

Sugar-Sweetened Beverage Fee: A Model to Address Health Disparities in Hawai‘i

Meghan D. McGurk MPH; Colby R. Takeda MPH, MBA; Jaylen Murakami BS; Trish La Chica MPA; and Jessica Yamauchi MA

Abstract

Sugar-sweetened beverage (SSB) consumption is associated with increased risk of obesity, diabetes, and other chronic diseases. SSB consumption is also a health equity issue, as rates of consumption and related chronic diseases vary by race, ethnicity, and income in Hawai‘i. The COVID-19 pandemic has highlighted the need for greater investment in public health and the well-being of communities experiencing health disparities because individuals with chronic diseases are more likely to develop complications from the virus. It has also created economic hardships for the people of Hawai‘i, especially the state’s most vulnerable populations. Amid this health and economic crisis, an opportunity exists to implement an SSB fee in Hawai‘i. An SSB fee would impose a fee on SSB distributors that would be passed on to consumers in the form of price increases that influence purchasing behavior. Jurisdictions with SSB taxes or fees have seen reductions in SSB purchases and consumption and have generated millions of dollars in revenues to support health initiatives and reduce socioeconomic disparities. Models predict that a \$0.02 SSB fee in Hawai‘i could generate \$60.5 million and significantly reduce healthcare costs and chronic diseases. This commentary will present an SSB fee policy as a viable model for Hawai‘i to reduce SSB consumption, lower chronic disease risks, and generate needed revenues to support health, reduce inequities, and rebuild the state’s economy.

Keywords

sugar-sweetened beverages, sugary drinks, policies, health equity, chronic disease, COVID-19

Abbreviations

COVID-19 = Coronavirus Disease 2019
NH = Native Hawaiian
NHPI = Native Hawaiian and Pacific Islander
PI = Pacific Islander
SNAP = Supplemental Nutrition Assistance Program
SSB = Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSBs) are beverages with added sugars or other caloric sweeteners, such as high fructose corn syrup.¹ SSBs are one of the largest contributors of added sugars to the American diet.² In 2014, American youth consumed 7.3% of their daily calories from SSBs,³ while adults consumed 6.5%.⁴ SSB consumption alone exceeds the United States (US) Dietary Guideline Advisory Committee’s recommendation that no more than 6% of a person’s daily calories should come from added sugars.⁵ SSBs offer calories with little nutritional value⁵ and do not satiate the appetite like food.⁶ Additionally, SSB consumption is associated with increased risk of obesity, diabetes, heart disease, and cancer, some of the leading causes of morbidity and mortality globally.^{7,8}

In Hawai‘i, SSB consumption is a major concern for both its health and economic impacts. A 2012 study found that nearly half of Hawai‘i adolescents surveyed drank SSBs 1 or more times daily, and nearly all drank SSBs at least once weekly.⁹ Among Hawai‘i adults, 12.5% report drinking 1 or more sodas daily.¹⁰ This daily consumption contributes to Hawai‘i’s high overweight and obesity rates for both adults (57.6%)¹¹ and teens (28.4%),¹² which cost the state \$470 million annually in direct healthcare expenses in 2009.¹³ Further, Hawai‘i’s diabetes-related direct healthcare costs were calculated at more than \$1.3 billion in 2017,¹⁴ despite the fact that only about a quarter of Hawai‘i adults reported being diagnosed with diabetes, pre-diabetes, or gestational diabetes.¹⁵ Additionally, there are persistent racial and ethnic disparities in rates of SSB consumption,¹⁰ obesity,¹¹ and other chronic diseases^{16–18} that are of great concern for the state.

SSB Consumption and Health Equity

Native Hawaiian and Pacific Islander (NHPI) adults in Hawai‘i report higher rates of daily SSB consumption (15.8% and 19.9%, respectively),¹⁰ as well as higher obesity rates.¹¹ National data show similar trends; people of underserved communities, specifically black and Hispanic communities, consume SSBs at higher rates than their white and Asian peers.^{3,4} Children in low-income families of all races are more likely to consume SSBs compared to those in high-income families.¹⁹ Additionally, the high prevalence of fast-food chains and lack of fresh produce retailers in low- and middle-income communities have been associated with increased risk of cardiovascular disease.²⁰

Analyses of beverage industry marketing expenses indicate higher investments in low-income communities of color, compounding on the industry’s harmful practices that prioritize marketing and sales over public health.^{21–24} SSB companies also dedicate millions of marketing dollars to minority communities by sponsoring cultural festivals, professional conferences, and athletes and celebrities of color.²⁵ In Hawai‘i, the beverage industry has exploited local culture, portraying SSBs at popular local beaches and framing them as a way to “live Aloha.”²⁶ As a result, SSBs are a normalized part of local culture and are regularly consumed at family gatherings.²⁷

In addition to targeted marketing, NHPI and Filipino adults in Hawai‘i experience other risk factors for chronic disease—overweight/obesity,¹² tobacco use,^{28,29} physical inactivity,³⁰ food and housing insecurity,³¹ and obesogenic neighborhoods³²—at higher rates than many other racial/ethnic groups. These risk

factors contribute to higher levels of chronic disease experienced by these populations. National data show that NHPI adults experience higher rates of heart disease than Asians and higher rates of hypertension than both Asian and white adults.³³ In Hawai‘i, data show that NHPI and Filipino adults have higher rates of diagnosed diabetes than white adults across nearly all age groups.¹⁷ Chronic diseases are also seen at alarming rates among young NHPI and Filipinos.¹⁸ A recent study found that among children ages 5-9 who were hospitalized in Hawai‘i between 2015 and 2016, a greater proportion of those with chronic conditions were NHPI and Filipino than other races/ethnicities.¹⁸ This is significant because chronic diseases are risk factors for hospitalization and severe COVID-19 (i.e., admission to intensive care units, invasive mechanical ventilation, or death) not only for adults,³⁴ but also for children.³⁵ In fact, cases of severe COVID-19 among pediatric patients have been concentrated in youth with underlying conditions.³⁵

The pandemic has further highlighted significant racial and ethnic disparities with health risks related to SSB consumption because vulnerable populations, many of whom have high rates of obesity, diabetes, and/or certain other health conditions, have experienced worsened health outcomes from COVID-19.³⁴ According to the Centers for Disease Control and Prevention, people of color have higher rates of COVID-19 cases,³⁶ hospitalizations,³⁷ and deaths than white individuals.³⁸ Hawai‘i data show similar patterns across racial and ethnic groups, as Pacific Islander and Filipino populations have 27% and 21% of cases but comprise only 4% and 16% of the state’s population, respectively.³⁹ The disproportionate impact of COVID-19 on NHPI and Filipino populations underscores pervasive inequities in the social determinants of health in Hawai‘i, including inequities in access to healthcare, paid sick leave, high-paying jobs, and affordable nutritious foods. These social determinants of health contribute to the high chronic disease rates experienced by these communities.^{40,41}

An SSB Fee: A Promising Solution

Organizations such as the American Academy of Pediatrics⁴² and World Health Organization⁴³ recommend SSB taxes or fees to reduce SSB consumption and related health disparities. SSB taxes or fees are levied on distributors and passed on to consumers through higher prices at the point of sale, where purchasing decisions are made.⁴⁴ SSB taxes and fees are functionally the same, only differing in how they are administered. Although taxes are most common, the bills drafted in Hawai‘i to date have proposed an SSB fee to be administered by the Hawai‘i State Department of Health.⁴⁵

More than 40 countries and 7 US jurisdictions have SSB taxes.⁴⁶ These locations have seen reduced SSB purchases and consumption after tax implementation and have generated millions of dollars to address health and socioeconomic inequities.⁴⁶⁻⁴⁹ Revenues have been used for fresh produce deliveries to low-

income families, school nutrition education programs, diabetes prevention programs, dental care for low-income populations, job readiness training, and more.^{46,49,50} Recently, some of these locations reallocated their funding to specifically address critical needs resulting from COVID-19. San Francisco, California directed \$1.65 million in SSB tax revenues to aid low-income populations facing food insecurity,⁵¹ and Seattle, Washington spent \$5 million to fund grocery vouchers for families enrolled in food assistance programs.⁴⁹

Hawai‘i SSB fee proponents recommend a \$0.02 per ounce fee, which would result in a \$0.24 increase in the purchase price of a 12-ounce SSB and generate an estimated \$60.5 million annually.⁵² This is critical funding that could be used to support public health, reduce inequities, and rebuild Hawai‘i’s economy, which has been crippled during the pandemic. For example, revenues could be used to expand funding for Hawai‘i’s DA BUX Double Up Food Bucks Program, which provides Supplemental Nutrition Assistance Program (SNAP) users with vouchers to double their dollars when purchasing local fresh produce.⁵³ This subsidy offsets the higher costs of fresh produce compared to sugary foods,⁵⁴ incentivizes SNAP users to purchase more fresh produce,⁵⁵ and supports local grocers and farmers.⁵³ Revenues could also be used to improve the quality of school physical education programs, provide preventive dental benefits for adults Med-QUEST clients, and offer job training opportunities for those impacted by COVID-19.

In addition to generating substantial revenues, a \$0.02 per ounce fee in Hawai‘i is projected to save \$59.3 million in healthcare costs over 10 years through anticipated reductions in SSB consumption and the prevention of new cases of obesity and diabetes.⁵⁶ This is an important benefit of the fee, considering the high obesity- and diabetes-related direct healthcare costs facing the state annually.^{13,14} This would also benefit Hawai‘i’s private employers, who are required by the Prepaid Health Care Act to pay at least half of their employees’ health insurance premiums.⁵⁷ Models also project that over the fee’s first year, there would be differential decreases in SSB consumption and childhood obesity by race and ethnicity, with NHPI and Filipino SSB consumption and Native Hawaiian childhood obesity rates decreasing the most.⁵⁶

Despite these benefits, none of the SSB fee bills introduced in Hawai‘i have passed. Arguments against the fee include concerns of job losses in the local beverage industry.⁴⁵ This is a serious concern considering Hawai‘i’s high unemployment rate, which skyrocketed from the pre-pandemic low of 2.4% to 15.1% in September 2020.⁵⁸ However, a recent study following impacts of Philadelphia’s SSB tax showed no significant job losses, neither in key industries that sell SSBs, nor overall unemployment.⁵⁹ Some of the reasons that employment rates are unaffected are that consumers shift purchases to other beverages, such as water or diet drinks,⁶⁰ and revenues that are reinvested in the local community create jobs across multiple sectors.⁵⁹⁻⁶¹

Another opposition argument is that this is a regressive tax, overburdening low-income populations, who will have to spend a larger portion of their income on the additional fee than high-income populations.⁶¹ However, fee supporters argue that these laws are actually progressive because of the disproportionate burdens low-income populations and communities of color experience from targeted marketing by the beverage industry,^{21,22} rates of SSB consumption,^{19,22} and prevalence of SSB-related chronic disease.⁶² Additionally, models predict that these groups will see the greatest health gains from an SSB fee.⁵⁶ Although health impact data from SSB taxes are not yet available, examination of purchases in Mexico before and after the tax showed reductions in SSB purchases across all socioeconomic status groups, with the largest reductions among the lowest socioeconomic group.⁶³ Similarly, intercept surveys conducted in low-income communities in Berkeley, California showed self-reported consumption decreased by 52% after the tax.⁴⁸ Additionally, utilizing SSB fee revenue to reduce health inequities, with feedback from NHPI, Filipino, and low-income communities can amplify benefits to these communities.⁴⁶

The economic and health benefits of an SSB fee are significant. As Hawai‘i braces for extreme budget shortfalls and a prolonged economic recovery,⁶⁴ lawmakers have an opportunity to implement an SSB fee to reduce SSB consumption and chronic disease risks, significantly save on healthcare costs, and generate revenue to reduce health and socioeconomic inequities during austere post-COVID-19 times. The challenge for lawmakers will be ensuring funds are used to these ends and not solely used to fill budget gaps that perpetuate the status quo. As COVID-19 has so somberly emphasized, the state’s current systems neglect our most vulnerable residents.^{40,65,66} Furthermore, public support for an SSB fee hinges on how the revenues would be used. Hawai‘i Public Health Institute’s public polling found that 81% of people surveyed would strongly or somewhat support a fee if the revenues were earmarked for health improvement programs for Hawai‘i’s keiki.⁶⁷ However, if the use of the funds was unspecified, support dropped to 62%. This is critical for Hawai‘i lawmakers to recognize, as without public support, an SSB tax can be repealed soon after enactment, as occurred in Cook County, Illinois.⁶⁸ Examination of the repeal showed that a key issue was that the tax was framed as being used to close budget gaps and that none of the funds were explicitly dedicated to public health.⁶⁸ Alternatively, successful taxes in other jurisdictions have established community advisory boards to ensure funds are used for public interest projects to reduce health disparities,⁴⁶ and thus have maintained public support and remained in effect.

As lawmakers consider an SSB fee, they should also draw lessons from tobacco taxes. Hawai‘i’s tobacco prevention and control efforts, including the tobacco tax, have successfully reduced smoking rates and cigarette sales.⁶⁹ This is a public health triumph, but has led to concerns about decreasing tax revenues and sustaining efforts funded through them. Contrary to opposition arguments, tobacco taxes are actually a stable form of revenue for states’ public health efforts and sharp declines in revenue from year-to-year are uncommon.⁷⁰ Also, states that have substantially increased tobacco taxes over time have generated revenues that exceed the losses from decreased sales.⁷⁰ Similarly, if the SSB fee is effective, consumption, the associated health consequences, and revenues will decrease over time. Lawmakers should heed these lessons, understanding that while SSB consumption will decline, fee increases can be used to maintain revenue streams and fee effectiveness. Additionally, any declines in tax revenues will be offset by reduced health care costs and improved health equity for Hawai‘i’s vulnerable populations.

Conclusion

The links between SSB consumption and chronic diseases are well documented, as are the disparate rates of chronic disease by race, ethnicity, and income in Hawai‘i. As the State of Hawai‘i rebuilds its economy and emerges from this pandemic, it has the opportunity to enact an SSB fee to reduce SSB consumption, prevent chronic disease, generate revenues to support health, and address the root causes of Hawai‘i’s disparities.

Conflicts of Interest

No conflicts of interest are reported by the authors of this paper.

Disclosures

The University of Hawai‘i at Mānoa’s Office of Public Health studies and the Hawai‘i Public Health Institute receive funding from the Hawai‘i State Department of Health’s Chronic Disease Prevention and Health Promotion Division to work on Physical Activity and Nutrition Policies. The Hawai‘i Public Health Institute also received grant funding in 2021 from a private funder to work on an SSB fee. Mr. Takeda is an employee of Sharecare, Inc., which receives funding from HMSA to work on Blue Zones Project - Hawai‘i.

Authors’ Affiliations:

- Office of Public Health Studies, University of Hawai‘i at Mānoa, Honolulu, HI (MDM)
- Blue Zones Project - Hawai‘i, Honolulu, HI (CRT)
- Hawai‘i Public Health Institute, Honolulu, HI (JM, JY)
- AlohaCare, Honolulu, HI (TLC)

Correspondence to:

Meghan D. McGurk MPH; Office of Public Health Studies, University of Hawai‘i at Mānoa, Honolulu, HI; Email: mcgurkm@hawaii.edu

References

- Centers for Disease Control and Prevention. Sugar sweetened beverage intake. Centers for Disease Control and Prevention. Published November 18, 2020. Accessed December 9, 2020. <https://www.cdc.gov/nutrition/data-statistics/sugar-sweetened-beverages-intake.html>
- U.S. Department of Health and Human Services. *2015-2020 Dietary guidelines for Americans*. 8th Ed. Published online December 2015:144.
- Rosinger A, Park S. Sugar-sweetened beverage consumption among U.S. youth, 2011–2014. NCHS data brief, no 271. Hyattsville, MD: National Center for Health Statistics. 2017.
- Rosinger A, Park S. Sugar-sweetened beverage consumption among U.S. adults, 2011–2014. NCHS data brief, no 270. Hyattsville, MD: National Center for Health Statistics. 2017.
- Dietary Guidelines Advisory Committee. *Scientific report of the 2020 Dietary Guidelines Advisory Committee: Advisory report to the Secretary of Agriculture and the Secretary of Health and Human Services*. U.S. Department of Agriculture, Agricultural Research Service; 2020. Accessed December 30, 2020. https://www.dietaryguidelines.gov/sites/default/files/2020-07/ScientificReport_of_the_2020DietaryGuidelinesAdvisoryCommittee_first-print.pdf
- Pan A, Hu FB. Effects of carbohydrates on satiety: differences between liquid and solid food. *Curr Opin Clin Nutr Metab Care*. 2011;14(4):385-390. doi:10.1097/MCO.0b013e328346df36
- Malik VS, Hu FB. Sugar-sweetened beverages and cardiometabolic health: An update of the evidence. *Nutrients*. 2019;11(8):1840. doi:10.3390/nu11081840
- Singh GM, Micha R, Khatibzadeh S, Lim S, Ezzati M, Mozaffarian D. Estimated global regional, and national disease burdens related to sugar-sweetened beverage consumption in 2010. *Circulation*. 2015;132(8):639-666. doi:10.1161/CIRCULATIONAHA.114.010636
- State of Hawaii. State launches new teen-focused obesity prevention campaign. Published February 14, 2013. Accessed December 30, 2020. <https://health.hawaii.gov/healthy-hawaii/files/2013/08/Press-Release-State-Launches-New-Teen-Focused-Obesity-Prevention-Campaign.pdf>
- Hawaii State Department of Health, Hawaii Health Data Warehouse. Hawaii's Behavioral Risk Factor Surveillance System (BRFSS) data - daily frequency of soda consumption (categorized), 2017. Published 2020. Accessed December 11, 2020. http://ibis.hhdw.org/ibisph-view/query/result/brfss/SodaDailyCat/SodaDailyCatCrude11_.html
- Hawaii State Department of Health, Hawaii Health Data Warehouse. Hawaii's Behavioral Risk Factor Surveillance System (BRFSS) Data - BMI - overweight or obese, Age Adjusted, 2011–2018. Published 2020. Accessed December 28, 2020. http://ibis.hhdw.org/ibisph-view/query/result/brfss/BMIOverWtOb/BMIOverWtObAA11_.html
- Hawaii State Department of Health, Hawaii Health Data Warehouse, 2017. Hawaii's Youth Risk Behavior Survey (YRBS) Data - Overweight or obese (>=85%ile BMI for age & sex), High Schools, State-level; 2017. Published 2017. Accessed December 13, 2020. http://ibis.hhdw.org/ibisph-view/query/result/yrebs/OvrWgtObese/OvrWgtObese_HS_ST.html
- Trogdon JG, Finkelstein EA, Feagan CW, Cohen JW. State- and payer-specific estimates of annual medical expenditures attributable to obesity. *Obesity*. 2012;20(1):214-220. doi:https://doi.org/10.1038/oby.2011.169
- Dall TM, Yang W, Gillespie K, et al. The economic burden of elevated blood glucose levels in 2017: diagnosed and undiagnosed diabetes, gestational diabetes mellitus, and prediabetes. *Diabetes Care*. 2019;42(9):1661-1668. doi:10.2337/dc18-1226
- Hawaii State Department of Health, Hawaii Health Data Warehouse. Hawaii-IBIS - Hawaii's Behavioral Risk Factor Surveillance System (BRFSS) data - diabetes - prevalence (diabetes, pre-diabetes, gestational diabetes, none), 2016. Published 2016. Accessed January 4, 2021. http://ibis.hhdw.org/ibisph-view/query/result/brfss/DXDiabCat/DXDiabCatCrude11_.html
- Galinsky AM, Zelaya CE, Simile C, Barnes PM. *Selected Health Conditions among Native Hawaiian and Pacific Islander Adults: United States, 2014*. National Center for Health Statistics; 2017.
- Uchima O, Wu YY, Browne C, Braun KL. Disparities in diabetes prevalence among Native Hawaiians/Other Pacific Islanders and Asians in Hawaii. *Prev Chronic Dis*. 2019;16. doi:10.5888/pcd16.180187
- Sentell T, Choi, SY, Ching L, Quensell, M, Kelli'ioa LB, Corriveau E, Pirkle C. Prevalence of selected chronic conditions among children, adolescents, and young adults in acute care settings in Hawaii. *Prev Chronic Dis*. 2020;17. doi:10.5888/pcd17.190448
- Han E, Powell LM. Consumption patterns of sugar-sweetened beverages in the United States. *J Acad Nutr Diet*. 2013;113(1):43-53. doi:10.1016/j.jand.2012.09.016
- Gersh BJ, Silva K, Mayoshi BM, Yusef S. The epidemic of cardiovascular disease in the developing world: Global implications. *Eur Heart J*. 2010;31(6):642-648. doi:10.1093/eurheartj/ehq030
- Harris JL, Shehan C, Gross R, et al. *Food advertising targeted to Hispanic and Black youth: Contributing to health disparities*. Rudd Center for Food Policy and Obesity, African American Collaborative Obesity Research Network, and Salud America!; 2015. http://www.uconnruddcenter.org/files/Pdfs/272-7%20%20Rudd_Targeted%20Marketing%20Report_Release_081115%5B1%5D.pdf
- Harris JL, Fleming-Milici F, Kibwana-Jaff A, Phaneut L. *Sugary drink FACTS 2020*. Rudd Center for Food Policy and Obesity; 2020. http://uconnruddcenter.org/files/Pdfs/Sugary_Drink_FACTS_Full%20Report.pdf
- Yancey AK, Cole BL, Brown R, et al. A cross-sectional prevalence study of ethnically targeted and general audience outdoor obesity-related advertising. *Milbank Q*. 2009;87(1):155-184. doi:10.1111/j.1468-0009.2009.00551.x
- Harris JL, Schwartz MB, LoDolce M, et al. *Sugary drink FACTS 2014*. Rudd Center for Food Policy and Obesity; 2014. http://www.sugarydrinkfacts.org/resources/SugaryDrinkFACTS_Report.pdf
- Nestle M. *Soda politics: Taking on Big Soda (and winning)*. 1st ed. Oxford University Press; 2015.
- 6 Pillars Marketing. Pepsi: Beverage and Experiential Marketing. 6 Pillars Marketing. Accessed January 6, 2021. <https://6pillarsmarketing.com/case-studies/pepsi/>
- Hawaiian Sun. Hawaiian Sun. Published 2020. Accessed January 6, 2021. <https://www.hawaiiansunproducts.com>
- Corpus KA, Dela Cruz MRI. Rates of current tobacco and electronic smoking device use among Filipinos in Hawaii. *Hawaii J Health Soc Welf*. 2019;78(12):6.
- Hawaii State Department of Health, Hawaii Health Data Warehouse. Hawaii-IBIS - Hawaii's Behavioral Risk Factor Surveillance System (BRFSS) data - cigarettes - current smoker, age adjusted, 2011-2018. Published 2018. Accessed January 4, 2021. http://ibis.hhdw.org/ibisph-view/query/result/brfss/SmokeCurrent/SmokeCurrentAA11_.html
- Hawaii State Department of Health, Hawaii Health Data Warehouse. Hawaii-IBIS - Hawaii's Behavioral Risk Factor Surveillance System (BRFSS) data - leisure time physical activity, age adjusted, 2011-2018. Published 2018. Accessed January 4, 2021. http://ibis.hhdw.org/ibisph-view/query/result/brfss/PhysInact/PhysInactAA11_.html
- Stuppelbeen DA. Housing and food insecurity and chronic disease among three racial groups in Hawaii. *Prev Chronic Dis*. 2019;16. doi:10.5888/pcd16.180311
- Mau MK, Wong KN, Efrid J, West M, Saito EP, Maddock J. Environmental factors of obesity in communities with Native Hawaiians. *Hawaii Med J*. 2008;67(9):233-236.
- Galinsky AM, Zelaya CE, Simile C, Barnes PM. *Health conditions and behaviors of Native Hawaiian and Pacific Islander persons in the United States, 2014: Data from the Native Hawaiian and Pacific Islander National Health Interview Survey*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2017.
- Centers for Disease Control and Prevention (CDC). COVID-19 and your health. CDC. Published February 11, 2020. Accessed December 10, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>
- Preston LE, Chevinsky JR, Kompaniyets L, et al. Characteristics and Disease Severity of US Children and Adolescents Diagnosed With COVID-19. *JAMA Netw Open*. 2021;4(4):e215298. doi:10.1001/jamanetworkopen.2021.5298
- Centers for Disease Control and Prevention. COVID-19 racial and ethnic health disparities: Disparities in COVID-19 illness. Centers for Disease Control and Prevention: COVID-19. Published December 10, 2020. Accessed December 29, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/increased-risk-illness.html>
- Centers for Disease Control and Prevention. COVID-19 COVID-19 racial and ethnic health disparities: Disparities in COVID-19-associated hospitalizations. Centers for Disease Control and Prevention: COVID-19. Published April 30, 2020. Accessed December 29, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/disparities-hospitalization.html>
- Centers for Disease Control and Prevention. COVID-19 COVID-19 hospitalizations and death by race/ethnicity. Centers for Disease Control and Prevention: COVID-19. Published November 30, 2020. Accessed December 29, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>
- State of Hawaii Department of Health, Disease Outbreak Division. Race of COVID-19 cases, Hawaii 2020. Published December 7, 2020. Accessed December 10, 2020. <https://health.hawaii.gov/coronavirusdiseases2019/what-you-should-know/current-situation-in-hawaii/>
- Kaholokula JK, Palafox N, EDD S-AD. COVID-19 Special Column: COVID-19 hits Native Hawaiian and Pacific Islander communities the hardest. *Hawaii J Health Soc Welf*. 2020;79(5):4.
- Yamada S. Let's Call COVID-19 A Syndemic. *Honolulu Civil Beat*. <https://www.civilbeat.org/2020/10/lets-call-covid-19-a-syndemic/>. Published October 25, 2020. Accessed December 28, 2020.
- Muth ND, Dietz WH, Magge SN, et al. Public policies to reduce sugary drink consumption in children and adolescents. *Pediatrics*. 2019;143(4). doi:10.1542/peds.2019-0282
- World Health Organization. *Taxes on sugary drinks: Why do it?*; 2017. Accessed December 6, 2020. <https://apps.who.int/iris/bitstream/handle/10665/260253/WHO-NMH-PND-16.5Rev.1-eng.pdf;jsessionid=729A746F13A3A2D0E9D6E13E16C998C5?sequence=1>
- 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*. 2016;106(10):1865-1871. doi:10.2105/AJPH.2016.303362
- Choy L, Cruz MRD, Hagiwara M, et al. Insights in public health: Taxing Sugar sweetened beverages to improve public health: Policy action in Hawaii. Doctoral Health Policy Seminar, Spring 2013. *Hawaii J Med Public Health*. 2013;72(8):286.
- Bennet S, Draper N, Farnsworth I, McBride F. *Bay Area sugar-sweetened beverage taxes: An evaluation of community investments*; 2019. Accessed November 19, 2020. https://food.berkeley.edu/wp-content/uploads/2019/05/GSSP-Soda-Tax-Evaluation-Final-Draft_withdate.pdf
- 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
- 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
- Yan K. COVID-19 Relief in Seattle will be funded by soda tax revenues. The diaTribe Foundation website. Published online March 23, 2020. Accessed September 28, 2020. <https://diatribe.org/covid-19-relief-seattle-will-be-funded-soda-tax-revenues>
- Lin S, Fitts E. Soda tax update: Where does the money go? The diaTribe Foundation website. Published November 15, 2019. Accessed September 28, 2020. <https://diatribe.org/foundation/about-us/dialogue/soda-tax-update-where-does-money-go>
- Bay City News. \$1.65M of SF City soda tax proceeds directed to feed people hardest hit by COVID-19. NBC Bay Area. Published June 13, 2020. Accessed September 28, 2020. <https://www.nbcbayarea.com/news/local/san-francisco/1-65m-of-sf-city-soda-tax-proceeds-directed-to-feed-people-hardest-hit-by-covid-19/2308918/>
- Revenue Calculator for Sugary Drink Taxes - UConn Rudd Center for Food Policy and Obesity. Accessed June 23, 2020. <http://www.uconnruddcenter.org/revenue-calculator-for-sugary-drink-taxes>
- How It Works. DA BUX Double Up Food Bucks. Accessed December 28, 2020. <https://dabux.org/how-it-works>

54. Pomeranz JL. Advanced policy options to regulate sugar-sweetened beverages to support public health. *J Public Health Policy*. 2012;33(1):75-88. doi:10.1057/jphp.2011.46
55. Steele-Adjonon M, Weatherspoon D. Double Up Food Bucks program effects on SNAP recipients' fruit and vegetable purchases. *BMC Public Health*. 2017;17(1):946. doi:10.1186/s12889-017-4942-z
56. Irvin L, Inoue K, Ching L, et al. Harvard CHOICES Project. Report: Hawai'i sugary drink fee. Published 2021. Accessed March 12, 2021. <https://choicesproject.org/publications/report-hawaii-sugary-drink-fee/>.
57. State of Hawai'i Disability Compensation Division. About Prepaid Health Care. State of Hawai'i Disability Compensation Division. Published 2020. Accessed December 30, 2020. <http://labor.hawaii.gov/dcd/about-phc/>
58. Department of Labor and Industrial Relations. *Hawai'i's Unemployment Rate at 15.1 Percent in September*.; 2020:7. Accessed January 6, 2020. <https://labor.hawaii.gov/wp-content/uploads/2020/10/20201016Sept-UI-Rate-PR.pdf>
59. Marinello S, Leider J, Pugach O, Powell LM. The impact of the Philadelphia beverage tax on employment: A synthetic control analysis. *Econ Hum Biol*. 2021;40:100939. doi:10.1016/j.ehb.2020.100939
60. Chaloupka FJ, Powell LM, Warner KE. The use of excise taxes to reduce tobacco, alcohol, and sugary beverage consumption. *Annu Rev Public Health*. 2019;40(1):187-201. doi:10.1146/annurev-publhealth-040218-043816
61. Falbe J. The ethics of excise taxes on sugar-sweetened beverages. *Physiol Behav*. 2020;225:113105. doi:10.1016/j.physbeh.2020.113105
62. Pobutsky A, Bradbury E, Wong Tomiyasu D. *Chronic disease disparities report 2011: Social determinants*. Hawai'i State Department of Health Chronic Disease Management and Control Branch; 2011. Accessed January 4, 2021. https://health.hawaii.gov/chronic-disease/files/2013/12/CD_BurdenReport_FINAL.pdf
63. Colchero MA, Rivera-Dommarco J, Popkin BM, Ng SW. In Mexico, evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. *Health Aff* . 2017;36(3):564-571. doi:10.1377/hlthaff.2016.1231
64. Dayton K. Hawai'i governor to furlough state workers beginning in January. *Honolulu Civil Beat*. Published December 9, 2020. Accessed December 9, 2020. <https://www.civilbeat.org/2020/12/hawaii-governor-to-furlough-state-workers-beginning-in-january/>
65. Cockett-Nagamine K. COVID magnifies health disparities for Micronesians. *Honolulu Civil Beat*. Published September 4, 2020. Accessed December 6, 2020. <https://www.civilbeat.org/2020/09/covid-magnifies-health-disparities-for-micronesians/>
66. Kawano L. Pacific Islanders say they're being ignored by state in 'war' against coronavirus. <https://www.hawaiinewsnow.com>. Published August 7, 2020. Accessed December 6, 2020. <https://www.hawaiinewsnow.com/2020/08/08/pacific-islanders-say-theyre-being-ignored-by-state-war-against-spread-coronavirus/>
67. Ward Research Incorporated. 2020 Healthy Eating and Active Living policies survey. Published online December 2020.
68. Chriqui JF, Sansone CN, Powell LM. The sweetened beverage tax in Cook County, Illinois: Lessons from a failed effort. *Am J Public Health*. 2020;110(7):1009-1016. doi:10.2105/AJPH.2020.305640
69. United States Surgeon General. The Health Consequences of Smoking -- 50 Years of progress: A Report of the Surgeon General: (510072014-001). Published online 2014. doi:10.1037/e510072014-001
70. Boonn A. Tobacco tax increases are a reliable source of substantial new state revenue. Published online April 20, 2017. Accessed April 5, 2021. <https://www.tobaccofreekids.org/assets/factsheets/0303.pdf>
71. Boonn A. Raising state cigarette taxes always increases state revenues (and always reduces smoking). Published online January 19, 2021. Accessed April 5, 2021. <https://www.tobaccofreekids.org/assets/factsheets/0098.pdf>