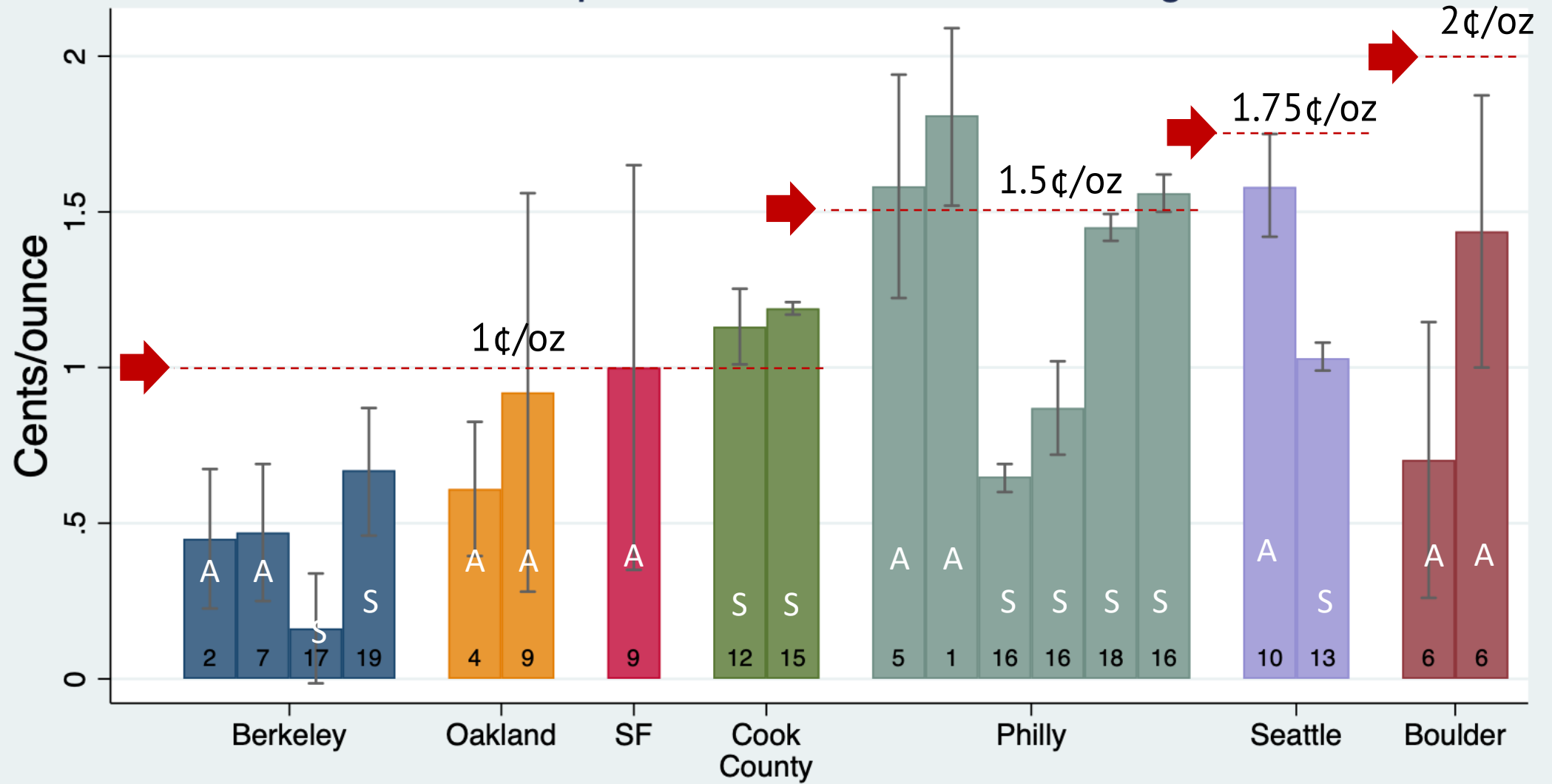
Average annual tax revenues: \$134M



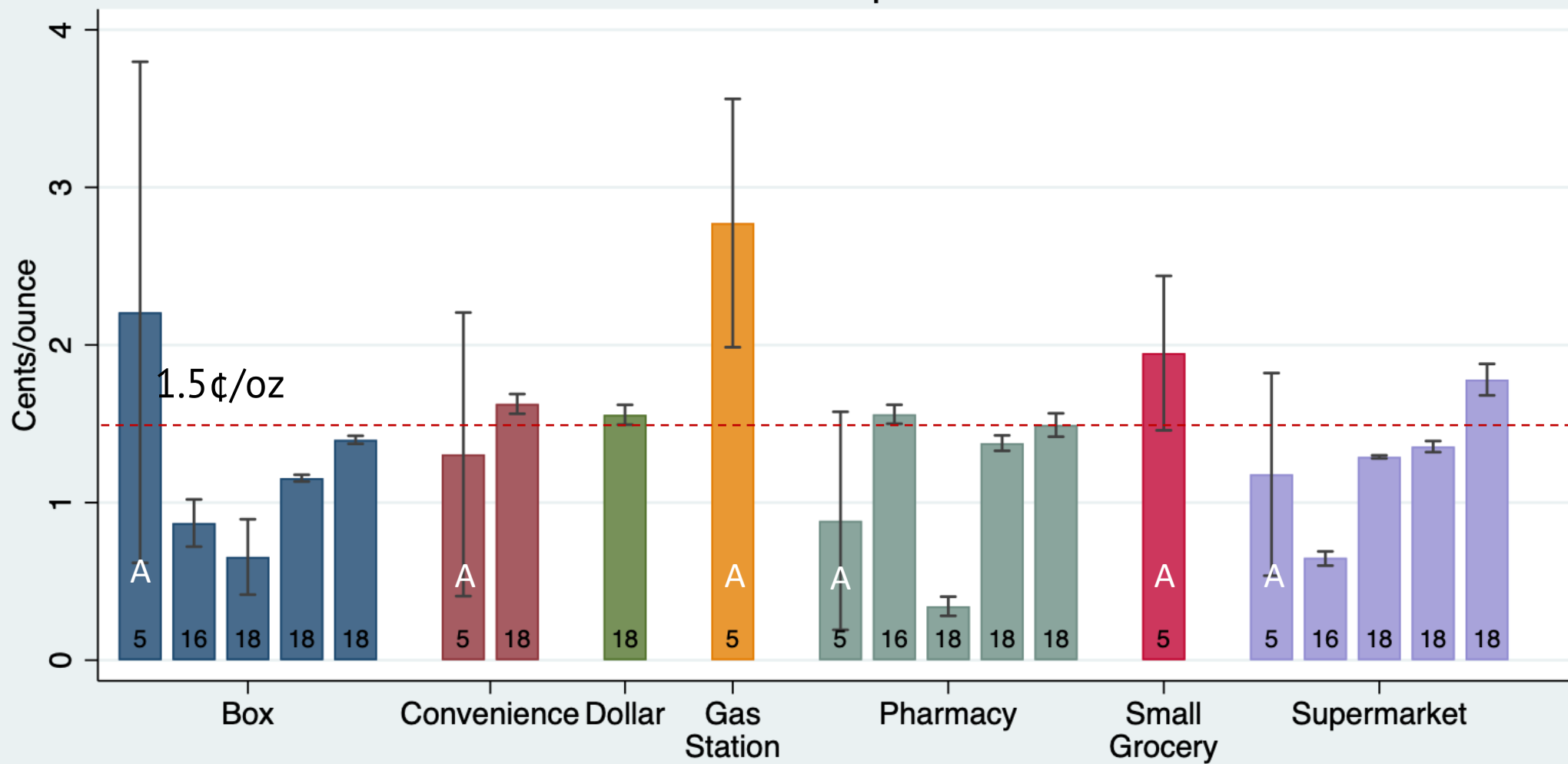
Beverages Prices

~~\$1.50~~
\$1.62

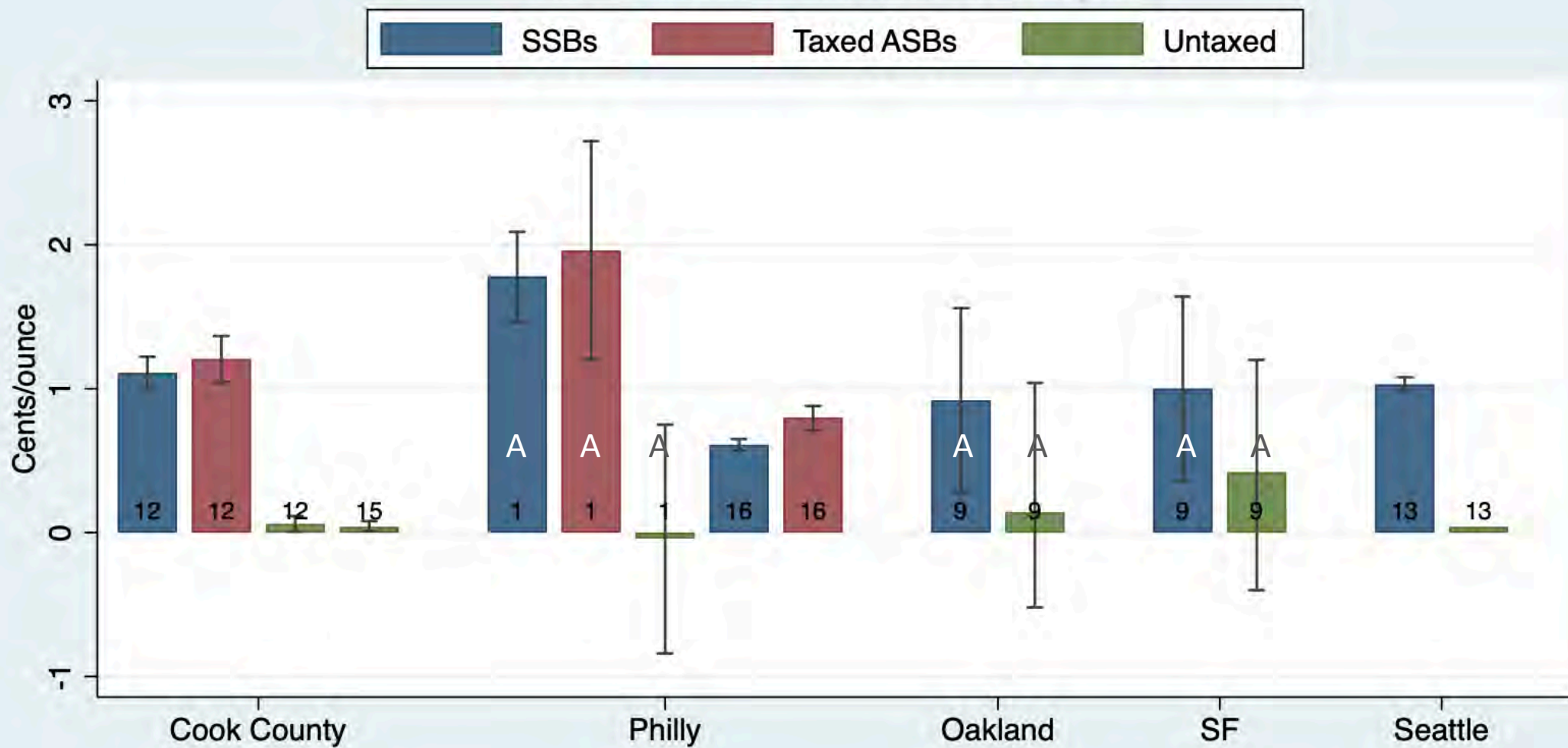
Relative price increase of taxed beverages



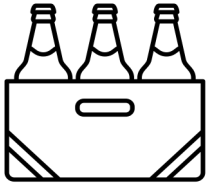
Relative price increase of taxed beverages, by store type Philadelphia



Relative price change SSBs, ASBs & Untaxed Beverages



Relative size of tax is larger for cheaper items



6 pack of soda
\$2.88 or 4¢/oz



12-oz can of soda
\$0.96 or 8¢/oz



8.4-oz energy drink
\$1.85 or 22¢/oz

Prices increase by 1¢/oz



\$3.60
25% increase

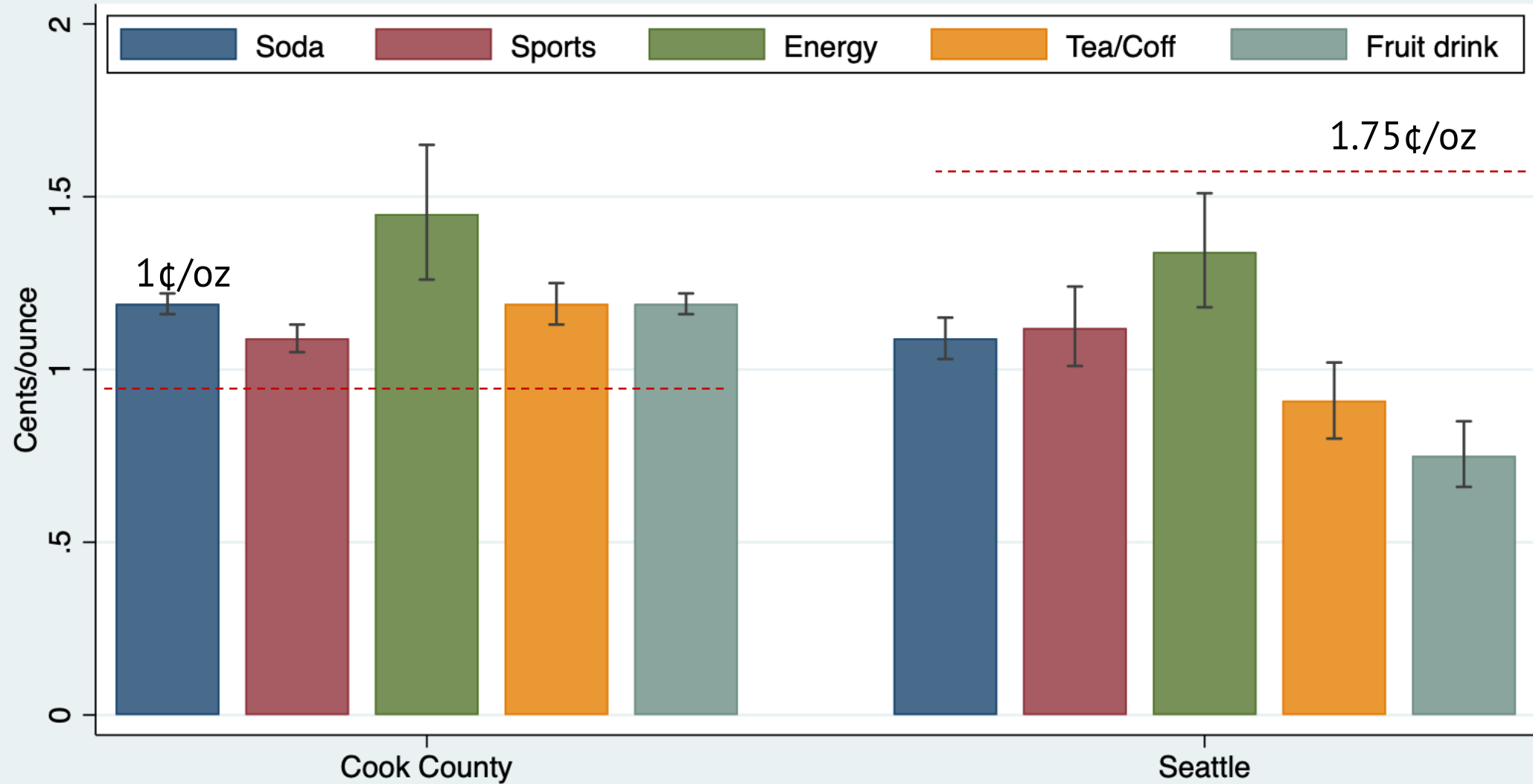


\$1.08
12.5% increase

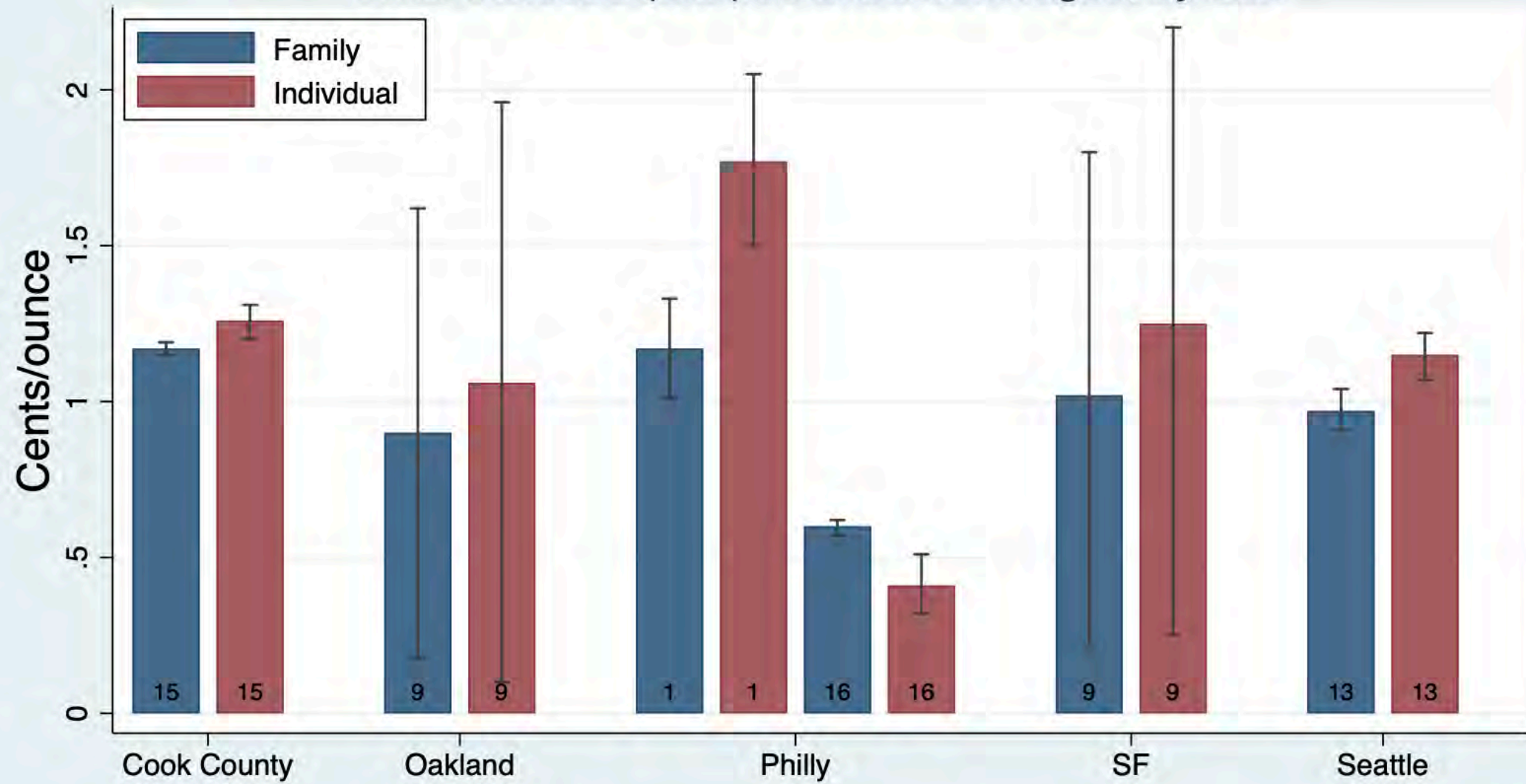


\$1.93
4% increase

Relative price change, by beverage type



Price increase (DID) of taxed beverages, by size

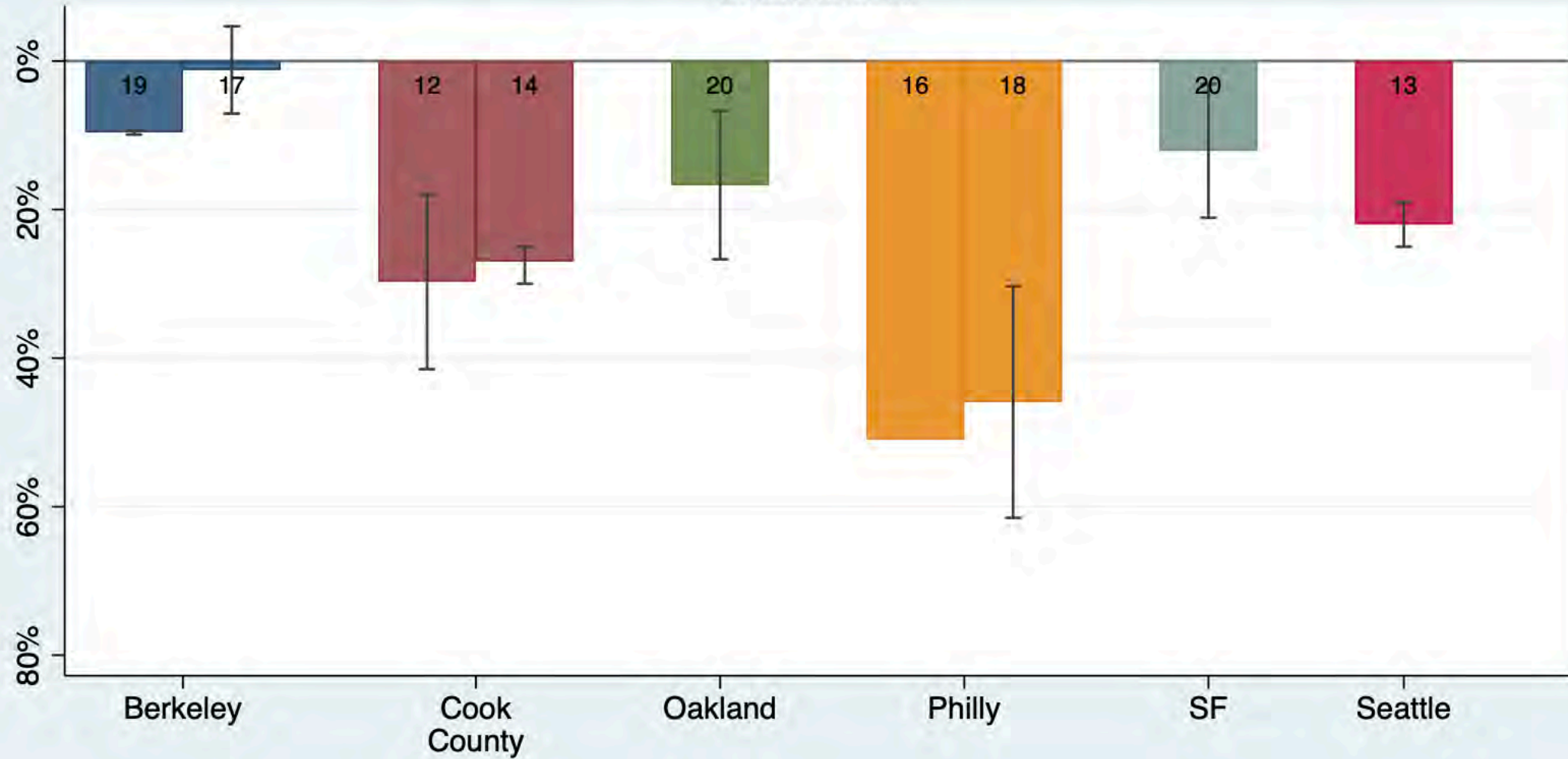


Beverage Sales



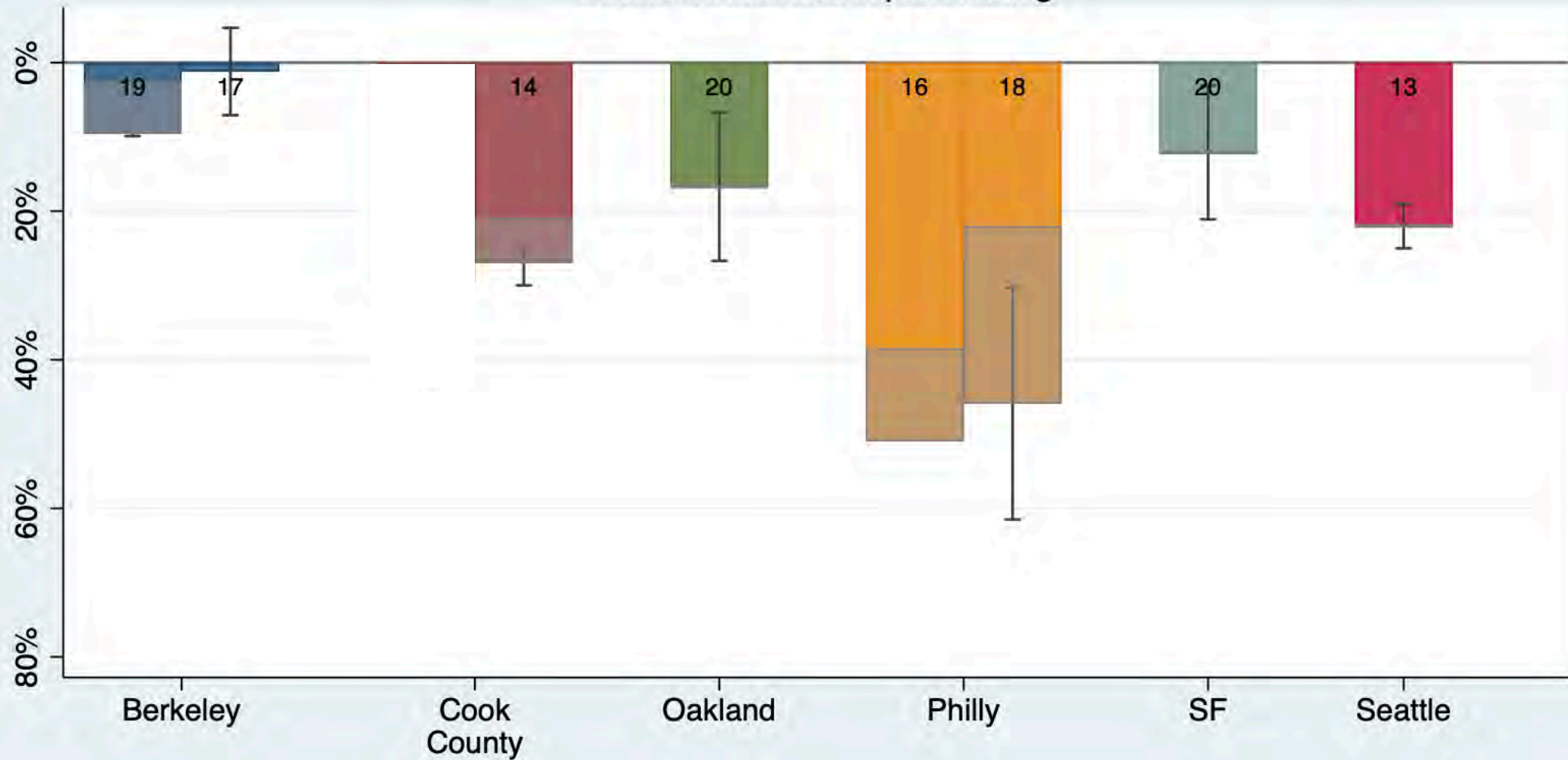
Relative change in volume sold of taxed beverages

Chain stores



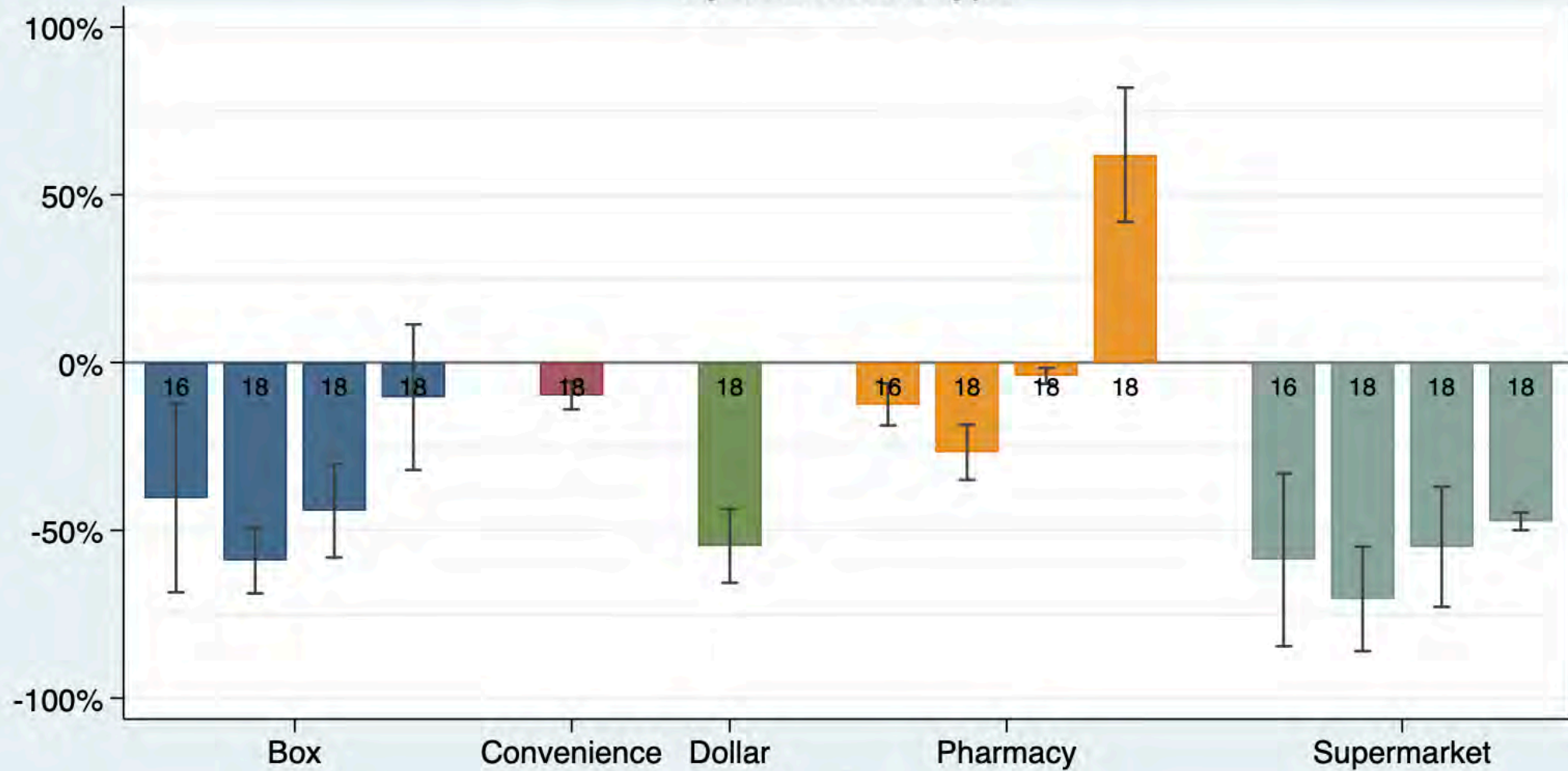
Relative change in volume sold of taxed beverages

Net of cross-border purchasing



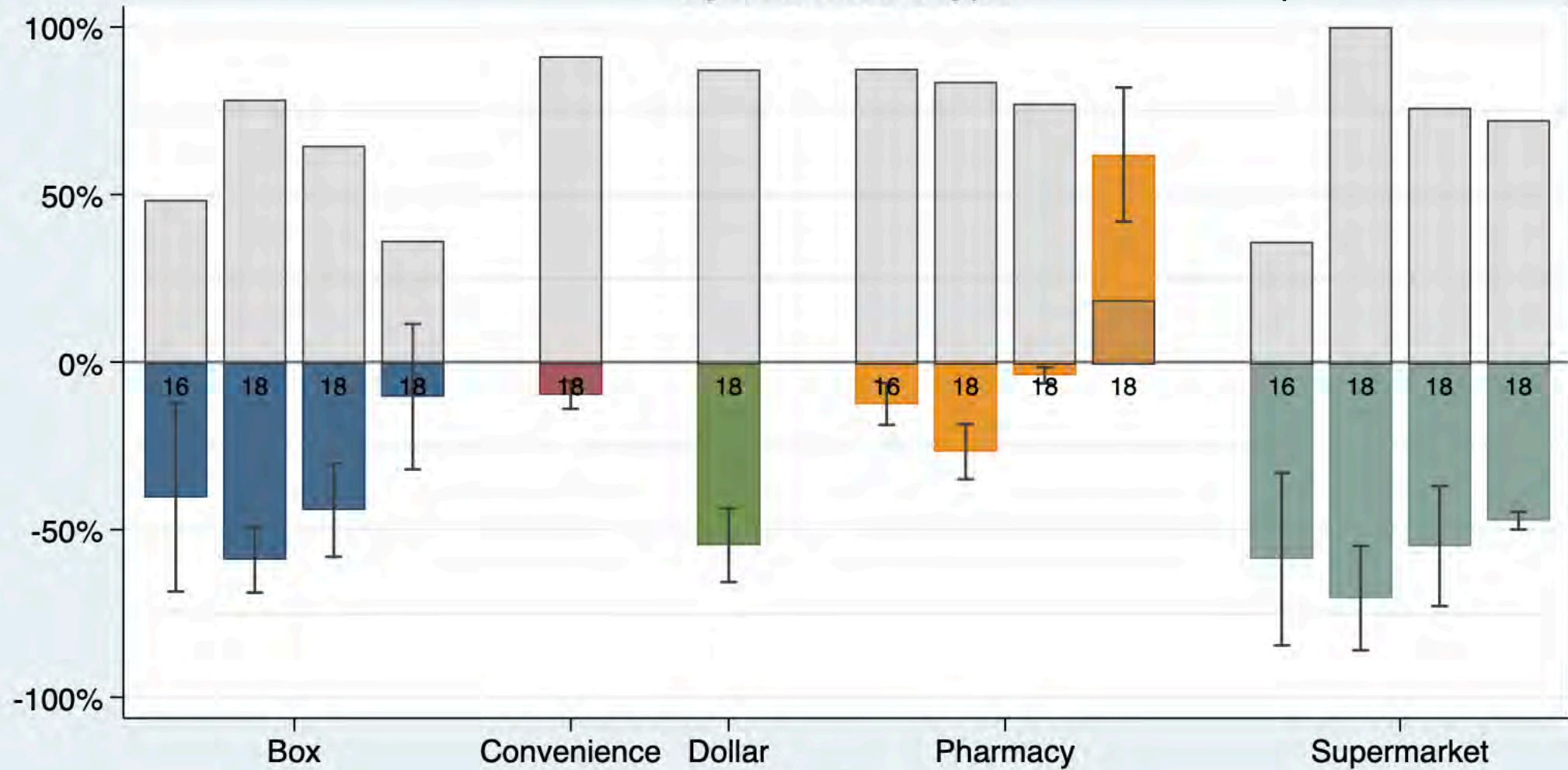
Relative change in volume sold of taxed beverages in Philadelphia

By chain store type



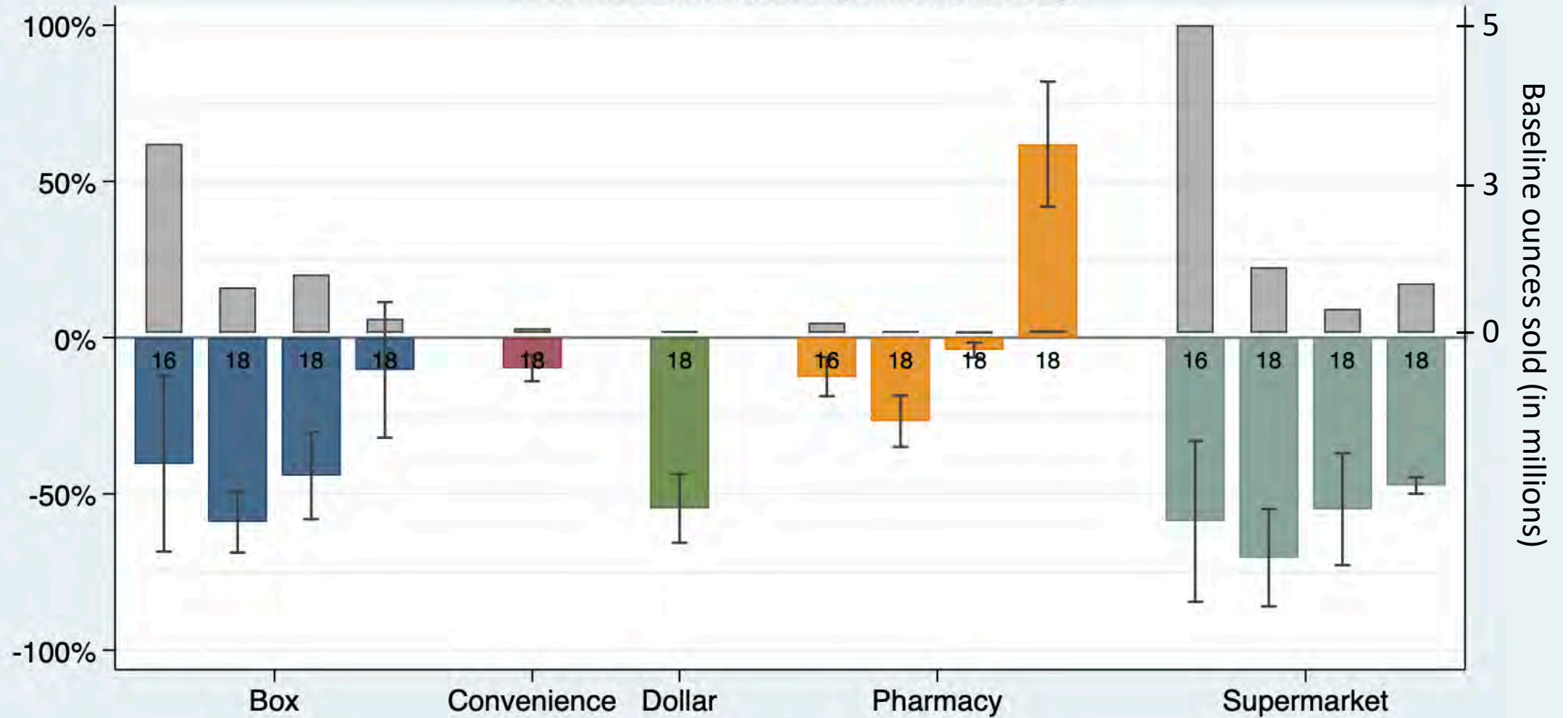
Relative change in volume sold of taxed beverages in Philadelphia

By chain store type, with relative price increase

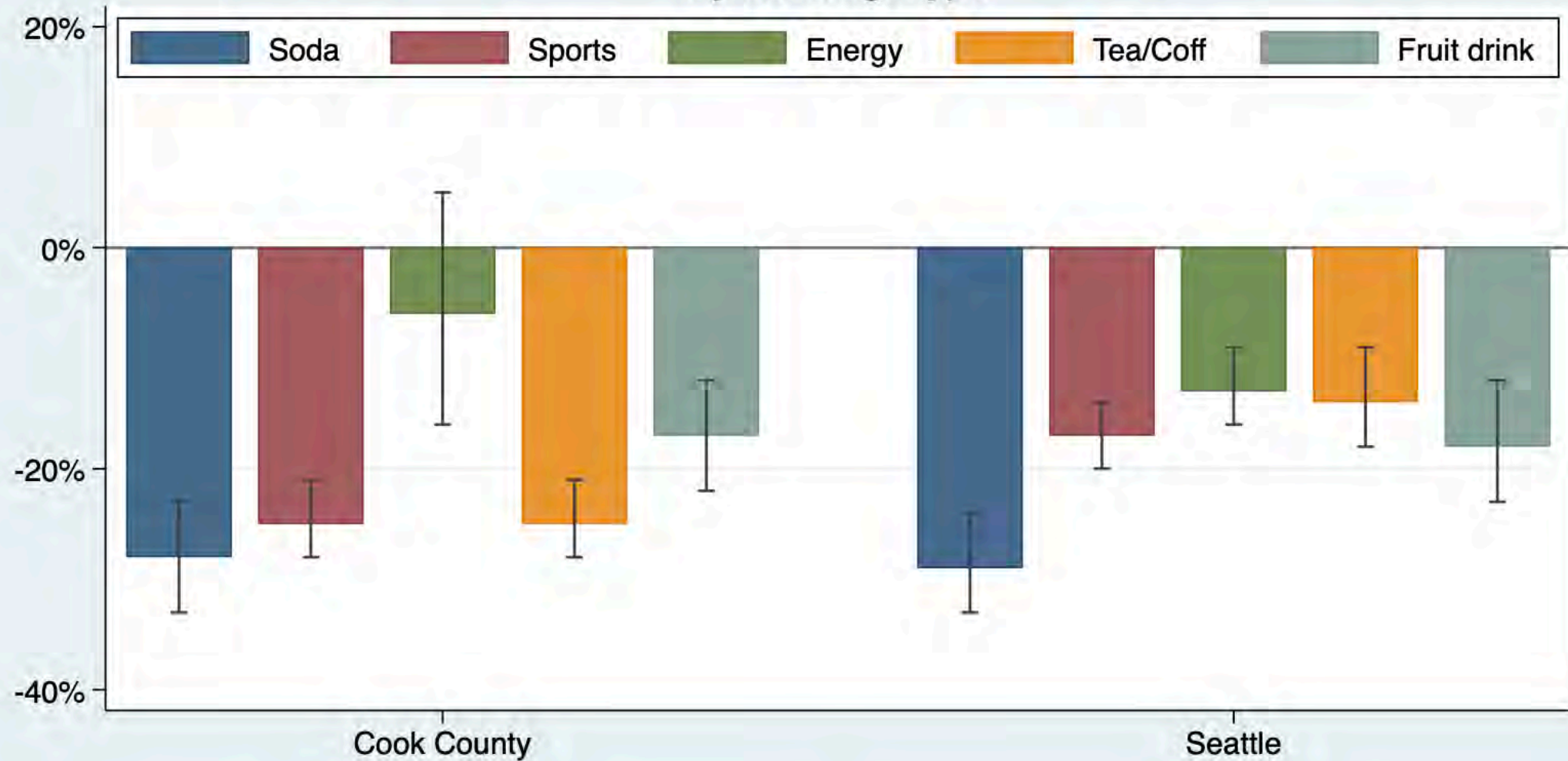


Relative change in volume sold of taxed beverages in Philadelphia

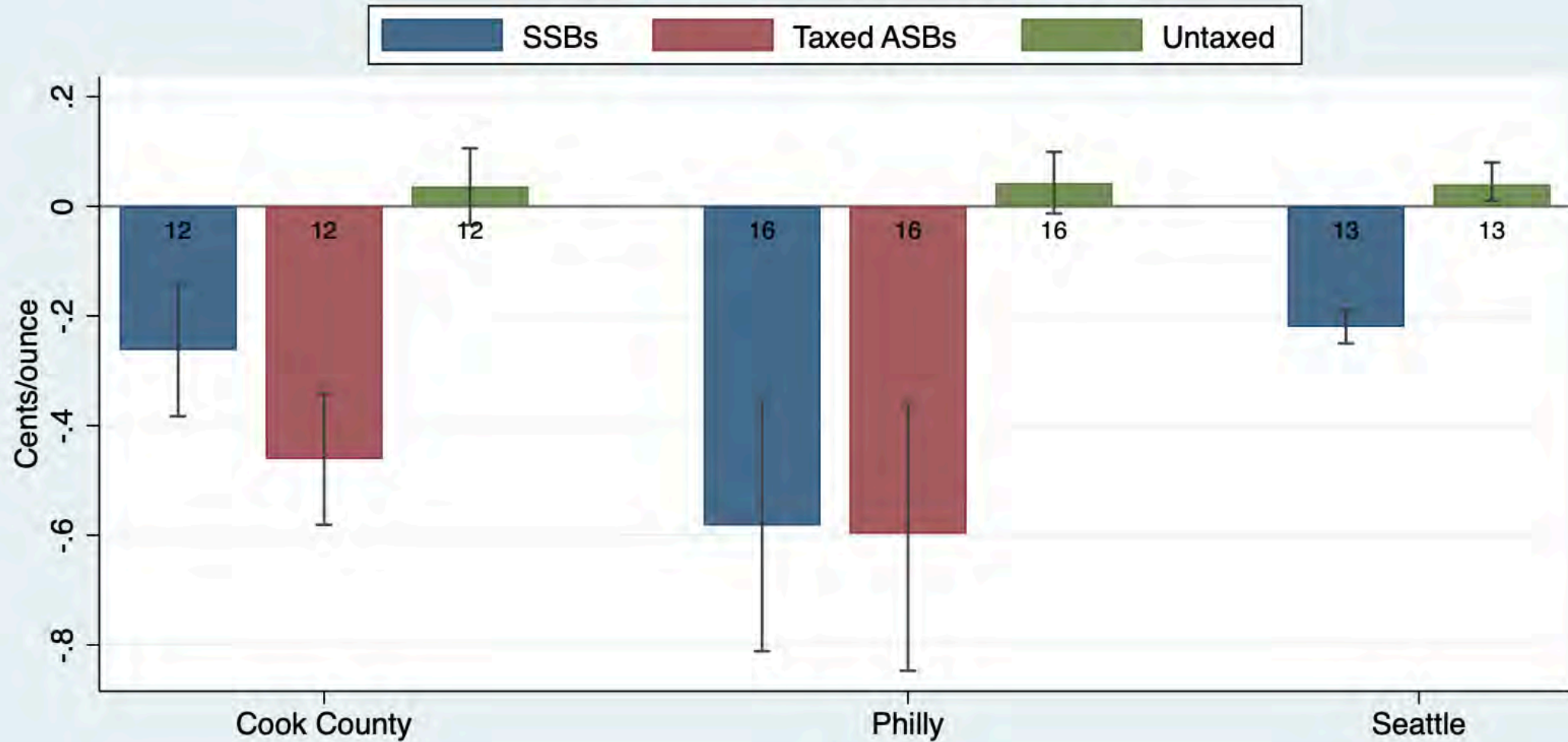
With baseline sales (millions of oz)



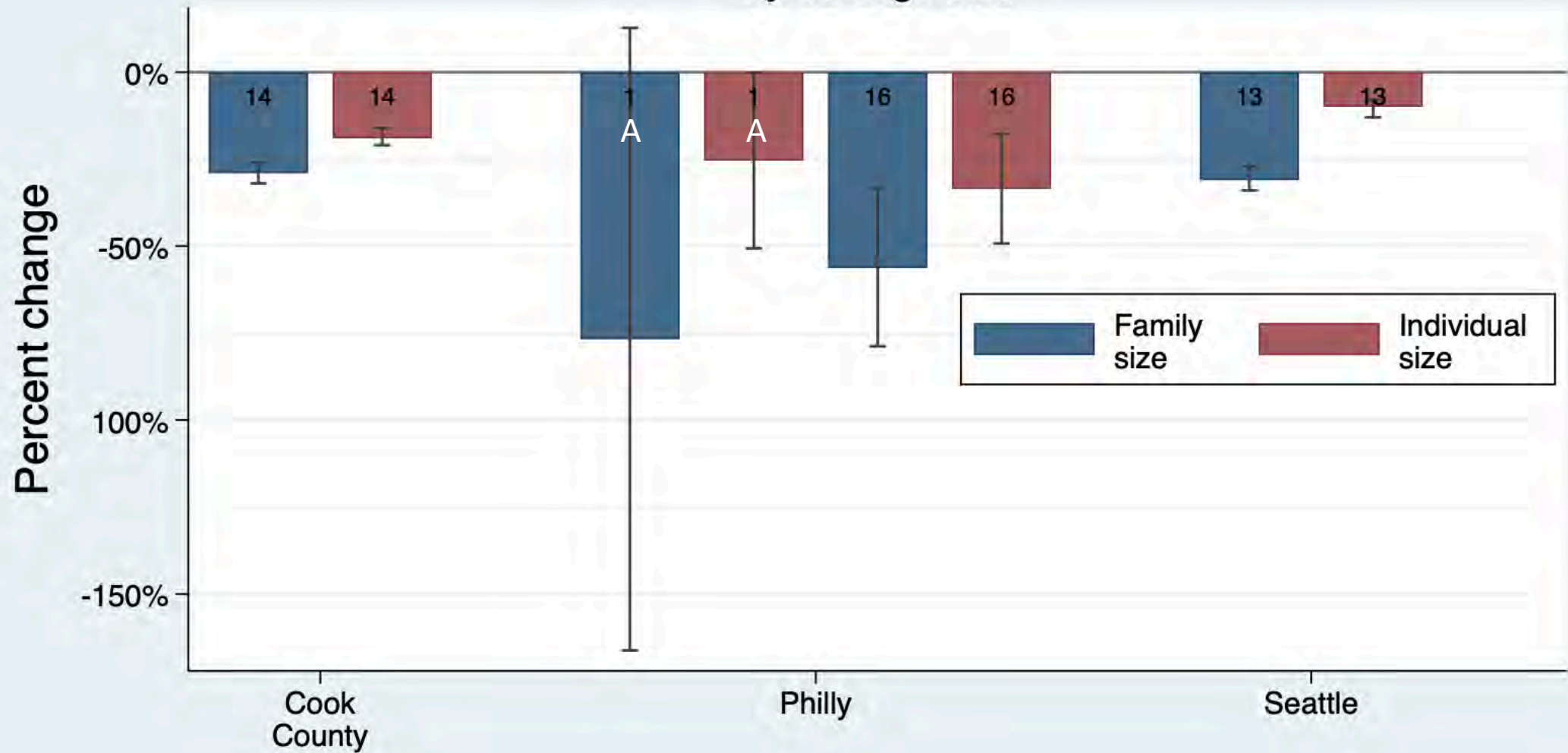
Relative change in volume sold of SSBs By beverage type



Relative change in volume sold, by beverage type SSBs, ASBs & Untaxed Beverages

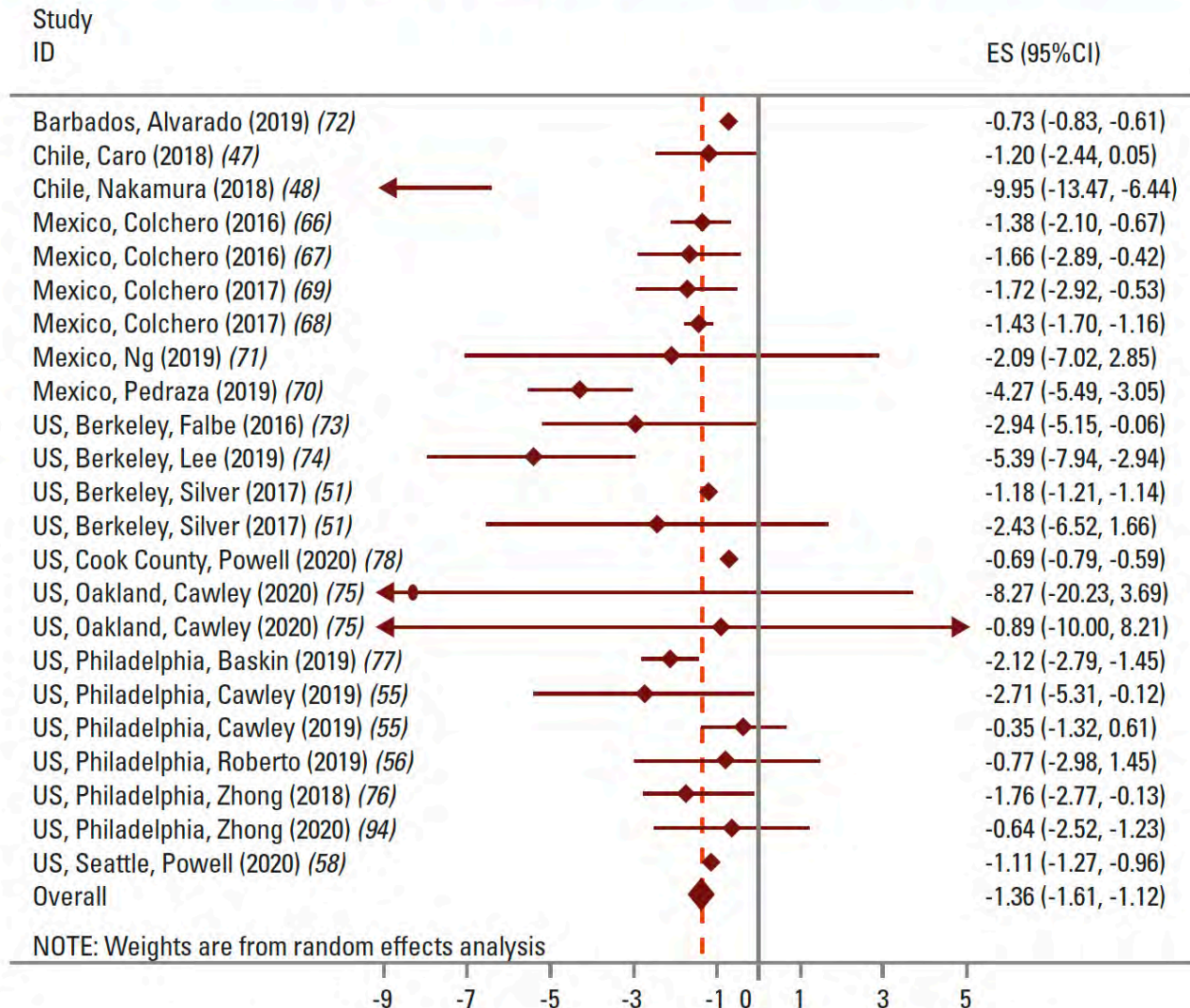


Relative change in volume sold of taxed beverages By beverage size



Price elasticity of demand for SSBs

Adjusted for local policy pass-through and cross-border shopping



Source: Prepared by Keith B. Marple (Brandeis University), Lisa M. Powell (University of Illinois at Chicago) and Tatiana Andreyeva (University of Connecticut).



Pan American
Health
Organization

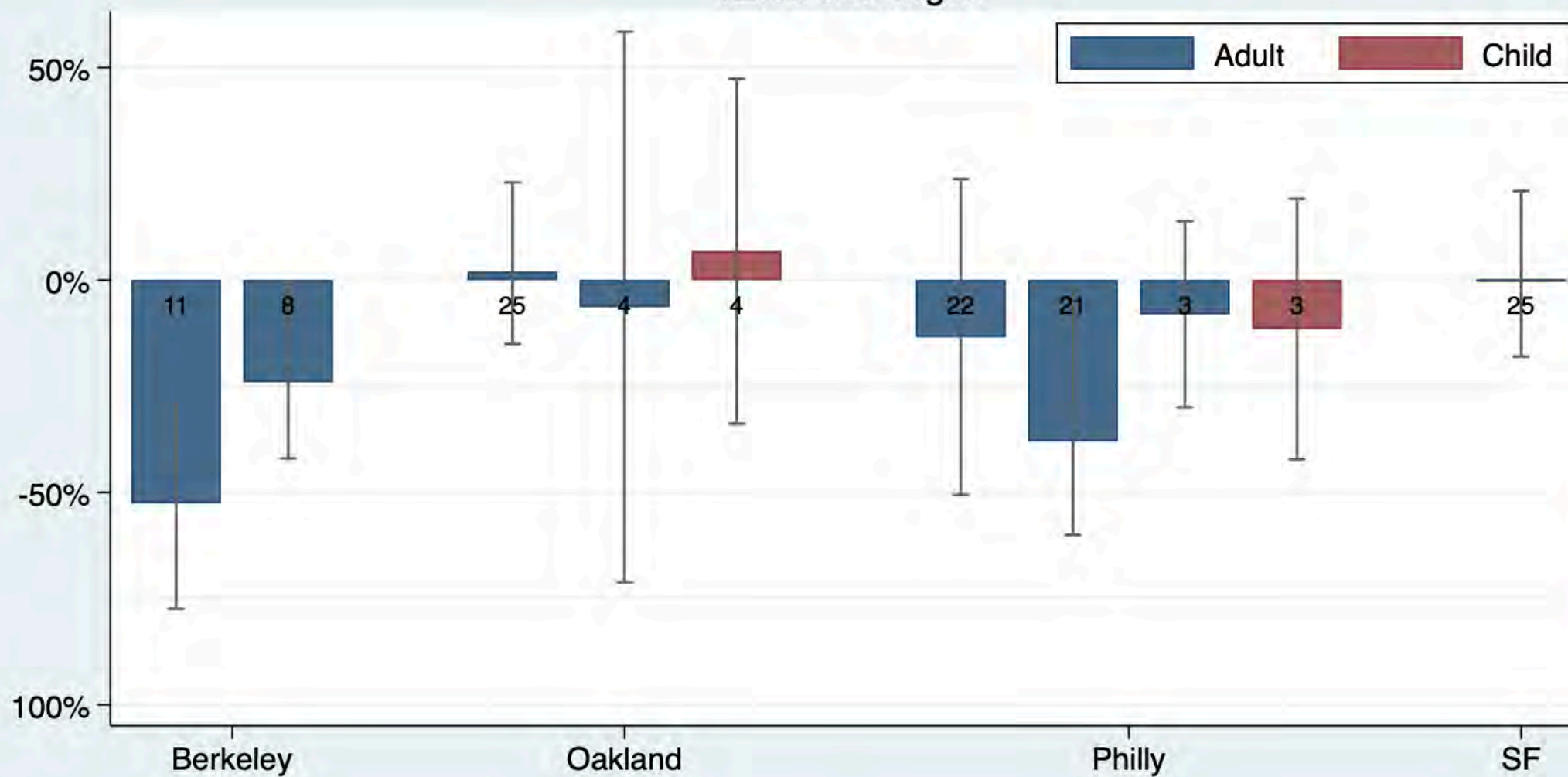


World Health
Organization
REGIONAL OFFICE FOR THE
Americas

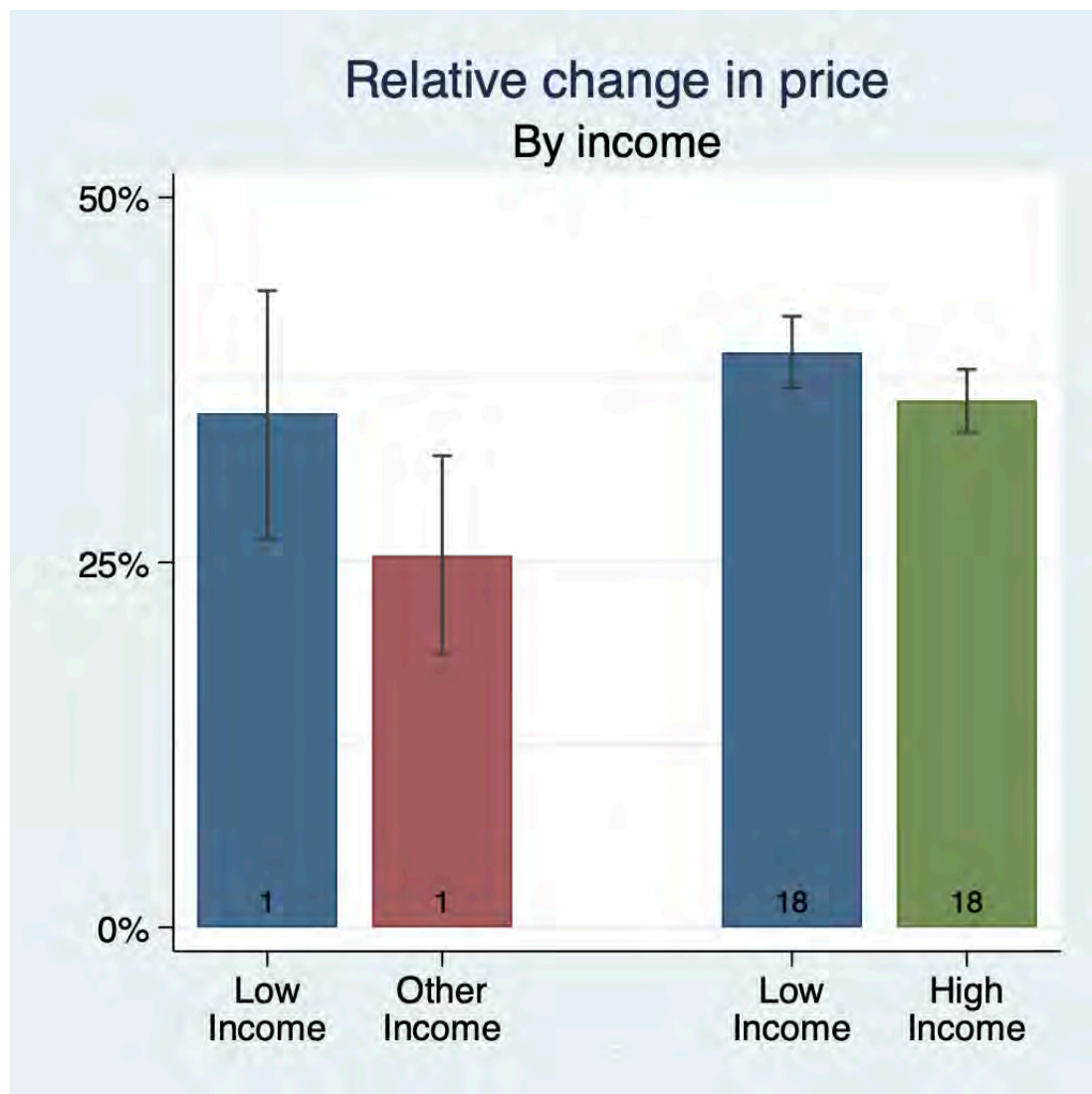
Consumption

Relative change in frequency of consumption

Taxed beverages

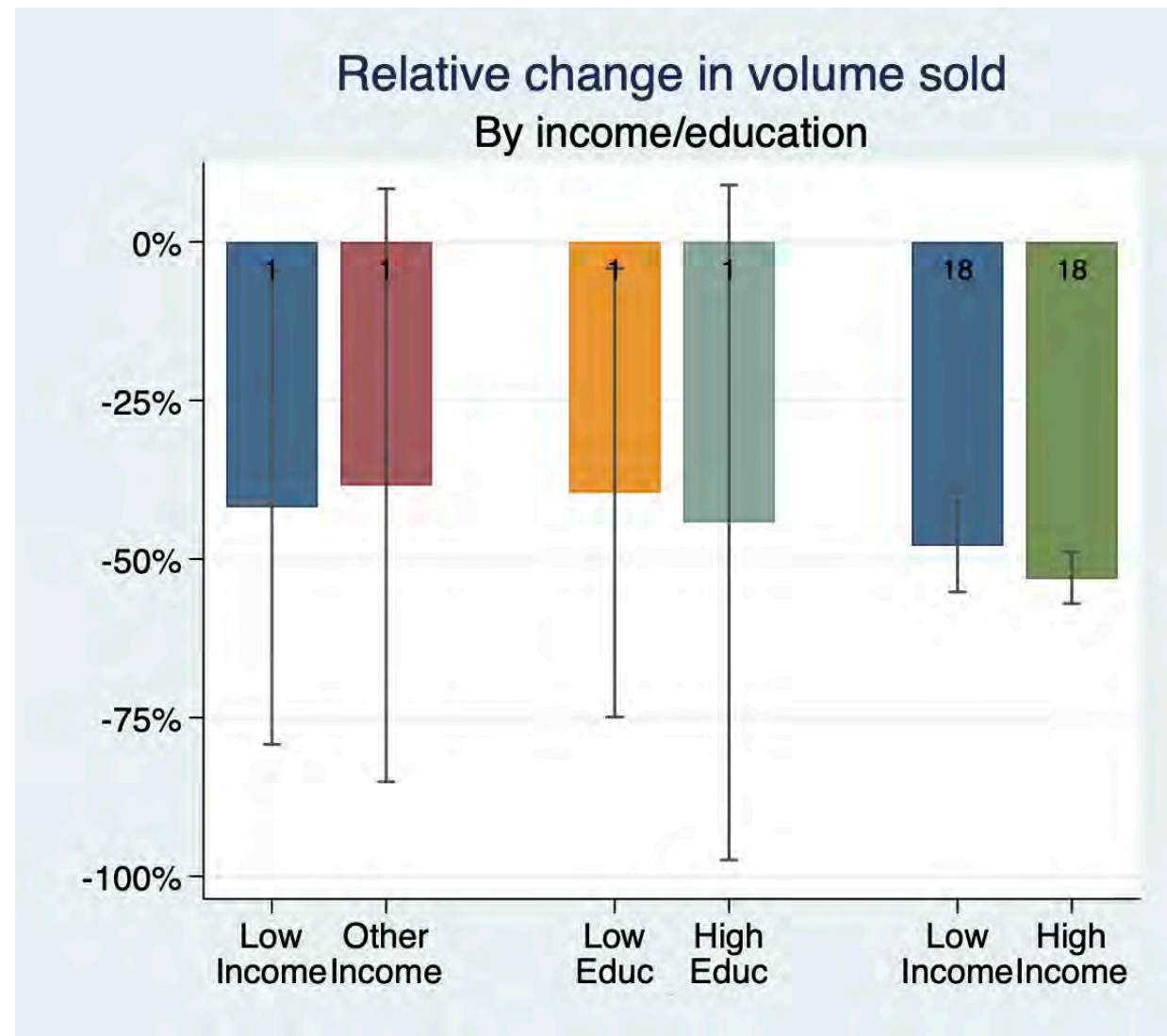


Heterogeneity and Implications for Health Equity



Small non-chains

Chains



Small non-chains

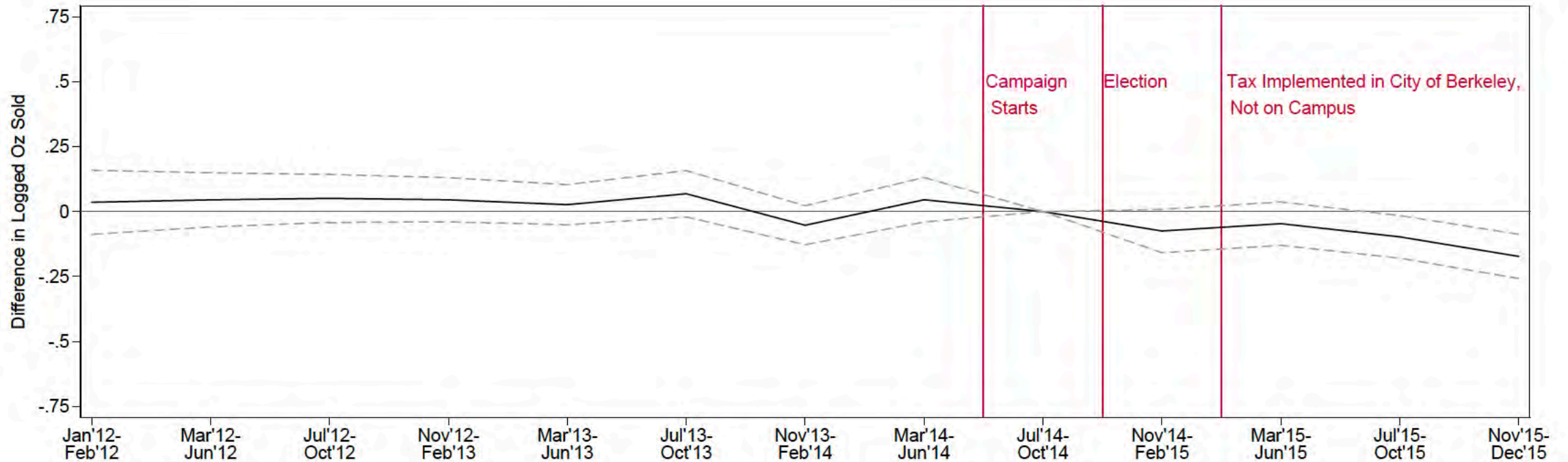
Chains

1. Bleich S, et al. *Health Affairs*, 2020.

18. Seiler B, et al. *J Market Research*, 2020.

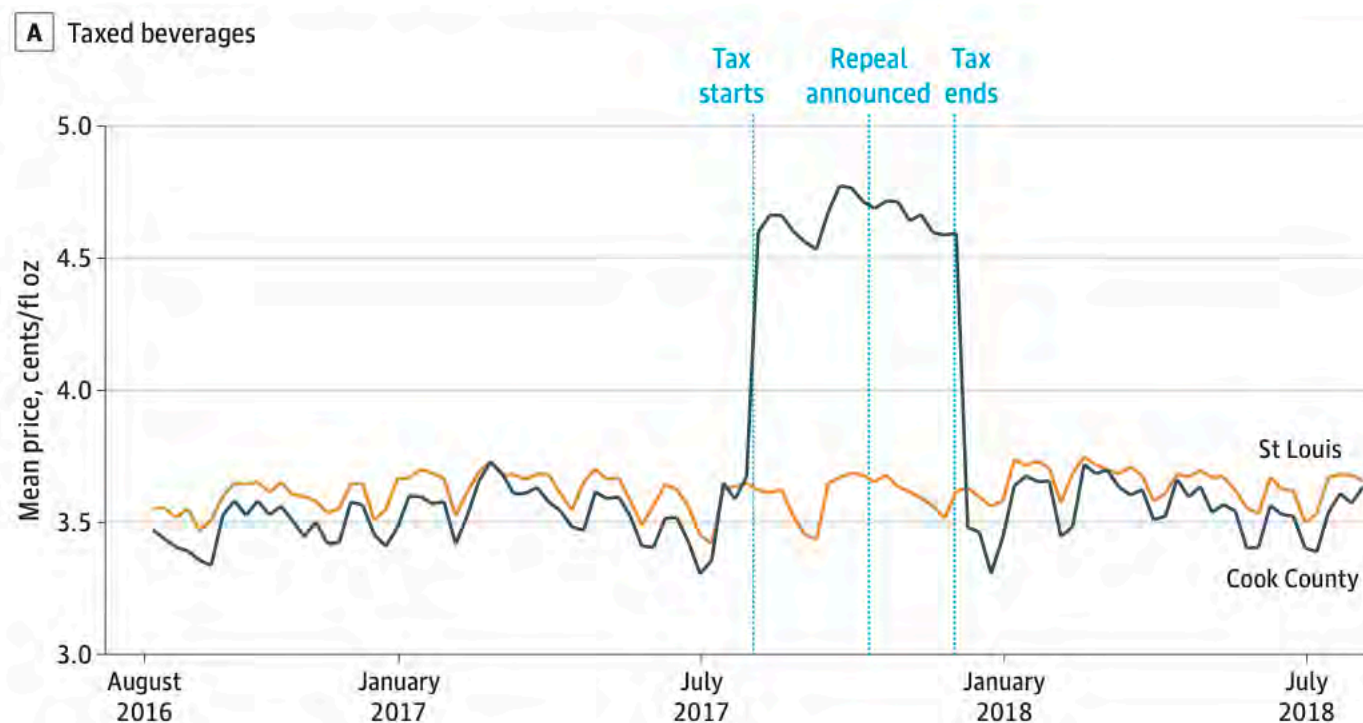
‘Signaling,’ perceptions & confusion

SSB sales on Berkeley campus declined post-election, but prior to price increases



Sales in Cook County rebounded post tax repeal

Figure 1. Taxed and Untaxed Beverage Prices in Cook County, Illinois, and St Louis County and City, Missouri, Pretax Implementation, Posttax Implementation, and Posttax Repeal



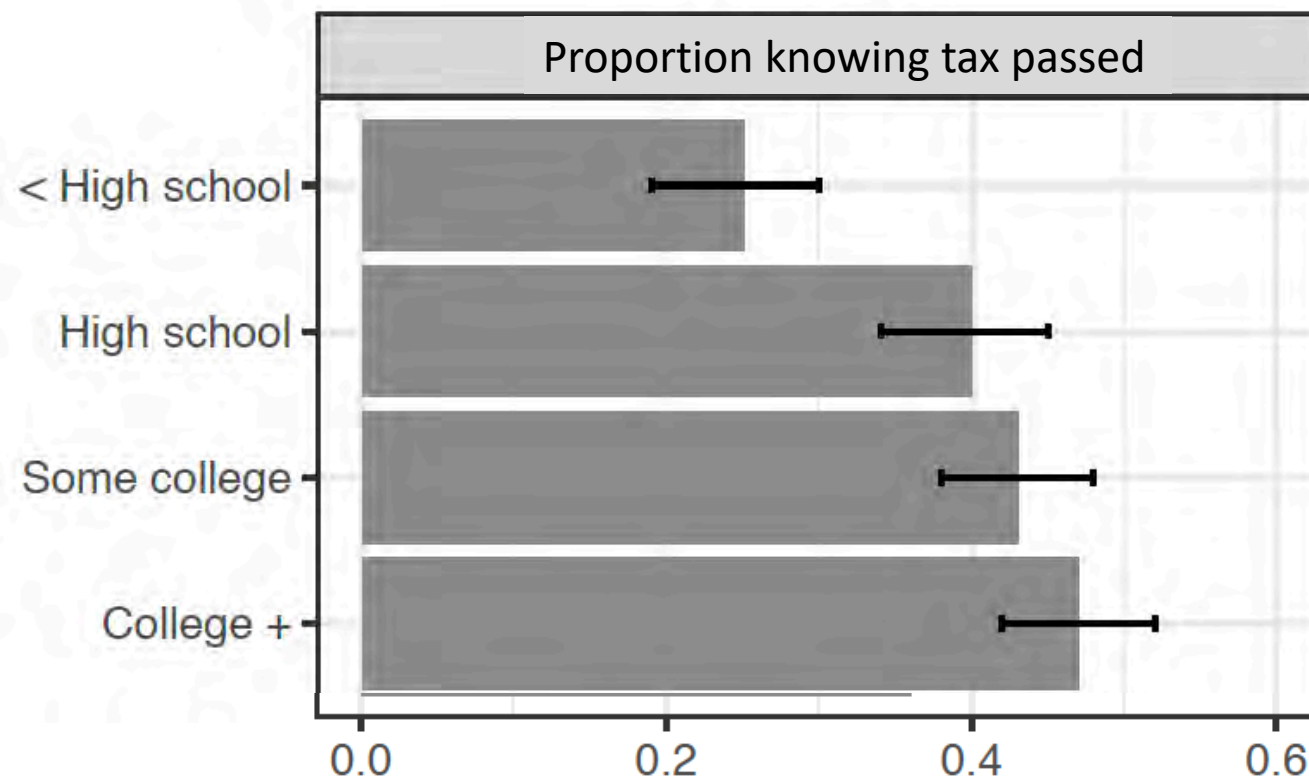
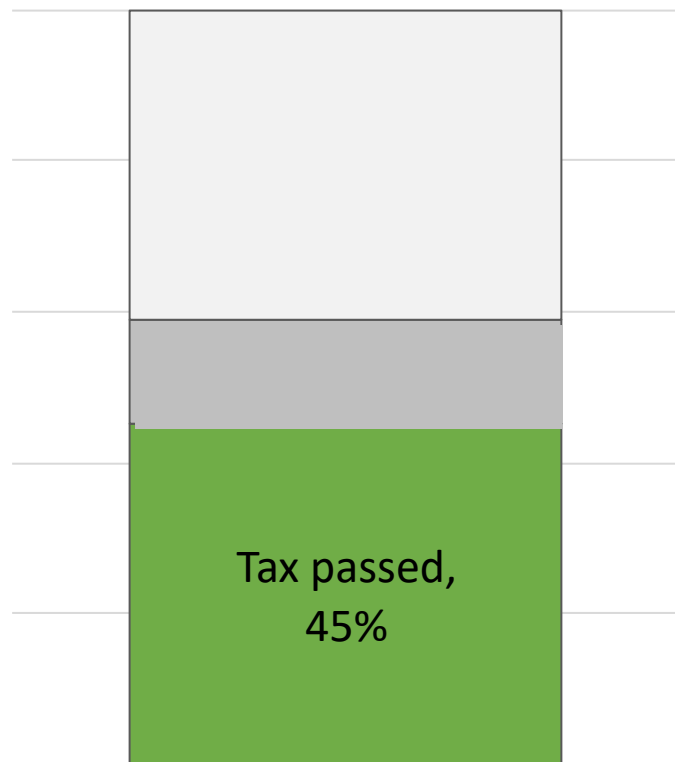
Is Berkeley special or was 'signaling' a spurious association?

- Grass-roots coalition
- Clear messaging
- Health focus (advisory board)



Confusion about tax passing

1 year after tax passed



Complaints from customers

“At the beginning we had arguments with customers. They did not know about the tax and thought it was just our store charging more, and it got confrontational.”

- Retailer, Berkeley Corner store

Confusion about who is taxed

- Nearly all low-income parents in focus groups were confused about how tax worked

“If they’re taxing the corporations, I think that’s a good thing... I think that they should be taxed because they are being harmful to us and to our community. But if they are taxing the consumer...?”

- UC Berkeley Student parent

While retailers report minimal impact of SSB taxes on business...

- Among 103 randomly selected retailers in Bay Area taxed cities:
 - 70% of retailers reported no or minimal effect of tax on their business
 - 76% had no concerns about the tax
 - 54% thought there should be a statewide tax

Results were consistent
across store type and
neighborhood income level

Retailers don't know how tax revenues are being used

- Only 9% of retailers in taxed cities had heard about how revenues would be used

“It’s good for health, but I do not trust politicians. Where is the money going?”

- *Retailer, Oakland Corner store*

“The tax only benefits the government as the money goes to a general fund. The tax is only good if the money actually goes to childhood obesity, education, and health education.”

- *Retailer, Berkeley Corner store*

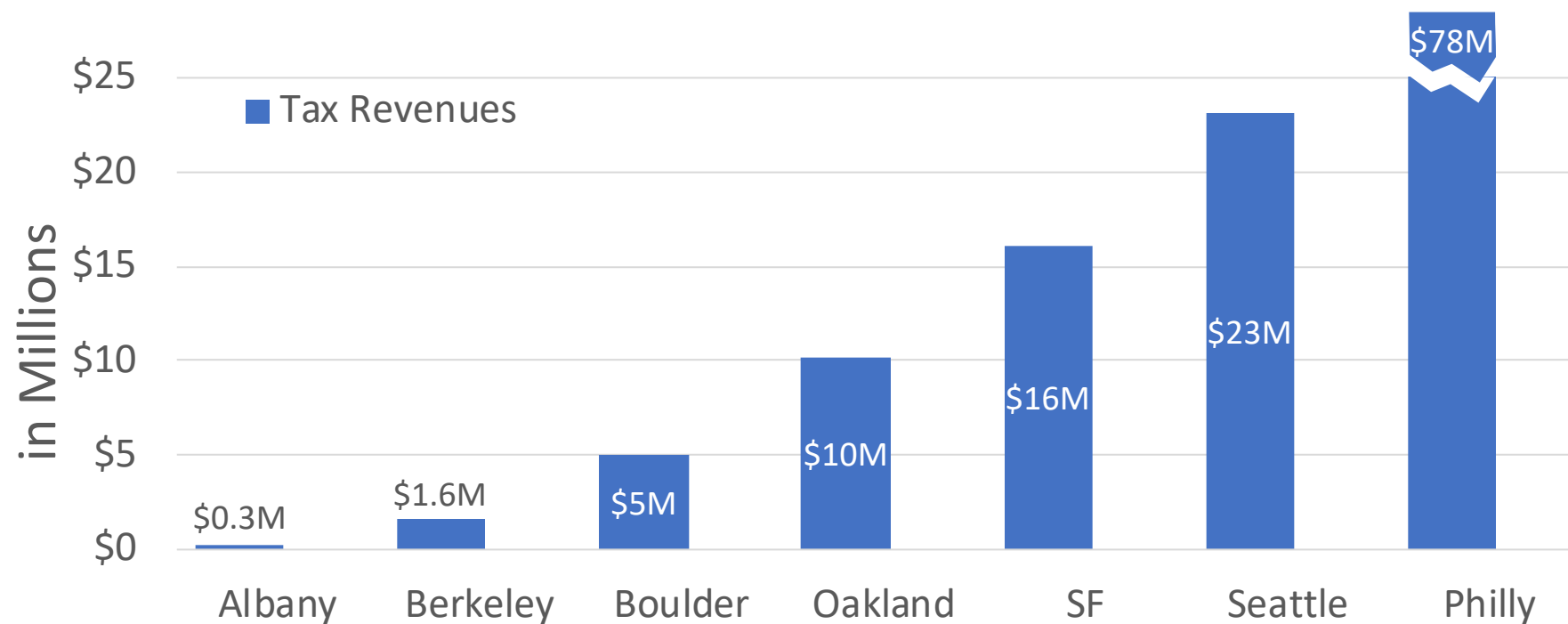
How SSB tax revenues are being invested

How cities allocated SSB Tax Revenues

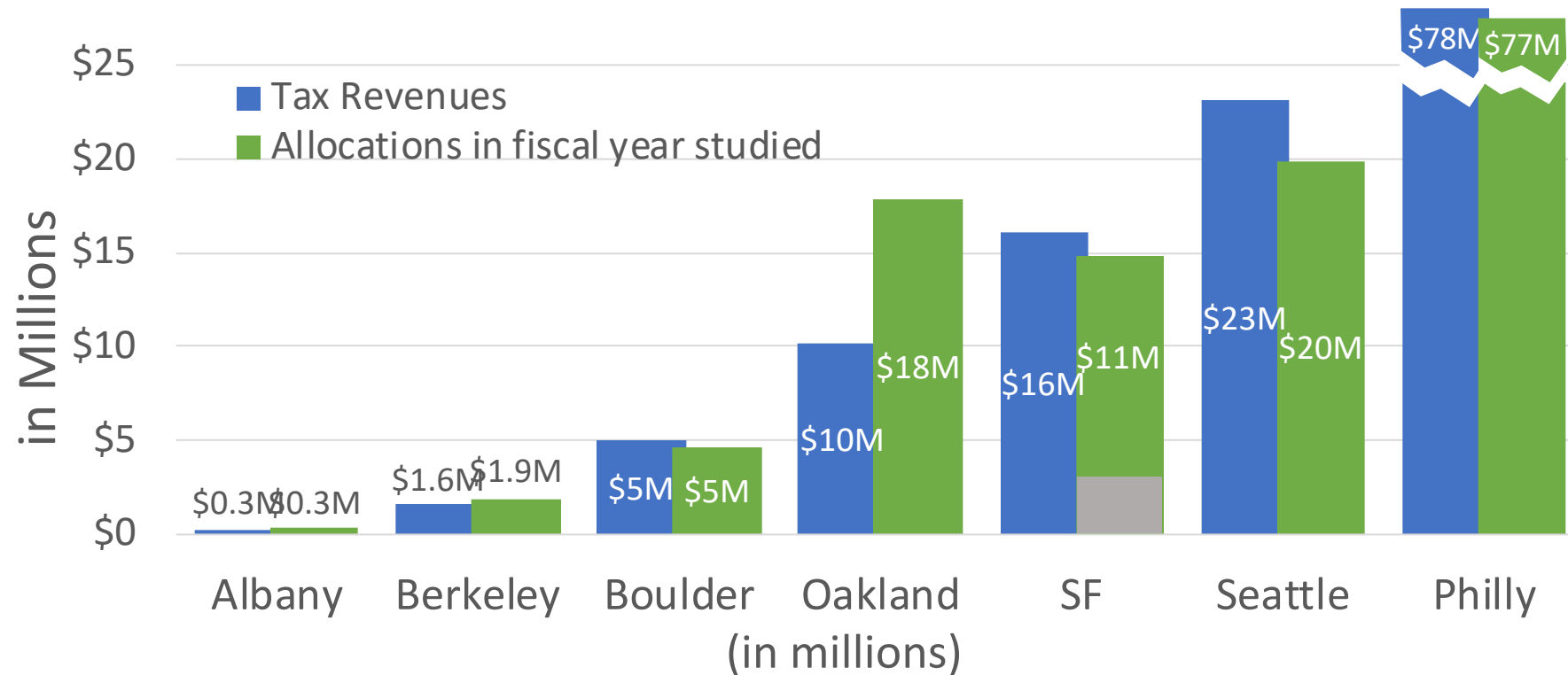


- Document review
- Most recent fiscal year
- 189 allocations from SSB tax revenues, totaling \$133M

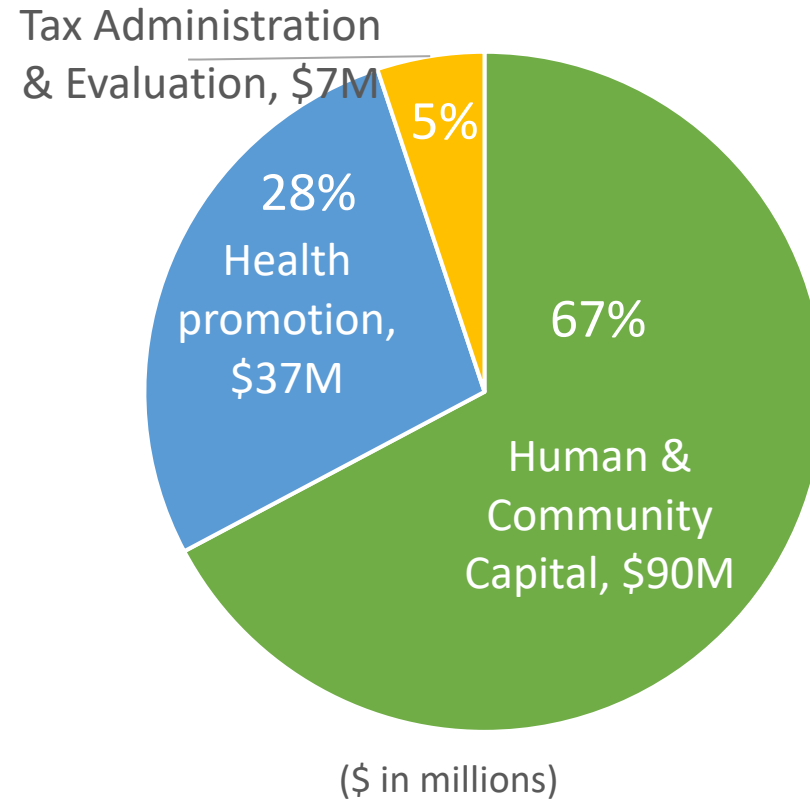
Average annual tax revenues: \$137M



Tax revenues and revenue allocations



We organized allocations into 3 major buckets



\$90M invested in Human & Community Capital



Job training provides workers substantial financial gains



African-American youth 6-10X more likely to drown

Economic & Human Development, \$7M

Youth Development, \$4M

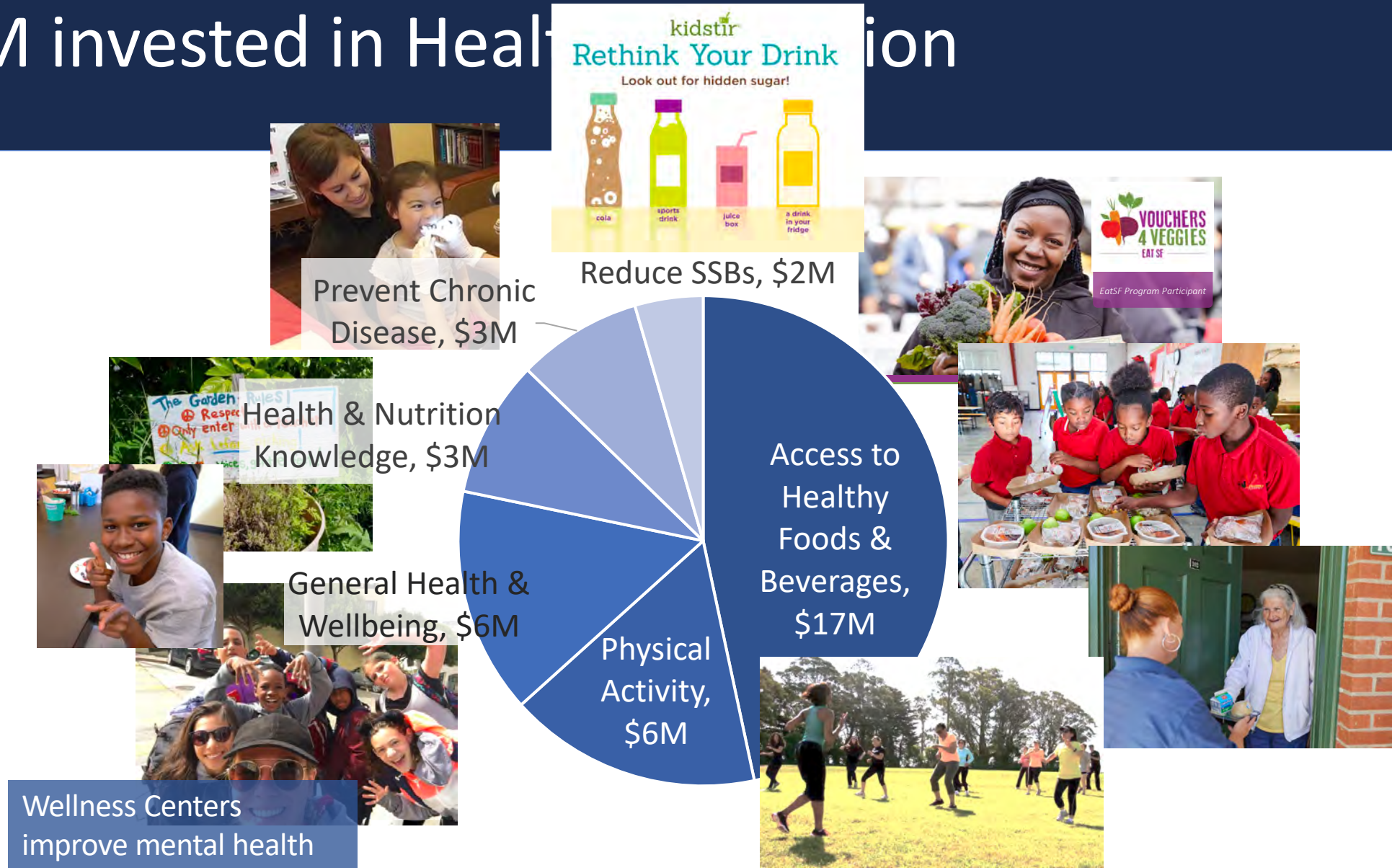
Improve Infrastructure, \$21M

Early Childhood Support, \$58M

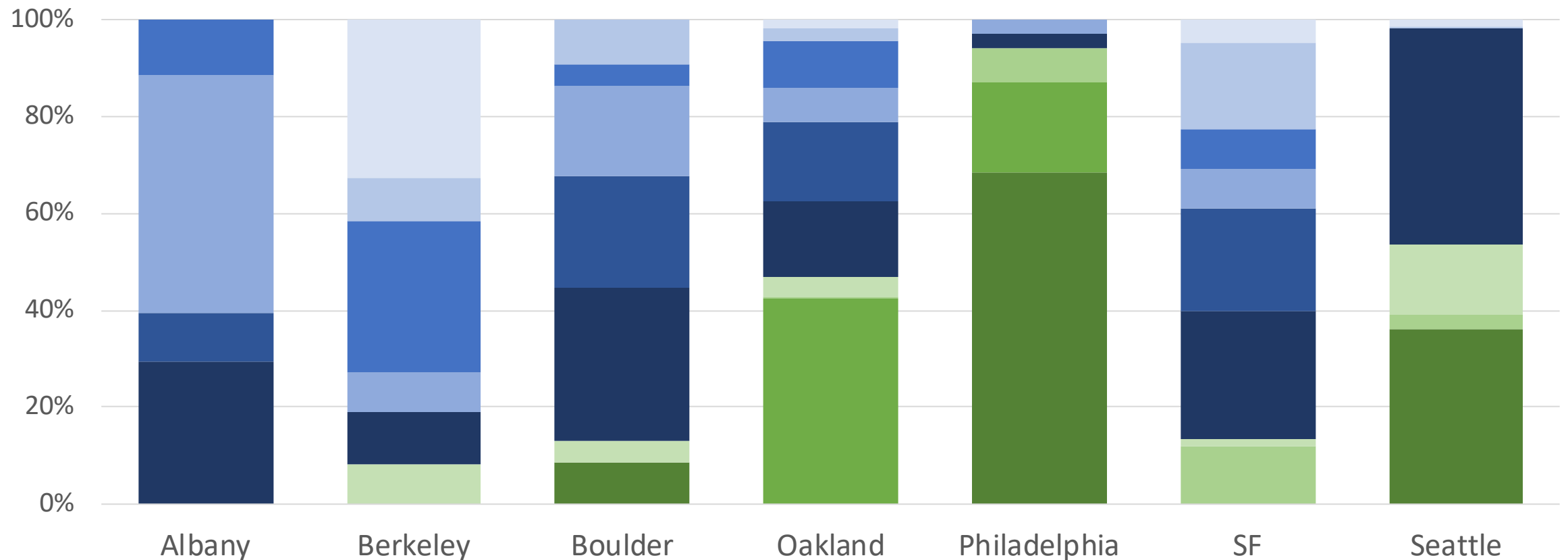


- High school completion
- 4-year college
- Employment

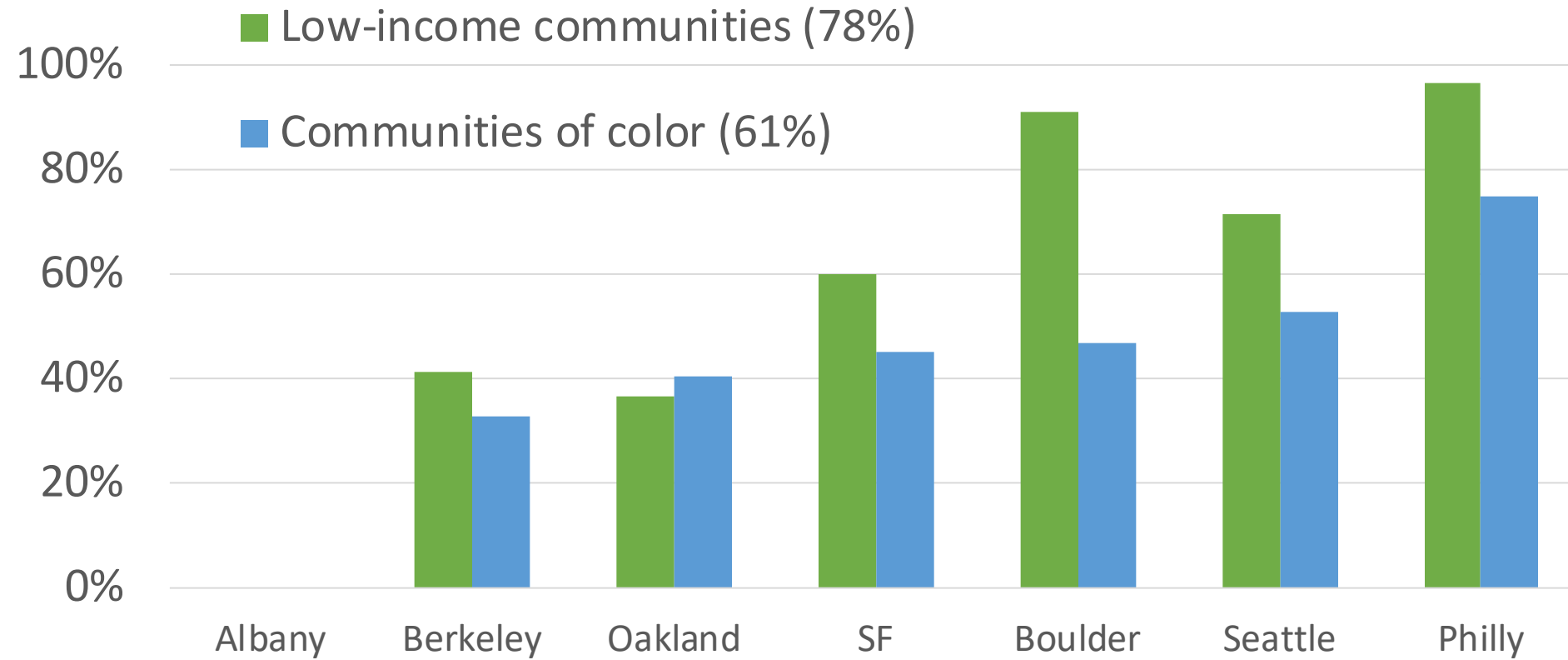
\$37M invested in Health Promotion



Investments vary widely by city



Investing in Equity



Summary

- Net reduction in SSB sales of 20% or more in the largest cities
- Revenue allocations are consistent with intent of taxes
- Gaps:
 - Need to educate public on mechanism and benefits of taxes
 - Impact of taxes by baseline consumption
 - Substitution
 - Larger geography taxes

Numbered References: Price, Sales and Consumption

1. Bleich SN, Lawman HG, LeVasseur MT, et al. The Association Of A Sweetened Beverage Tax With Changes In Beverage Prices And Purchases At Independent Stores. *Health Aff (Millwood)*. 2020;39(7):1130-1139. doi:10.1377/hlthaff.2019.01058.
2. Cawley J, Frisvold DE. The Pass-Through of Taxes on Sugar-Sweetened Beverages to Retail Prices: The Case of Berkeley, California. *J Pol Anal Manage*. 2016;36(2):303-326. doi:10.1002/pam.21960.
3. Cawley J, Frisvold D, Hill A, Jones D. The impact of the Philadelphia beverage tax on purchases and consumption by adults and children. *Journal of Health Economics*. 2019;67:102225. doi:10.1016/j.jhealeco.2019.102225.
4. Cawley J, Frisvold D, Hill A, Jones D. Oaklands sugar-sweetened beverage tax: Impacts on prices, purchases and consumption by adults and children. *Economics & Human Biology*. 2020;37:100865. doi:10.1016/j.ehb.2020.100865.
5. Cawley J, Frisvold D, Hill A, Jones D. The Impact of the Philadelphia Beverage Tax on Prices and Product Availability. *J Pol Anal Manage*. 2020;39(3):605-628. doi:10.1002/pam.22201.
6. Cawley J, Frisvold D, Jones D, Lensing C. The Pass-Through of a Tax on Sugar-Sweetened Beverages in Boulder, Colorado. *American Journal of Agricultural Economics*. 2021. doi:10.1111/ajae.12191.
7. Falbe J, Rojas N, Grummon AH, Madsen KA. Higher Retail Prices of Sugar-Sweetened Beverages 3 Months After Implementation of an Excise Tax in Berkeley, California. *Am J Public Health*. 2015;105(11):2194-2201. doi:10.2105/AJPH.2015.302881.
8. Falbe J, Thompson HR, Becker CM, Rojas N, McCulloch CE, Madsen KA. Impact of the Berkeley Excise Tax on Sugar-Sweetened Beverage Consumption. *Am J Public Health*. August 2016:e1-e7. doi:10.2105/AJPH.2016.303362.
9. Falbe J, Lee MM, Kaplan S, Rojas NA, Ortega Hinojosa AM, Madsen KA. Higher Sugar-Sweetened Beverage Retail Prices After Excise Taxes in Oakland and San Francisco. *Am J Public Health*. 2020;110(7):1017-1023. doi:10.2105/AJPH.2020.305602.
10. Jones-Smith JC, Walkinshaw LP, Oddo VM, et al. Impact of a sweetened beverage tax on beverage prices in Seattle, WA. *Economics & Human Biology*. 2020;39:100917. doi:10.1016/j.ehb.2020.100917.
11. Lee MM, Falbe J, Schillinger D, Basu S, McCulloch CE, Madsen KA. Sugar-Sweetened Beverage Consumption 3 Years After the Berkeley, California, Sugar-Sweetened Beverage Tax. *Am J Public Health*. 2019;109(4):637-639. doi:10.2105/AJPH.2019.304971.
12. Powell LM, Leider J. Evaluation of Changes in Beverage Prices and Volume Sold Following the Implementation and Repeal of a Sweetened Beverage Tax in Cook County, Illinois. *JAMA Netw Open*. 2020;3(12):e2031083-10. doi:10.1001/jamanetworkopen.2020.31083.

Numbered References, continued

13. Powell LM, Leider J. The impact of Seattle's Sweetened Beverage Tax on beverage prices and volume sold. *Economics & Human Biology*. 2020;37:100856. doi:10.1016/j.ehb.2020.100856.
14. Powell LM, Leider J, Léger PT. The Impact of a Sweetened Beverage Tax on Beverage Volume Sold in Cook County, Illinois, and Its Border Area. *Ann Intern Med*. 2020;172(6):390–12. doi:10.7326/M19-2961.
15. Powell LM, Leider J, Léger PT. The impact of the Cook County, IL, Sweetened Beverage Tax on beverage prices. *Economics & Human Biology*. 2020;37:100855. doi:10.1016/j.ehb.2020.100855.
16. Roberto CA, Lawman HG, LeVasseur MT, et al. Association of a Beverage Tax on Sugar-Sweetened and Artificially Sweetened Beverages With Changes in Beverage Prices and Sales at Chain Retailers in a Large Urban Setting. *JAMA*. 2019;321(18):1799–12. doi:10.1001/jama.2019.4249.
17. Rojas C, Inquiry EWE. Do Taxes On Soda And Sugary Drinks Work? Scanner Data Evidence From Berkeley And Washington State. *Economic Inquiry*. 2021;59(1):95-118. doi:10.1111/ecin.12957
18. Seiler S, Tuchman A, Yao S. The Impact of Soda Taxes: Pass-Through, Tax Avoidance, and Nutritional Effects. *Journal of Marketing Research*. 2020;36(2):002224372096940–28. doi:10.1177/0022243720969401.
19. Silver LD, Ng SW, Ryan-Ibarra S, et al. Changes in prices, sales, consumer spending, and beverage consumption one year after a tax on sugar-sweetened beverages in Berkeley, California, US: A before-and-after study. *PLoS Med*. 2017;14(4):e1002283. doi:10.1371/journal.pmed.1002283.
20. White J et al. Preliminary data analyses – Oakland and San Francisco.
21. Zhong Y, Auchincloss AH, Lee BK, Kanter GP. The Short-Term Impacts of the Philadelphia Beverage Tax on Beverage Consumption. *American Journal of Preventive Medicine*. 2018;55(1):26-34. doi:10.1016/j.amepre.2018.02.017.
22. Zhong Y, Auchincloss AH, Lee BK, McKenna RM, Langellier BA. Sugar-Sweetened and Diet Beverage Consumption in Philadelphia One Year after the Beverage Tax. *IJERPH*. 2020;17(4):1336–12. doi:10.3390/ijerph17041336.

Additional References

- Altman ET, Madsen KA, Schmidt L. Promoting public awareness of sugar-sweetened beverage taxes: Missed opportunities. 2021; . Int J Environ Res Public Health. 2021;18, 4607. <https://doi.org/10.3390/ijerph18094607>
- Benesch T, Falbe J, Ibarra-Castro A, Madsen KA, Sokal-Gutierrez K. Perceived impact of the Berkeley Soda Tax on beverage selection by parents: A qualitative study. J Family Med Community Health. 2017; 4(4):1116.
- Falbe J, Grummon AH, Rojas N, Ryan-Ibarra S, Silver LD, Madsen KA. Implementation of the First US Sugar-Sweetened Beverage Tax in Berkeley, CA, 2015-2019. Am J Public Health. 2020;110(9):1429-1437. doi:10.2105/AJPH.2020.305795.
- Krieger J, Magee K, Hennings T, Schoof J, Madsen KA. How revenues from sugar-sweetened beverage taxes in the U.S. are being used. Prev Med Reports. 2021; <https://doi.org/10.1016/j.pmedr.2021.101388>.
- Lawman HG, Bleich SN, Yan J, LeVasseur MT, Mitra N, Roberto CA. Unemployment claims in Philadelphia one year after implementation of the sweetened beverage tax. Fu S, ed. PLoS ONE. 2019;14(3):e0213218. doi:10.1371/journal.pone.0213218.
- Ponce J, Yuan H, Schillinger D, et al. Retailer perspectives on sugar-sweetened beverage taxes in the California Bay Area. Prev Med Rep. 2020;19:101129. doi:10.1016/j.pmedr.2020.101129.
- *Sugar-sweetened beverage taxation in the Region of the Americas*. Washington, D.C.: Pan American Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.

Questions

No negative economic impacts from taxes

- Extensive evidence from tobacco taxes: no loss of jobs overall
- No effect on jobs or economy in Mexico after 2 years of sugar tax
- No effect on employment in Philadelphia after 1 year of beverage tax
- Models predict a statewide tax in California would lead to small net job increase (+0.03%)

Money stays in
the economy

Chaloupka F et al. *Annu Rev Public Health*, 2019. Guerrero-López CM et al. *Prev Med*, 2017.
Lawman HG et al. *PLoS One*, 2019. Powell L et al. *Am J Publ Health*, 2014.

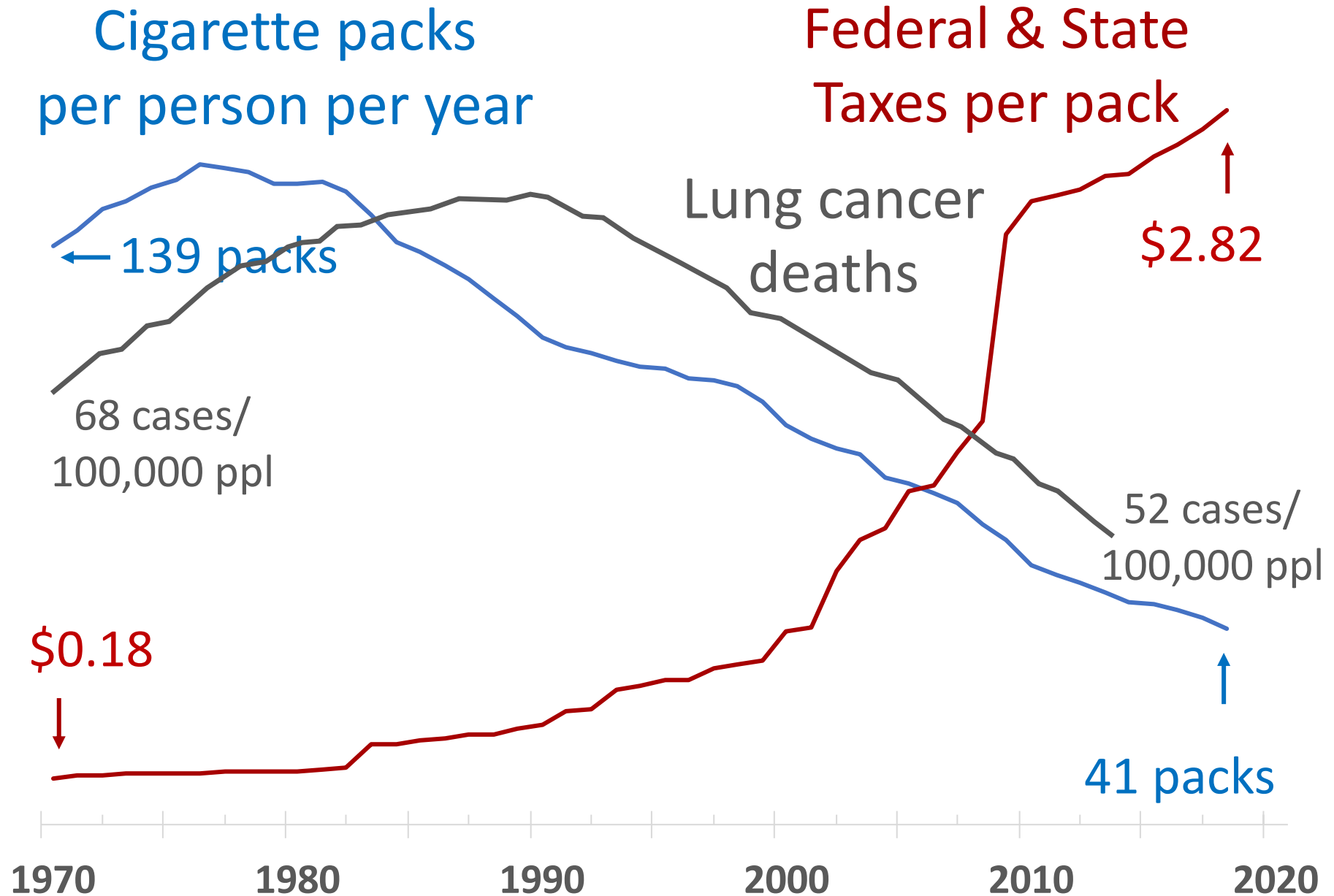
Distributors paying \$134M annually



City	Annual Revenue	Tax (cents/oz)	Population (000's)
Philadelphia	\$77.7 million	1.5 ¢/oz	1,584
Seattle	\$23.1 million	1.75 ¢/oz	754
San Francisco	\$16.1 million	1 ¢/oz	882
Oakland	\$10.2 million	1 ¢/oz	443
Boulder	\$5.0 million	2 ¢/oz	106
Berkeley	\$1.6 million	1 ¢/oz	121
Albany	\$0.3 million	1 ¢/oz	20
Total	\$133.9 million		

Tobacco taxes

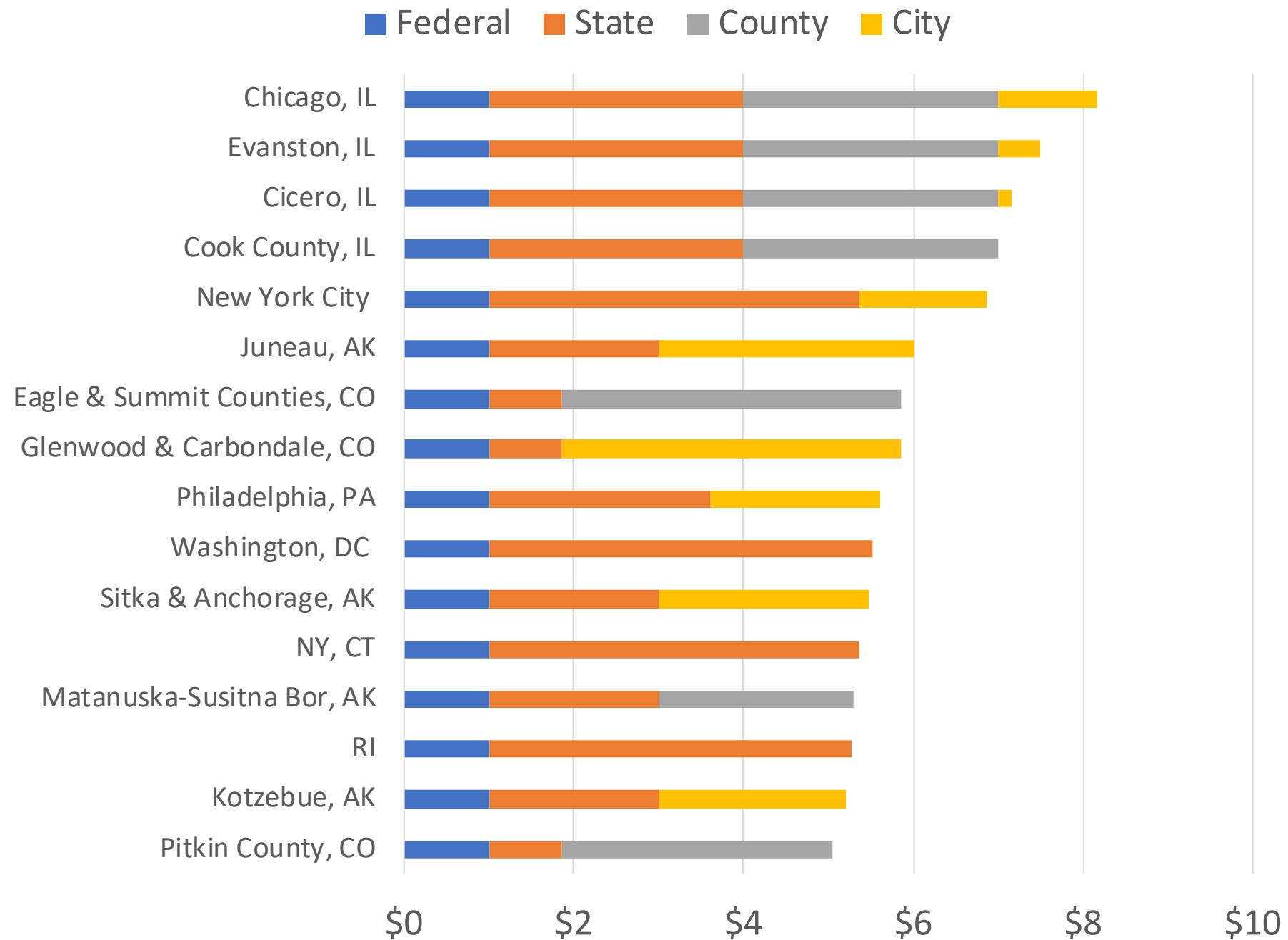
&
Local taxes
&
Smoke-free
restaurants and
workplaces
&
Warning labels
&
Advertising bans



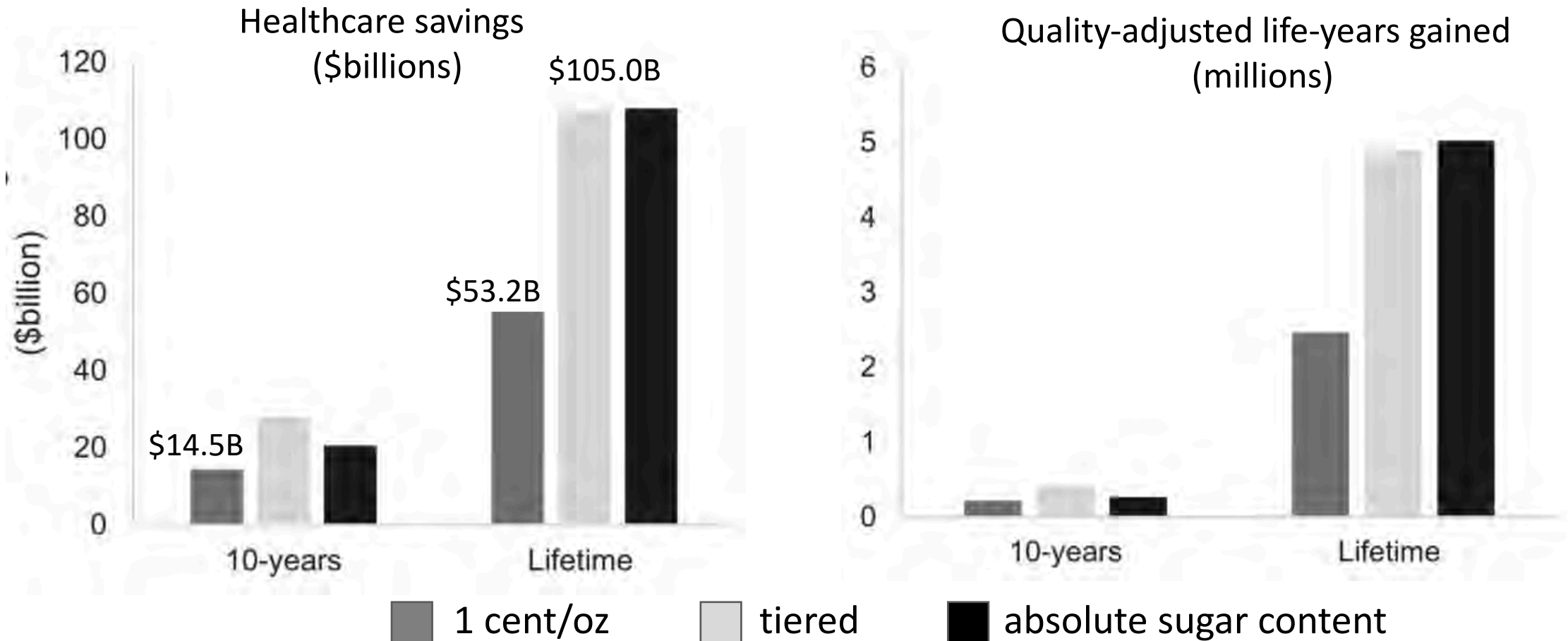
Data from the CDC: Orzechowski and Walker. Tax Burden on Tobacco, 1970-2018.

American Cancer Society: Cancer Facts & Figures 2017.

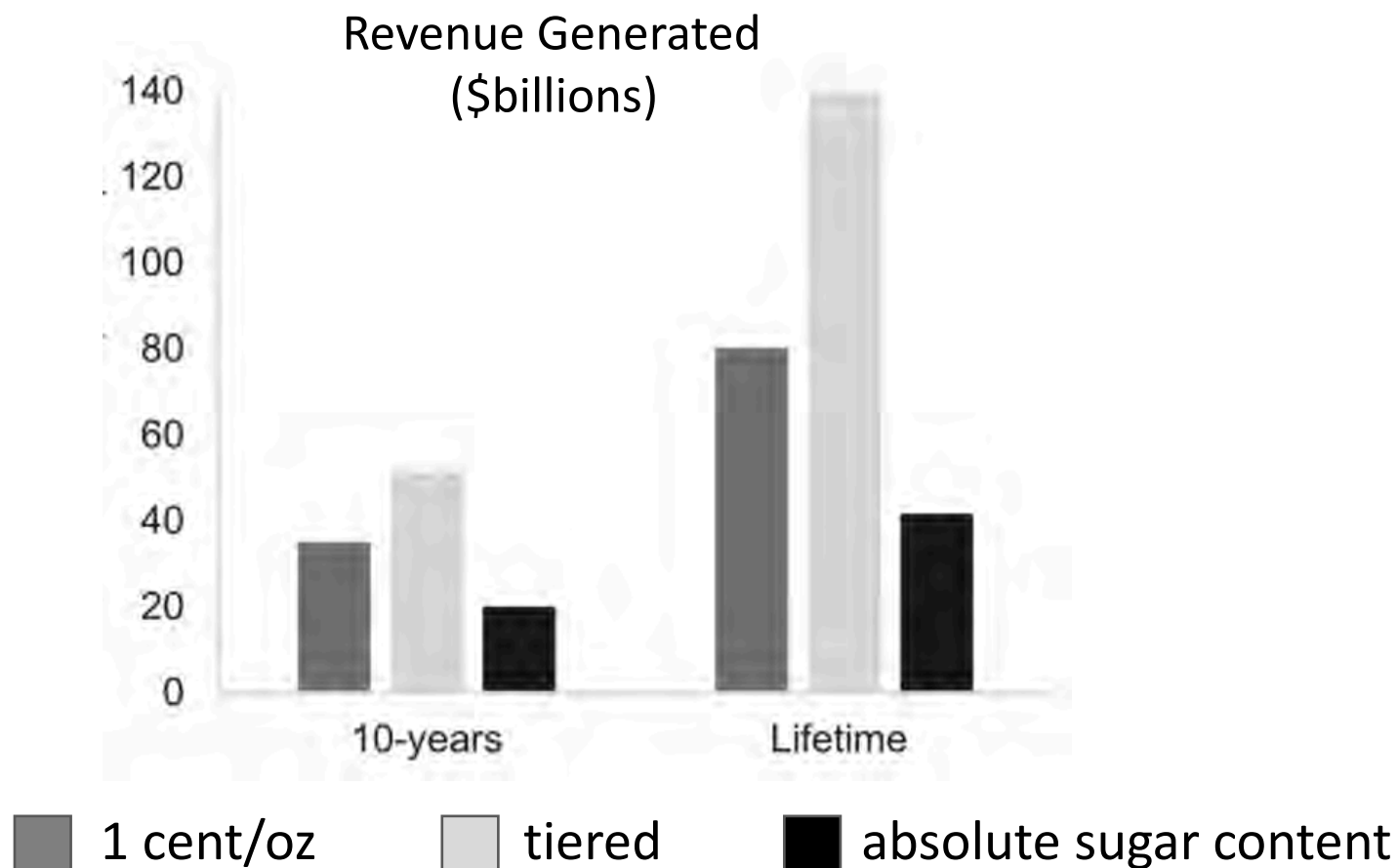
Tobacco Tax example of local flexibility



Healthcare savings & quality-adjusted life-years gained



Revenues from national SSB tax



Health outcomes from 3 types of SSB tax

