

SUPPLEMENTAL MATERIAL

Sugar-sweetened beverage consumption: A risk factor for prevalent gout that interacts with *SLC2A9* genotype in a non-additive fashion

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Subjects and Methods

Data collection

New Zealand participants were asked their normal daily sugar-sweetened beverage (SSB) intake (“How many cans or large glasses (~300 ml) of sugar-sweetened drinks, including fruit juice but excluding diet drinks, do you normally drink per day?”) on a scale of 0,1,2,3,4,5 or more than 5. In the analysis, seven categories of SSB were created; 0, 0-1, 1, 2, 3, 4, 5 or more cans or large glasses of a sugar-sweetened drink per day (the 0-1 category allowed for people who voluntarily reported less than one serving per week). Although these data were not validated by diet records, they were comparable to survey data from South Australia where 11.6% of adults consumed ≥ 0.5 litres of soft-drink (excluding fruit juice) per day (1) - in the NZ European Caucasian control sample set 18.9% of participants reported drinking ≥ 2 (≥ 600 millilitres) SSB (including fruit juice) per day. Average SSB/day was 0.94 in NZ European Caucasian controls, 1.46 in Māori controls and 2.04 in Pacific Island controls. In questions 11, 64 and 65 of Exam One ARIC participants were asked how many “Orange or grapefruit juice; 1 glass”, “Regular soft drinks, such as Coke, Pepsi, 7-Up, ginger ale; 1 glass” and “Fruit-flavored punch or non-carbonated beverages, such as lemonade, Kool-Aid or Hawaiian Punch; not diet; 1 glass”, respectively, they had consumed in 9 categories ranging from “almost never” to >6 /day. The consumption derived from responses to the 3 questions were combined and converted into SSB categories equivalent to those used for the NZ data. Data from artificially-sweetened soft drinks were derived from question 63, how many “Low calorie soft drinks, such as diet Coke, diet Pepsi, diet 7-Up; 1 glass” (data on artificially-sweetened soft drink consumption were not available in the NZ sample sets) and combined in categories equivalent to the SSB exposure data.

New Zealand participants were asked “How many pieces of whole fresh fruit do you usually eat per day?”. Fruit consumption in ARIC, self-reported in Exam One, were combined from questions 9, 10,

12-14 (apples, oranges, peaches, apricots, plums, bananas, other fruits). NZ participants self-reported the amount of alcoholic drinks (beer, wine, spirits) consumed in the previous week. Similarly, ARIC participants self-reported weekly beer, wine and liquor consumption at Exam One (questions 96-98). Fruit and alcohol consumption were summed into a per day continuous variable.

New Zealand subjects also self-reported other metabolic medical conditions (hypertension and kidney problems). Serum urate was measured in NZ participants using the Trinder assay with a Roche Modular P (Hitachi) analyzer. From the ARIC data, urate measurements at Exam One were used, and anthropomorphic and blood pressure data were available from Exam One and kidney disease status from Exam Three (1993-1994). In the ARIC cohort, determination of gout status from Exam Four (not available at Exam One), 9 years after the exposure data were collected at Exam One, means it is likely that some cases were not diagnosed with gout when the exposure data were collected.

Genotyping of SLC2A9 single nucleotide polymorphism *rs11942223* was done using TaqMan SNP genotyping assay technology (Applied Biosystems) over the NZ samples. The ARIC samples had previously been genotyped for surrogate marker *rs6449173* using the Affymetrix 6.0 platform.

References

1. Shi Z, Dal Grande E, Taylor AW, Gill TK, Adams R, Wittert G. Association between soft drink consumption and asthma and chronic obstructive pulmonary disease among adults in Australia. *Respirology*. 2012;17:363-369.

Supplemental Table 1 Baseline characteristics by sugar-sweetened beverage intake.

	Controls								Frequency of SSB (servings/day)								Cases							
	0	0.1-0.9	1-1.9	2-2.9	3-3.9	4-4.9	5+	β (P) [†]	0	0.1-0.9	1-1.9	2-2.9	3-3.9	4-4.9	5+	β (P) [†]								
NZ Caucasian																								
Number of individuals (%)	96 (53.3%)	2 (1.1%)	48 (26.7%)	13 (7.2%)	12 (6.7%)	2 (1.1%)	7 (3.9%)	-	220 (53.4%)	7 (1.7%)	87 (21.1%)	45 (10.9%)	18 (4.4%)	18 (4.4%)	17 (4.1%)	-								
Age, mean (range), years	47 (18-79)	57 (56-58)	44 (17-68)	38 (18-53)	34 (19-56)	34 (21-46)	44 (29-66)	-3.211 (1.2x10 ⁻³)	65 (23-93)	58 (47-82)	63 (23-91)	62 (27-85)	58 (23-94)	62 (38-85)	58 (28-81)	-0.842 (0.055)								
Sex, % male	43.8%	50.0%	47.9%	38.5%	66.7%	50.0%	57.1%	-0.076 (0.016)	72.0%	100%	74.7%	91.1%	88.9%	88.9%	100%	-0.033 (0.016)								
BMI, mean (range)	28.4 (19.6-62.7)	28.0 (25.0-31.1)	27.3 (19.5-37.1)	28.2 (22.0-37.0)	28.4 (20.9-56.3)	43.8 (29.5-58)	30.3 (23.1-39.1)	0.916 (0.037)	29.9 (19.2-60.7)	34.7 (24.4-61.4)	29.7 (20.1-42.0)	29.6 (22.0-40.1)	29.4 (22.4-36.6)	28.9 (22.3-36.8)	30.0 (21.3-37.7)	-0.167 (0.349)								
Uric acid, mean (range)	0.27 (0.13-0.52)	0.27 (0.22-0.32)	0.31 (0.18-0.48)	0.30 (0.18-0.42)	0.33 (0.21-0.44)	0.30	0.30 (0.20-0.66)	0.012 (0.029)	0.39 (0.13-0.66)	-	0.38 (0.19-0.63)	0.44 (0.28-0.65)	0.36 (0.20-0.64)	0.42 (0.25-0.69)	0.41 (0.23-0.60)	0.006 (0.241)								
Alcohol intake, mean servings/week (range)	5.9 (0-30)	6.0 (6)	6.3 (0-30)	5.4 (0-24)	4.8 (0-13)	0 (0)	13 (0-48)	0.288 (0.554)	6.5 (0-35)	8.3 (2-17)	6.9 (0-35)	8.7 (0-41)	13.6 (0-84)	8.6 (0-40)	8.5 (0-34)	0.329 (0.317)								
Kidney problems, %	3.2%	0%	0%	0%	0%	0%	0%	-0.007 (0.429)	18.5%	0%	16.7%	18.2%	11.8%	22.2%	17.7%	0.008 (0.528)								
High blood pressure, %	12.6%	0%	8.9%	0%	8.3%	0%	14.3%	-0.024 (0.204)	52.8%	14.3%	53.5%	48.9%	44.4%	38.9%	29.4%	-0.015 (0.375)								
NZ Māori																								
Number of individuals (%)	120 (38.5%)	7 (2.2%)	78 (25.0%)	37 (11.9%)	25 (8.0%)	14 (4.5%)	31 (9.9%)	-	75 (39.5%)	5 (2.6%)	32 (16.8%)	16 (8.4%)	19 (10.0%)	17 (9.0%)	26 (13.7%)	-								
Age, mean (range), years	48 (18-75)	48 (40-63)	40 (18-80)	38 (18-67)	40 (17-66)	34 (20-49)	39 (17-65)	-1.768 (3.7x10 ⁻³)	59 (25-81)	54 (45-64)	52 (30-81)	51 (26-77)	52 (23-69)	49 (31-68)	50 (33-74)	-1.239 (0.003)								
Sex, % male	26.3%	42.9%	26.9%	37.8%	60.0%	28.6%	48.4%	-0.039 (0.020)	69.3%	100%	81.3%	86.7%	94.4%	88.2%	88.5%	-0.026 (0.082)								
BMI, mean (range)	31.6 (20.8-62.5)	35.1 (28.8-40.3)	31.9 (21.4-77.0)	31.4 (19.4-56.8)	33.5 (19.4-46.4)	33.6 (24.8-44.9)	33.3 (18.1-59.8)	0.320 (0.224)	34.8 (22.1-72.7)	36.4 (26.8-50.6)	34.2 (23.2-62.1)	32.5 (21.7-42.1)	36.5 (24.6-51.6)	36.1 (27.1-46.5)	36.3 (23.1-48.3)	0.051 (0.864)								
Uric acid, mean (range)	0.32 (0.15-0.55)	0.37 (0.31-0.40)	0.32 (0.15-0.53)	0.35 (0.21-0.58)	0.39 (0.20-0.67)	0.36 (0.24-0.47)	0.36 (0.19-0.54)	0.005 (0.101)	0.40 (0.11-0.67)	0.40 (0.23-0.59)	0.41 (0.25-0.59)	0.42 (0.19-0.61)	0.46 (0.23-0.60)	0.42 (0.28-0.57)	0.42 (0.26-0.55)	0.002 (0.659)								
Alcohol intake, mean servings/week (range)	3.3 (0-35)	0.6 (0-3)	6.0 (0-66)	3.8 (0-30)	7.8 (0-60)	3.9 (0-24)	3.1 (0-17)	-0.274 (0.319)	6.0 (0-120)	6.2 (0-50)	8.0 (0-50)	4.3 (0-15)	4.7 (0-24)	7.5 (0-50)	9.6 (0-96)	-0.138 (0.811)								
Kidney problems, %	4.4%	0%	2.6%	0%	0%	0%	3.3%	-0.003 (0.515)	17.8%	25.0%	21.9%	12.5%	31.6%	11.8%	13.0%	0.003 (0.838)								
High blood pressure, %	20.0%	42.9%	15.4%	8.1%	17.4%	0%	22.6%	-0.003 (0.782)	58.9%	60.0%	67.7%	31.3%	50.0%	58.8%	62.5%	0.014 (0.454)								

Supplemental Table 1 cont Baseline characteristics by sugar-sweetened beverage intake.

	49 (22.6%)	0 (0%)	47 (21.7%)	47 (21.7%)	38 (17.5%)	10 (4.6%)	26 (12.0%)	- (0.007)	71 (22.0%)	4 (1.2%)	58 (18.0%)	57 (17.7%)	46 (14.3%)	35 (10.8%)	52 (16.1%)	-	
NZ Pacific Island																	
Number of individuals (%)	49 (22.6%)	0 (0%)	47 (21.7%)	47 (21.7%)	38 (17.5%)	10 (4.6%)	26 (12.0%)	- (0.007)	71 (22.0%)	4 (1.2%)	58 (18.0%)	57 (17.7%)	46 (14.3%)	35 (10.8%)	52 (16.1%)	-	
Age, mean (range), years	45 (21-85)	-	38 (18-63)	40 (17-67)	42 (18-86)	39 (19-66)	33 (18-47)	-1.403 (0.007)	51 (22-75)	46 (27-69)	49 (26-81)	48 (22-79)	47 (20-79)	48 (18-74)	42 (22-75)	-0.798 (0.018)	
Sex, % male	53.1%	-	55.3%	55.3%	56.8%	50.0%	80.8%	-0.060 (0.006)	80.8%	80.0%	82.8%	93.0%	93.6%	91.7%	88.5%	-0.005 (0.594)	
BMI, mean (range)	33.0 (19.4-50.3)	-	34.7 (23.4-54.8)	35.5 (20.5-65.1)	35.8 (23.4-54.9)	37.9 (31.5-42.6)	35.9 (24.7-47.9)	0.916 (0.004)	35.3 (24.0-53.5)	34.1 (21.5-42.9)	35.6 (26.3-52.5)	36.0 (27.0-54.6)	36.1 (26.0-51.6)	35.4 (24.7-52.8)	38.2 (26.1-55.0)	0.241 (0.308)	
Uric acid, mean (range)	0.35 (0.26-0.48)	-	0.37 (0.20-0.55)	0.38 (0.27-0.55)	0.39 (0.17-0.57)	0.36 (0.23-0.45)	0.41 (0.26-0.57)	0.005 (0.115)	0.44 (0.18-0.70)	0.43 (0.27-0.52)	0.44 (0.17-0.64)	0.45 (0.29-0.63)	0.48 (0.26-0.68)	0.46 (0.22-0.70)	0.50 (0.20-0.65)	0.012 (0.003)	
Alcohol intake, mean servings/week (range)	4.5 (0-36)	-	2.6 (0-35)	3.3 (0-27)	2.4 (0-20)	8 (0-37)	6.3 (0-48)	-0.083 (0.795)	2.4 (0-24)	6.6 (0-32)	3.1 (0-24)	3.2 (0-33)	4.9 (0-23)	3.4 (0-18)	6.6 (0-30)	0.341 (0.273)	
Kidney problems, %	0%	-	0%	4.4%	2.9%	10.0%	0%	0.015 (0.015)	23.9%	20.0%	18.2%	7.6%	6.4%	8.6%	4.0%	-0.019 (0.050)	
High blood pressure, %	22.9%	-	15.2%	17.4%	13.5%	20.0%	0%	-0.024 (0.108)	62.5%	20.0%	46.4%	48.2%	37.0%	44.1%	42.3%	-0.011 (0.462)	
ARIC																	
Number of individuals (%)	537 (7.8%)	3264 (47.1%)	2255 (32.6%)	584 (8.5%)	150 (2.2%)	16 (0.2%)	121 (1.7%)	-	7 (4.7%)	74 (50.0%)	44 (29.7%)	12 (8.1%)	7 (4.7%)	0 (0%)	4 (2.7%)	-	
Age, mean (range), years	54.5 (44-65)	53.7 (44-65)	54 (44-65)	53 (44-65)	53 (45-64)	49 (45-64)	51 (44-64)	-0.503 (3.6x10 ⁻¹⁴)	55 (45-63)	55 (45-65)	55 (46-64)	54.4 (46-63)	51 (45-61)	-	49 (45-55)	-0.699 (0.068)	
Sex, % male	34.6%	45.3%	47.7%	56.7%	60.7%	62.5%	55.4%	-0.057 (1.7x10 ⁻²³)	71.4%	67.6%	81.8%	91.7%	85.7%	-	75.0%	-0.047 (0.104)	
BMI, mean (range)	26.2 (14.9-44.6)	26.4 (14.4-54.6)	26.2 (16.2-54.5)	26.4 (17.3-46.5)	27.1 (18.8-53.8)	25.6 (19.4-30.7)	26.1 (17.1-41.1)	-0.100 (0.058)	30.6 (25.6-36.7)	28.1 (21.6-40.0)	27.0 (21.1-40.5)	29.0 (23.1-39.9)	28.6 (21.6-37.7)	-	27.4 (25.9-30.4)	-0.303 (0.281)	
Uric acid, mean (range)	0.32 (0.12-0.57)	0.33 (0.09-0.67)	0.34 (0.03-0.71)	0.34 (0.11-0.70)	0.37 (0.07-0.55)	0.35 (0.18-0.57)	0.35 (0.15-0.63)	0.004 (5.0x10 ⁻⁷)	0.44 (0.28-0.52)	0.40 (0.22-0.60)	0.42 (0.11-0.64)	0.45 (0.26-0.56)	0.51 (0.35-0.69)	-	0.41 (0.31-0.55)	0.010 (0.089)	
Alcohol intake, mean servings/week (range)	3.2 (0-45)	3.5 (0-63)	3.2 (0-93)	3.5 (0-56)	2.7 (0-30)	4.0 (0-36)	4.7 (0-70)	-0.136 (0.080)	2.6 (0-17)	5.9 (0-34)	5.4 (0-43)	8.3 (0-30)	4.4 (0-12)	-	5.5 (0-16)	-0.544 (0.355)	
Kidney problems, %	1.4%	1.0%	1.4%	1.1%	0.7%	0%	0%	-0.001 (0.435)	0%	0%	2.3%	0%	14.3%	-	0%	0.011 (0.169)	
High blood pressure, %	12.7%	12.1%	13.2%	13.5%	12.0%	13.3%	8.3%	0.000 (0.994)	57.1%	16.2%	18.2%	33.3%	14.3%	-	25.0%	-0.001 (0.965)	

Individual variables analysed by linear regression for association with SSB (as a continuous variable).

¹ Regression coefficients are adjusted by age, sex, BMI, alcohol (continuous variable), fruit intake (continuous variable), kidney disease, high blood pressure, and relatedness (ARIC only; 501/7075 were related) except when the variable was the dependent variable.

Supplemental Table 2. Individual adjustments of the odds ratios for SSB intake and risk of gout

	Obs	Frequency of SSB (servings/day)								≥4.0 ¹	P _{Trend} ²
		0	0.01-0.99	1.00-1.99	2.00-2.99	3.00-3.99	4.00-4.99	5.00+			
Unadjusted											
NZ Caucasian OR (95% CI)	592	1	1.53 (0.31-7.49)	0.79 (0.52-1.21)	1.51 (0.78-2.93)	0.65 (0.30-1.41)	3.93 (0.89-17.26)	1.06 (0.43-2.64)	1.70 (0.79-3.67)	0.56	
P		-	0.6	0.28	0.22	0.28	0.07	0.9	0.18		
NZ Maori OR (95% CI)	502	1	1.14 (0.35-3.73)	0.66 (0.40-1.08)	0.69 (0.36-1.33)	1.22 (0.63-2.36)	1.94 (0.91-4.17)	1.34 (0.74-2.43)	1.53 (0.92-2.54)	0.17	
P		-	0.83	0.1	0.27	0.56	0.088	0.33	0.1		
NZ Pacific Island OR (95% CI)	536	1	-	0.85 (0.50-1.45)	0.84 (0.49-1.42)	0.84 (0.48-1.47)	2.42 (1.09-5.33)	1.38 (0.76-2.50)	1.67 (0.98-2.84)	0.16	
P		-	-	0.55	0.51	0.53	0.029	0.29	0.06		
ARIC OR (95% CI)	7059	1	1.74 (0.80-3.80)	1.50 (0.67-3.34)	1.58 (0.62-4.03)	3.58 (1.24-10.37)	-	2.54 (0.73-8.80)	2.24 (0.65-7.76)	0.2	
P		-	0.17	0.33	0.34	0.019	-	0.14	0.2		
Age											
NZ Caucasian OR (95% CI)	592	1	1.78 (0.33-9.49)	1.02 (0.60-1.71)	2.59 (1.16-5.80)	2.08 (0.75-5.76)	6.26 (1.11-35.35)	2.19 (0.71-6.77)	3.13 (1.23-7.96)	0.005	
P		-	0.5	0.95	0.02	0.16	0.038	0.17	0.017		
NZ Maori OR (95% CI)	501	1	1.46 (0.42-5.07)	1.21 (0.69-2.14)	1.38 (0.66-2.89)	2.09 (0.98-4.49)	4.94 (2.06-11.86)	2.72(1.38-5.36)	3.33 (1.84-6.03)	1.0x10 ⁻⁴	
P		-	0.55	0.51	0.4	0.058	3.6x10 ⁻⁴	0.004	7.2x10 ⁻⁵		
NZ Pacific Island OR (95% CI)	535	1	-	1.08 (0.61-1.89)	1.07 (0.61-1.88)	1.05 (0.57-1.90)	3.18 (1.37-7.35)	2.37 (1.25-4.51)	2.61 (1.47-4.65)	0.005	
P		-	-	0.8	0.81	0.89	0.007	0.008	0.001		
ARIC OR (95% CI)	7059	1	1.78 (0.81-3.88)	1.51 (0.68-3.38)	1.64 (0.64-4.19)	3.74 (1.29-10.85)	-	2.74 (0.79-9.55)	2.44 (0.70-8.48)	0.16	
P		-	0.15	0.31	0.31	0.015	-	0.11	0.16		
Sex											
NZ Caucasian OR (95% CI)	590	1	1.04 (0.20-5.35)	0.76 (0.48-1.19)	1.22 (0.61-2.44)	0.49 (0.22-1.09)	3.03 (0.67-13.77)	0.73 (0.28-1.87)	1.22 (0.55-2.72)	0.6	
P		-	0.96	0.22	0.57	0.081	0.15	0.51	0.62		
NZ Maori OR (95% CI)	498	1	0.65 (0.18-2.42)	0.57 (0.32-1.01)	0.45 (0.22-0.96)	0.56 (0.27-1.19)	1.45 (0.61-3.49)	0.79 (0.40-1.56)	0.98 (0.55-1.75)	0.49	
P		-	0.52	0.056	0.038	0.13	0.4	0.51	0.95		

NZ Pacific Island OR (95% CI)		1	-	0.82 (0.47-1.45)	0.73 (0.41-1.29)	0.72(0.39-1.32)	2.13 (0.92-4.92)	1.06 (0.56-2.00)	1.34 (0.76-2.37)	
P	535	-	-	0.5	0.28	0.29	0.078	0.86	0.31	0.65
ARIC OR (95% CI)		1	1.53 (0.70-3.35)	1.28 (0.57-2.86)	1.22 (0.48-3.15)	2.68 (0.92-7.80)	-	2.00 (0.57-6.99)	1.75 (0.50-6.11)	
P	7059	-	0.29	0.55	0.68	0.071	-	0.28	0.38	0.52
BMI										
NZ Caucasian OR (95% CI)		1	1.32 (0.26-6.61)	0.81 (0.53-1.25)	1.43 (0.73-2.79)	0.66 (0.30-1.43)	3.77 (0.85-16.66)	1.00 (0.40-2.52)	1.62 (0.74-3.52)	
P	582	-	0.74	0.35	0.3	0.29	0.08	0.99	0.22	0.64
NZ Maori OR (95% CI)		1	0.99 (0.30-3.27)	0.65 (0.39-1.09)	0.70 (0.36-1.36)	1.09 (0.56-2.14)	1.75 (0.81-3.79)	1.21(0.81-2.23)	1.38 (0.82-2.32)	
P	496	-	0.98	0.1	0.3	0.8	0.16	0.53	0.22	0.34
NZ Pacific Island OR (95% CI)		1	-	0.90 (0.52-1.55)	0.78 (0.45-1.34)	0.81 (0.45-1.44)	2.60 (1.14-5.93)	1.22 (0.66-2.24)	1.57 (0.91-2.71)	
P	526	-	-	0.7	0.36	0.47	0.024	0.52	0.1	0.31
ARIC OR (95% CI)		1	1.53 (0.70-3.35)	1.28 (0.57-2.86)	1.22 (0.48-4.15)	2.68 (0.92-7.80)	-	2.00 (0.57-6.99)	2.29 (0.66-7.95)	
P	7057	-	0.29	0.55	0.68	0.071	-	0.28	0.19	0.18
Alcohol Intake (continuous)										
NZ Caucasian OR (95% CI)		1	1.49 (0.30-7.30)	0.79 (0.51-1.20)	1.47 (0.76-2.86)	0.62 (0.29-1.35)	3.86 (0.88-17.00)	1.01 (0.40-2.52)	1.64 (0.76-3.55)	
P	592	-	0.63	0.27	0.25	0.23	0.074	0.99	0.21	0.66
NZ Maori OR (95% CI)		1	1.07 (0.32-3.56)	0.62 (0.37-1.03)	0.70 (0.36-1.34)	1.16 (0.59-2.27)	1.89 (0.88-4.08)	1.30 (0.71-2.37)	1.48 (0.89-2.48)	
P	502	-	0.91	0.065	0.29	0.66	0.11	0.39	0.13	0.21
NZ Pacific Island OR (95% CI)		1	-	0.87 (0.51-1.47)	0.85 (0.50-1.44)	0.83 (0.47-1.46)	2.42 (1.09-5.33)	1.34 (0.74-2.44)	1.64 (0.96-2.80)	
P	536	-	-	0.6	0.54	0.51	0.029	0.34	0.069	0.2
ARIC OR (95% CI)		1	1.72 (0.79-3.76)	1.49 (0.67-3.32)	1.54 (0.60-3.95)	3.66 (1.26-10.62)	-	2.27 (0.65-7.96)	2.01 (0.58-7.04)	
P	7059	-	0.17	0.33	0.37	0.017	-	0.2	0.27	0.24
Fruit Intake (continuous)										
NZ Caucasian OR (95% CI)		1	1.54 (0.31-7.56)	0.83 (0.54-1.28)	1.51 (0.78-2.92)	0.67 (0.31-1.44)	3.83 (0.87-16.85)	1.09 (0.44-2.72)	1.70 (0.79-3.69)	
P	589	-	0.59	0.41	0.23	0.31	0.076	0.86	0.18	0.5
NZ Maori OR (95% CI)		1	1.16 (0.35-3.81)	0.64 (0.38-1.06)	0.69(0.36-1.32)	1.21 (0.62-2.35)	1.93 (0.90-4.15)	1.38 (0.76-2.52)	1.56 (0.84-2.60)	
	498									0.16

P		-	0.81	0.081	0.26	0.57	0.091	0.29	0.088	
NZ Pacific Island OR (95% CI)		1	-	0.89 (0.52-1.52)	0.86 (0.51-1.47)	0.86 (0.49-1.53)	2.41 (1.09-5.33)	1.57 (0.85-2.90)	1.82 (1.06-3.14)	
P	526	-	-	0.67	0.27	0.61	0.03	0.15	0.03	0.094
ARIC OR (95% CI)		1	1.73 (0.79-3.78)	1.50 (0.67-3.35)	1.58 (0.62-4.05)	3.62 (1.25-10.50)	-	2.53 (0.73-8.78)	2.24 (0.65-7.75)	
P	7059	-	0.17	0.32	0.34	0.018	-	0.14	0.2	0.19
Kidney disease										
NZ Caucasian OR (95% CI)		1	1.87 (0.38-9.16)	0.83 (0.53-1.30)	1.51 (0.77-2.98)	0.68 (0.31-1.50)	3.83 (0.86-17.13)	1.27 (0.48-3.40)	1.91 (0.84-4.35)	
P	579	-	0.44	0.42	0.23	0.34	0.079	0.63	0.12	0.41
NZ Maori OR (95% CI)		1	0.90 (0.24-3.37)	0.65 (0.38-1.10)	0.79 (0.40-1.53)	1.16 (0.57-2.35)	2.27 (1.02-5.03)	1.28 (0.67-2.42)	1.58 (0.92-2.70)	
P	486	-	0.88	0.11	0.47	0.68	0.044	0.45	0.098	0.17
NZ Pacific Island OR (95% CI)		1	-	0.85 (0.49-1.49)	0.87 (0.50-1.52)	1.04 (0.58-1.89)	2.54 (1.13-5.71)	1.60 (0.86-2.98)	1.87 (1.07-3.26)	
P	514	-	-	0.57	0.62	0.89	0.024	0.14	0.027	0.043
ARIC OR (95% CI)		1	1.72 (0.79-3.75)	1.48 (0.66-3.30)	1.57 (0.61-4.02)	3.63 (1.25-10.52)	-	2.64 (0.76-9.18)	2.31 (0.66-8.00)	
P	6745	-	0.17	0.34	0.35	0.018	-	0.13	0.19	0.18
High Blood Pressure										
NZ Caucasian OR (95% CI)		1	2.55 (0.51-12.84)	0.85 (0.53-1.36)	1.69 (0.84-3.41)	0.75 (0.33-1.73)	4.94 (1.09-22.46)	1.42 (0.55-3.71)	2.21 (0.99-4.94)	
P	585	-	0.26	0.49	0.15	0.5	0.039	0.47	0.054	0.19
NZ Maori OR (95% CI)		1	0.83 (0.22-3.10)	0.63 (0.36-1.11)	1.01 (0.50-2.06)	1.39 (0.66-2.96)	2.49 (1.06-5.84)	1.14 (0.58-2.25)	1.51 (0.85-2.68)	
P	488	-	0.78	0.11	0.98	0.39	0.036	0.7	0.16	0.16
NZ Pacific Island OR (95% CI)		1	-	1.04 (0.58-1.85)	1.02 (0.57-1.82)	1.16 (0.63-2.14)	2.91 (1.26-6.74)	2.00 (1.05-3.80)	2.26 (1.27-4.04)	
P	524	-	-	0.89	0.94	0.63	0.013	0.035	0.006	0.015
ARIC OR (95% CI)		1	1.75 (0.80-3.82)	1.50 (0.67-3.34)	1.58 (0.62-4.05)	3.60 (1.24-10.42)	-	2.61 (0.75-9.06)	2.31 (0.67-8.02)	
P	7022	-	0.16	0.33	0.34	0.018	-	0.13	0.19	0.19

1 The 4.0-4.99 and 5+ groups were collapsed and used in logistic regression with the 5 other categorical groups – data reported only for the resultant ≥ 4 SSB/day group (in italics).

2 P_{Trend} was the P value associated with the single line SSB variable in regression analysis.

Supplemental Table 3 Association analysis of *SLC2A9* genotype and risk of gout

	Genotype (count, freq) ¹			Minor-allele frequency	Allelic OR ² [95% CI], <i>P</i>	Allelic OR ² [95% CI], <i>P</i>	Hardy-Weinberg <i>P</i>
	TT	CT	CC				
NZ European Caucasian							
Case	291 (0.728)	104 (0.260)	10 (0.013)	0.143	0.58 [0.42-0.81],	0.59 [0.37-0.94],	0.20
Control	105 (0.618)	55 (0.324)	10 (0.059)	0.221	0.001	0.027	0.44
NZ Maori							
Case	167 (0.903)	15 (0.081)	3 (0.016)	0.057	0.84 [0.50-1.42],	0.70 [0.32-1.54],	0.001
Control	264 (0.868)	39 (0.128)	1 (0.003)	0.067	0.52	0.37	0.73
NZ Pacific Island							
Case	303 (0.956)	14 (0.044)	0 (0.000)	0.022	0.56 [0.27-1.13],	0.35 [0.15-0.83],	0.69
Control	198 (0.925)	15 (0.070)	1 (0.005)	0.040	0.11	0.016	0.24
ARIC							
Case	105 (0.709)	39 (0.264)	4 (0.027)	0.159	0.67 [0.49-0.89],	0.64 [0.47-0.89],	0.87
Control	4200 (0.606)	2414 (0.348)	313 (0.045)	0.219	0.012	0.007	0.15

1 *rs11942223* genotyped in NZ sample sets; surrogate *rs6449173* (major allele A, minor allele C) – $r^2=1$ with *rs11942223* in European Caucasian used in ARIC.

2 Unadjusted.

3 Adjusted by age, sex, BMI, alcohol (continuous variable), fruit intake (continuous variable), kidney disease and high blood pressure.