

INTERIM REPORT ON BASELINE CHARACTERISTICS OF PATIENT POPULATIONS OF ADULTS AND YOUTH INCLUDED IN SEATTLE SWEETENED BEVERAGE TAX BODY MASS INDEX (BMI) STUDY

OBJECTIVE

To provide an interim report of baseline characteristics for the adults and youth included in the datasets used to study the impact of the Sweetened Beverage Tax on adult and youth weight outcomes, as measured by body mass index (BMI).

METHODS

To evaluate the association between the Seattle Sweetened Beverage Tax (SBT) and weight outcomes, we obtained medical record datasets from a subset of health systems serving Seattle and the Puget Sound area. We developed and applied inclusion and exclusion criteria to the datasets before combining datasets from two sources of electronic health records: Kaiser Permanente Washington Health System and Seattle Children's Odessa Brown Children's Clinic. The final adult medical record sample included patients from Kaiser Permanente Washington Health System alone; the final child medical record sample included patients from both the Kaiser Permanente Washington Health System and Seattle Children's Odessa Brown Children's Clinic.

INCLUSION/EXCLUSION CRITERIA

Age and timeframe. Age 2-65 years old at any time between 1/1/2014 and 12/31/2019 ("the study period").

Sex. Remove patients with sex=U (Sex equals Unknown) due to very small numbers.

Observations. Have at least one height or weight measure in the EMR during the study period in the data set before and after the tax.

At least one primary care visit within that health system. From each health system, limit to people who get their primary care at that health system.

Geography. Both the Kaiser Permanente Washington Health System and Seattle Children's Odessa Brown Children's Clinic samples are limited to people who live in King, Snohomish, or Pierce counties who have at least one encounter during the study period. Exclude people not in urbanized areas within these counties, or in a census tract that straddles two urbanized areas.

Bariatric surgery. Exclude all observations from adults who have bariatric surgery during the study period, or one year prior.

Pregnancy. Exclude observations from individuals taken during nine months of pregnancy and three months afterwards.

Movers. Exclude people who move between Seattle and the comparison area during the study period.

Implausible values of BMI and BMI change. Remove observations from adults with an implausible height, weight, or BMI level (plausible between 50-700 lbs., between 48-84 inches, between 15-90 kg/m²). For the child sample, remove individuals whose BMI z-score was <-5 or >+8, which has been identified by the Centers for Disease Control and Prevention as likely to be implausible or erroneous, and, in our 'first difference model,' individuals with a very large change in BMI corresponding to the 1st and 99th percentile of the distribution (<-81 and >95 percentage point change).

Implausible values of other variables. Examine variable distributions to identify potentially implausible values in the data cleaning process and document rules we decide upon for making the determination of implausible.

Cancer. Exclude all observations from adults who have had a cancer diagnosis during the study period, or one year prior.

BASELINE CHARACTERISTICS OF FINAL STUDY SAMPLES

TABLE 1: ADULTS, KAISER PERMANENTE WASHINGTON HEALTH SYSTEM. CHARACTERISTICS OF PATIENTS RESIDING IN SEATTLE AND THE COMPARISON AREA, FINAL UNWEIGHTED ANALYTIC SAMPLE (N=98,787)

CHARACTERISTICS	UNWEIGHTED	
	SEATTLE	COMPARISON
	PERCENT (SE)	
SEX		
FEMALE	60.7% (0.3%)	61.3% (0.2%)
MALE	39.3% (0.3%)	38.7% (0.2%)
AGE		
18-29	19.9% (0.3%)	18.4% (0.1%)
30-39	24.4% (0.3%)	18.9% (0.1%)
40-49	22.2% (0.3%)	23.4% (0.2%)
50-59	25.6% (0.3%)	31.2% (0.2%)
60-65	7.9% (0.2%)	8.1% (0.1%)
RACIAL AND ETHNIC IDENTITY		
HISPANIC	5.8% (0.2%)	7.0% (0.1%)
NON-HISPANIC, AMERICAN INDIAN/ALASKAN NATIVE	0.5% (0.0%)	0.6% (0.0%)
NON-HISPANIC, ASIAN	12.4% (0.2%)	13.9% (0.1%)
NON-HISPANIC, BLACK, OR AFRICAN AMERICAN	6.8% (0.2%)	7.0% (0.1%)
NON-HISPANIC, MORE THAN ONE RACE	3.0% (0.1%)	3.3% (0.1%)
NON-HISPANIC, NATIVE HAWAIIAN, OR OTHER PACIFIC ISLANDER	0.5% (0.0%)	1.4% (0.0%)
NON-HISPANIC, OTHER	1.7% (0.1%)	1.7% (0.0%)
NON-HISPANIC, UNKNOWN, OR NOT REPORTED	3.3% (0.1%)	3.1% (0.1%)
NON-HISPANIC, WHITE	66.0% (0.3%)	61.9% (0.2%)
CENSUS TRACT RACE/ETHNICITY		
TRACT % WHITE	64.8% (0.1%)	64.3% (0.1%)
TRACT % BLACK	7.9% (0.1%)	5.6% (0.0%)
TRACT % AMERICAN INDIAN/ALASKAN NATIVE	0.5% (0.0%)	0.8% (0.0%)
TRACT % ASIAN	14.2% (0.1%)	12.4% (0.0%)

TRACT % NATIVE HAWAIIAN/OTHER PACIFIC ISLANDER	0.5% (0.0%)	1.0% (0.0%)
TRACT % OTHER RACIAL GROUP	0.2% (0.0%)	0.2% (0.0%)
TRACT % HISPANIC	6.7% (0.0%)	10.4% (0.0%)
TRACT % TWO OR MORE RACIAL GROUPS	5.2% (0.0%)	5.3% (0.0%)

CENSUS TRACT CHARACTERISTICS

TRACT DENSITY	11.2 (0.1)	4.0 (0.0)
TRACT % LIVING IN POVERTY	12.9% (0.1%)	11.2% (0.0%)
TRACT % OF PEOPLE WHO MOVED IN LAST YEAR	21.2% (0.1%)	16.7% (0.0%)
TRACT % OF PEOPLE WITH COLLEGE OR MORE	57.8% (0.1%)	33.6% (0.1%)

INSURANCE TYPE

COMMERCIAL INSURANCE	80.2% (0.3%)	84.1% (0.1%)
MEDICARE	1.2% (0.1%)	1.9% (0.1%)
MEDICAID	2.9% (0.1%)	3.6% (0.1%)
OTHER INSURANCE	38.1% (0.3%)	36.3 (0.2%)

BASELINE BMI

BASELINE BMI (KG/M ²)	27.8 (0.0)	29.4 (0.0)
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TABLE 2: YOUTH, KAISER PERMANENTE WASHINGTON HEALTH SYSTEM & SEATTLE CHILDREN'S ODESSA BROWN CHILDREN'S CLINIC. CHARACTERISTICS OF YOUTH PATIENTS RESIDING IN SEATTLE AND THE COMPARISON AREA, FINAL UNWEIGHTED ANALYTIC SAMPLE (N=24,148)

	SEATTLE UNWEIGHTED	COMPARISON UNWEIGHTED
	N=7,088	N=17,060
	% OR MEAN (SE)	
SEX		
FEMALE	49.10 (0.583)	48.58 (0.374)
AGE		
2-5 YEARS OLD	47.18 (0.582)	42.21 (0.369)
6-9 YEARS OLD	24.69 (0.503)	25.64 (0.326)
10-13 YEARS OLD	23.63 (0.495)	27.49 (0.334)
14-18 YEARS OLD	4.498 (0.242)	4.660 (0.158)
RACIAL AND ETHNIC IDENTITY		
HISPANIC	10.12 (0.352)	10.92 (0.233)

NON-HISPANIC, AMERICAN INDIAN/ALASKAN NATIVE	0.285 (0.0622)	0.397 (0.0470)
NON-HISPANIC, ASIAN	10.63 (0.359)	13.59 (0.256)
NON-HISPANIC, BLACK, OR AFRICAN AMERICAN	17.01 (0.438)	9.633 (0.221)
NON-HISPANIC, MORE THAN ONE RACE	8.058 (0.317)	11.17 (0.235)
NON-HISPANIC, NATIVE HAWAIIAN, OR OTHER PACIFIC ISLANDER	0.761 (0.101)	1.263 (0.0835)
NON-HISPANIC, OTHER	7.121 (0.300)	5.677 (0.173)
NON-HISPANIC, WHITE	46.01 (0.581)	47.35 (0.373)

PEDIATRIC MEDICAL COMPLEXITY

NON-CHRONIC	84.01 (0.427)	93.13 (0.189)
NON-COMPLEX CHRONIC	25.86 (0.510)	33.47 (0.353)
COMPLEX CHRONIC	7.91 (0.315)	10.52 (0.229)

INSURANCE TYPE

COMMERCIAL	55.62 (0.579)	73.17 (0.331)
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CENSUS TRACT RACE/ETHNICITY

TRACT % HISPANIC	7.808 (0.0765)	10.16 (0.0545)
TRACT % AMERICAN INDIAN/ALASKAN NATIVE	0.525 (0.00853)	0.721 (0.0100)
TRACT % ASIAN	16.66 (0.157)	13.12 (0.0723)
TRACT % BLACK	10.90 (0.124)	5.607 (0.0434)
TRACT % TWO OR MORE RACIAL GROUPS	5.444 (0.0282)	5.374 (0.0206)
TRACT % NATIVE HAWAIIAN/OTHER PACIFIC ISLANDER	0.653 (0.0172)	0.964 (0.0134)
TRACT % OTHER RACIAL GROUP	0.160 (0.00486)	0.169 (0.00313)

CENSUS TRACT CHARACTERISTICS

TRACT % WHITE	57.85 (0.276)	63.89 (0.122)
TRACT DENSITY	9,043.44 (56.72)	3,916.22 (17.21)
TRACT % LIVING IN POVERTY	13.95 (0.107)	10.63 (0.0550)
TRACT % OF PEOPLE WHO MOVED IN LAST YEAR	18.35 (0.0953)	16.47 (0.0535)
TRACT % OF PEOPLE WITH COLLEGE OR MORE	52.14 (0.221)	34.84 (0.131)

TABLE 3: YOUTH BMI METRICS FOR SEATTLE AND COMPARISON AREA

	SEATTLE	COMPARISON
	MEAN (SE)	
	OVERALL	
OBSERVATIONS	62,390	157,954
BMI % 95TH	83.8 (0.06)	86.1 (0.04)
BMI	18.3 (0.02)	19.2 (0.01)
BMI Z-SCORE	0.25 (0.004)	0.43 (0.003)
AVG WITHIN INDIVIDUAL CHANGE IN BMI % 95TH	-2.66 (0.06)	-1.33 (0.04)
AVG WITHIN INDIVIDUAL CHANGE IN BMI Z-SCORE	-0.019 (0.005)	0.043 (0.003)
AVG WITHIN INDIVIDUAL CHANGE IN BMI	1.47 (0.02)	1.85 (0.01)
OBESITY PREVALENCE	0.10 (0.001)	0.15 (0.0009)

LIMITATIONS

After significant time and effort working with the University of Washington medical record systems analysts, the analysts were unable to correct errors in the creation of the dataset, and the data were not usable. For this reason, the final adult sample includes only patients from the Kaiser Permanente Washington Health System.