Obesity and social network influence in inflammatory biomarkers in a general youth population

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1 Abstract

1.1 Methods

The Fit Futures 1 study collected interview data on social contact among 1038 first level students in the same high school district in Norway. In this context, we also collected blood samples (n = 937), OLINK inflamatory proteomic data (n = 936) and did antropomorphic measurements (n = 1034). Social networks were constructed from self-reported social contact between participants.

All statistics summary things goes here.

1.2 Findings

There is an association between lifestyle factors, diseases, vitamim D levels and social interaction with several biomarkers.

1.3 Interpretation

We found results that might suggest that people in your social network may influence your inflammatory response.

1.4 Funding

The Northern Norway regional Health Authorities (grant number HNF1457-19) funded this study.

2 Introduction

Obesity is a condition associated with several health problems including the number one cause of death in almost every socio-economic group, cardiovascular diseases, as well as many types of cancers and other complications.

While there are genetic conditions associated with it, the most common causes of obesity are excessive food consumption or a lack of exercise. In simple terms your amount of body fat is simply the difference between your energy intake and energy output. These two factors are heavily influenced by your lifestyle, which in term are impacted by your friends. Obesity, despite not been caused by a viral, bacterial, or parasitic agent, is nevertheless contagious among close group of friends [1]. Even though it is impossible for an individual to perform lipogenesis with what somebody else eats, people tend to behave in the same way to their peers, and end up eating and exercising similarly as their direct contact network.

Obesity is associated with the inflammatory response of your immune system. While the exact mechanism is unclear, it might be due that a poor immune response that otherwise would have curled the infiltration of opportunistic bacteria, thus causing an unwelcome inflammatory response. In this study we explore the possibility that people in the same social network can influence your influence response, as well as how much these biomarkers are expressed with respect to your anthropometric variables. Answering two fundamental questions:

- Does the spread of levels of obesity also spread the biomarkers levels?
- How does the average proteomic profile compare between different categories of obesity?

3 Methods

3.1 Population and study design

The Tromsø Study Fit Futures 1 (TFF1) is a health survey conducted from 2010 to 2011 in the duration of 8 months. All first-year high school students in the municipalities of Tromsø and Balsfjord, Norway were invited. TFF1 included students from eight schools consecutively. A total of 1117 youths were invited and 93% attended, 508 girls and 530 boys.

Participants had a one-day visit at The Clinical Research Unit at the University Hospital of North Norway (UNN), including clinical examinations, microbiological samples, blood samples, a web-based general questionnaire, and an interview [2]. All procedures were performed by trained research nurses.

3.2 Host risk factors

Height and weight were measured on an electronic scale with participants wearing light clothing and no footwear. BMI was calculated as weight (kg) divided by the squared height (m^2). From the web-based questionnaire we got information about lifestyle including, sex, age, type of studies and recreational physical activity.

HERE SOME INFORMATION ABOUT HOW THE BLOOD WAS EXTRACTED IS MISSING.

3.3 Olink Target 96 Inflammation

The 92 bioarkers were analyzed at the Clinical Biomarkers Facility, SciLifeLab, (Uppsala, Sweden), using the Target 96 Inflammation panel from OLINK Holding AB (Uppsala, Sweden) [3] . From these 92 biomarkers we have two different values. The LOD (Limit of Detection) value, and the NDL (I still don't know what NDL actually means) value. The LOD level is the lowest value that can be detected, so any number lower than that is censored to the left. The NDL is the real value measured by the machine and can be under the LOD level. When this happens, it cannot be guaranteed that the value is correct.

All the biomarkers detailed information, can be found in 10 on page 15.

3.4 Social network analysis

The social network was constructed based on the following question in the interview: "Which students have you had most contact with the last week? Name up to 5 students at your own school or other schools in Tromsø and Balsfjord.". Reciprocity in the nomination was not mandatory. For each of the nominations, five "yes/no" questions assessed the type of contact they had with their nominations: "Do you have physical contact?", "Are you together at school?", "Are you together at sports?", "Are you together at home?", "Are you together at other places?". This resulted in five social networks: Physical Network, School Network, Sport Network, Home Network, and Other Network (Supplementary Figure 2). Adding all the relationships together formed a sixth network that was called the Overall Network. To evaluate if the friends mentioned were representative for the participants´ social network, the following question was asked: "To what degree does this table of friends give an overview of your social network? Please indicate on a scale from 0 (small degree) to 10 (high degree)." Nominated friends that did not participate in TFF1 were excluded from the analysis (n=134). Each student is represented by one node in the network. Each relationship is represented by an undirected edge, i.e., line, in the network.

3.5 Statistical analysis

3.5.1 Software

Statistical analyses was performed by using R version 3.6.3 and R Studio 1.3.1093. Noticeable libraries were "igraph" [4] "statnet" (sna, egrm) [5] for linear autocorrelation and EGRM analysis, and “ggraph” [6] for display of results.

3.5.2 Host factors

For the evaluation of host risk factors for any categorical data, we applied Xi-square test, with Yates’s correction for 2x2 tables and Fisher correction when applicable. In all cases, all the assumptions for the Xi-square test applied.

3.5.3 Social influence

PROPER CITATIONS HERE

The connection between nodes was analyzed using ERGM or Additive and Multiplicative Effects models (Supplementary Table 1 and Supplementary Figure 5). Patterns of connections (non-carriers connected to non-carriers, non-carriers connected to carriers, carriers connected to carriers) were analyzed by using Simulation Investigation for Empirical Network Analysis, an autocorrelation model [28] (Table 5). Further analysis was done with bootstrapping simulated networks against the observed network (Tables 2, 3 and Supplementary Table 2), descriptive analysis (Supplementary Table 3), and logistic regression (Supplementary Table 4, Figure 4). The mathematical background for the statistical methods is described in the supplementary material.

3.5.4 Ethics

A declaration of consent was signed by each participant in TFF1, participants younger than 16 years of age had to bring written consent from a parent or guardian. TFF1 was approved by The Regional Committee of Medical and Health Research Ethics (REK) and the Norwegian Data Protection Authority. The present study was approved by REK North, reference 2018/1975/REK Nord.

4 Results

4.1 Host factors

There are 3 major groups of variables that we are stuying:

- **Antropometric variables:** Waist and hip circunference (cm), height (cm), weight (kg), BMI (km/m^2), heart rate (bpm), systolic and diastolic blood preasure (mmHg)
- **Questionary data:** Sex, self reported general health, recreational drugs frequency (cigarretes, snuff and alcohol), frequency of sport activity outside school hours, method of transportation to and from school during summer and winter, screen time (computer, tv, mobile phone or tablet), frequency of dietary habits (lean fish, fat fish, cheese, chocolate, fruits, vegetables, dairy products, fruit juice without sugar, fruit juice with sugar, other sugar drinks, water) and highschool affiliation.
- **Staphilococcus Aureus carrier status:** We measure the carrier status in the nose and throat, with both a direct culture and enrich broth (REFERENCE TO THE SA Study here)
- **Blood variables:** Please refer to supplementary table for a detailed summary

4.2 Summary statistics

4.2.1 Sex differences

Men and women have different biological processes that affect the biomarkers levels, regardless of their social network or their current health status. This is appreciated in figure 1 and supplementary table 11 where we provide an overview of all biomarkers with respect sex. Because the difference between sex is sustancial, we stratified the analysis with respect sex.

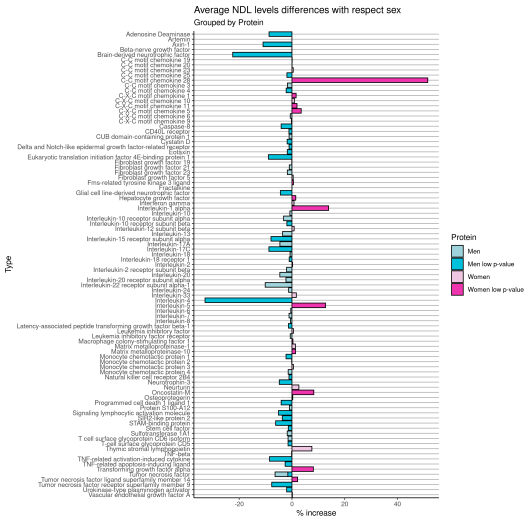


Figure 1: *Overview of all biomarkers diferences with respect sex. In many cases there is a significant difference between men and women ($p<0.05$). Due biological reasons.*

Furthermore, we can also appreciate the antropometric differences in waist perimeter, height, and weight, in table 1 and supplementary figure 4 .

Concept	$\overline{x}_{men}$	$\overline{x}_{women}$	SD_{men}	SD_{women}	Significance
Waist	82.4	77.8	11.7	10.8	****
Hip	97.8	98.1	8.8	8.3	ns
Height	176.9	164.7	6.6	6.6	****
Weight	70.6	61.4	14.6	12.2	****
BMI	22.5	22.6	4.2	4.2	ns
HR	76.2	74.9	13.3	12.4	ns
SYSBP	117.4	118.1	12.8	12.9	ns
DIABP	63.5	63.5	8.1	7.4	ns

Table 1: *Sex differences for antropometry variables*

There are also some significant differences between each of the categorical variables in the host factor, summarized in 2 , detailed information for each variable can be found in tables across supplementary chapter 7.3.

Finally, summarized information about the blood data can be found in 7.4.

4.2.2 LOD vs NDL

In figure 2 we see an overview of all biomarkers levels. Since most of the collected values are well above the LOD, we decided to run all the analysis usind the NDL values. However, please

Variable	p-value	Significance
GeneralHealth	7.52e-01	ns
BMICategorical	1.49e-01	ns
Smoke	1.07e-01	ns
Snuff	1.88e-03	**
Alcohol	1.08e-02	*
SportsLeisure	6.46e-11	****
SummerTransport	3.40e-02	*
WinterTransport	3.63e-01	ns
ScreenTime	9.56e-02	ns
LeanFishFrequency	4.71e-01	ns
FatFishFrequency	3.93e-01	ns
CheeseFrequency	7.37e-01	ns
ChocolateFrequency	5.98e-01	ns
FruitsFrequency	3.98e-01	ns
VegetablesFrequency	9.90e-01	ns
DairyFrequency	7.74e-01	ns
FruitJuiceFrequency	6.46e-02	ns
SugarJuiceFrequency	5.77e-01	ns
SugarDrinkFrequency	9.97e-01	ns
SweetenerDrinkFrequency	4.61e-01	ns
WaterFrequency	3.91e-01	ns
HighSchool	5.98e-16	****
D_NasalCarrier	1.90e-05	****
D_ThroatCarrier	2.22e-03	**
E_NasalCarrier	2.96e-04	***
E_ThroatCarrier	9.95e-07	****

Table 2: *Sex differences for all categorical host factor*

notice that for biomarkers with very high proportion of Under LOD values, the result of the analysis is not guaranteed.

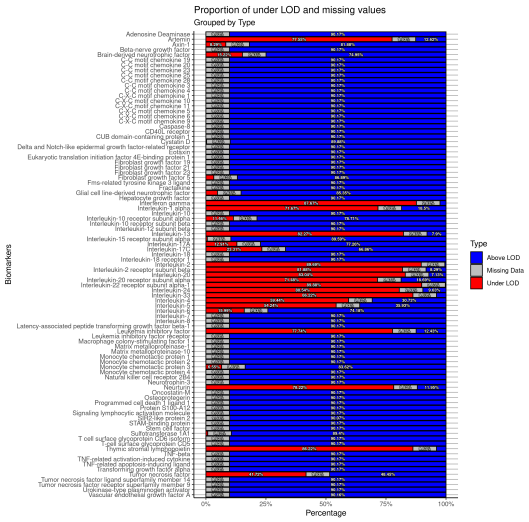


Figure 2: *Overview of all subject (n=1038) biomarkers values with respect LOD levels. Most of the collected values are well above the LOD (blue).*

4.3 Biomarkers

In this section, we show all different test done for each host factor with respect the 92 biomarkers.

4.3.1 Categorical host factors and biomarkers

We performed simple t-testing to find out if there is any association between the categorical data in the host factors and the biomarkers. In this section we only show the results that are statistically significant for either men or women, corrected for both Benjamini in table 3 and Bonferroni in table 4. You can find results that weren't corrected in supplementary materials in section 7.5.

4.3.2 Antropometry and biomarkers

We performed simple F-statistics againts all antrometric variables. Only values significant after bonferroni are shown.

4.3.3 Blood and biomarkers

Same as before, we performed simple F-statistics againts all numerical variables related with blood. Only values significant after bonferroni are shown.

Variable	Biomarker	Men	Women
GeneralHealth	Leukemia inhibitory factor	*	ns
BMICategorical	C-C motif chemokine 3	***	ns
BMICategorical	CUB domain-containing protein 1	****	****
BMICategorical	Macrophage colony-stimulating factor 1	*	**
BMICategorical	Fibroblast growth factor 21	**	*
BMICategorical	Glial cell line-derived neurotrophic factor	**	ns
BMICategorical	Hepatocyte growth factor	****	**
BMICategorical	Interleukin-18	**	**
BMICategorical	Interleukin-18 receptor 1	****	****
BMICategorical	Interleukin-6	***	****
BMICategorical	Monocyte chemotactic protein 3	****	****
BMICategorical	Matrix metalloproteinase-1	*	ns
BMICategorical	Stem cell factor	****	ns
BMICategorical	Tumor necrosis factor receptor superfamily member 9	**	ns
Smoke	Matrix metalloproteinase-10	*	ns
Snuff	Adenosine Deaminase	*	ns
Snuff	Fractalkine	*	ns
Snuff	Fibroblast growth factor 21	*	*
Snuff	Stem cell factor	*	**
Alcohol	Delta and Notch-like epidermal growth factor-related receptor	**	ns
Alcohol	Fibroblast growth factor 21	*	ns
SportsLeisure	Adenosine Deaminase	*	**
SportsLeisure	C-C motif chemokine 19	*	ns
SportsLeisure	Delta and Notch-like epidermal growth factor-related receptor	*	ns
SportsLeisure	Fibroblast growth factor 21	****	***
SportsLeisure	Urokinase-type plasminogen activator	*	*
SummerTransport	Interleukin-4	****	ns
WinterTransport	C-C motif chemokine 19	*	ns
FatFishFrequency	Fractalkine	*	ns
FatFishFrequency	Hepatocyte growth factor	*	ns
FatFishFrequency	Stem cell factor	***	ns
FatFishFrequency	Tumor necrosis factor	*	ns
FruitsFrequency	Interleukin-13	*	ns
VegetablesFrequency	Stem cell factor	*	ns
DairyFrequency	Interleukin-20 receptor subunit alpha	**	ns
WaterFrequency	Interleukin-4	*	ns
HighSchool	Adenosine Deaminase	*	ns
HighSchool	Fractalkine	**	ns
HighSchool	C-X-C motif chemokine 10	*	ns
HighSchool	Delta and Notch-like epidermal growth factor-related receptor	***	ns
HighSchool	Fibroblast growth factor 21	***	***
HighSchool	Fibroblast growth factor 23	**	ns
HighSchool	Interleukin-2	**	ns
HighSchool	Leukemia inhibitory factor receptor	*	ns
HighSchool	Osteoprotegerin	**	ns
HighSchool	Tumor necrosis factor ligand superfamily member 14	*	ns
HighSchool	Urokinase-type plasminogen activator	**	**
E_NasalCarrier	Tumor necrosis factor receptor superfamily member 9	*	ns
GeneralHealth	Matrix metalloproteinase-1	ns	*
BMICategorical	Delta and Notch-like epidermal growth factor-related receptor	ns	**
BMICategorical	Interleukin-10 receptor subunit beta	ns	**
BMICategorical	Monocyte chemotactic protein 4	ns	**
BMICategorical	TNF-related apoptosis-inducing ligand	ns	*
BMICategorical	Vascular endothelial growth factor A	ns	****
Smoke	Adenosine Deaminase	ns	*
Smoke	Delta and Notch-like epidermal growth factor-related receptor	ns	**
Smoke	Fibroblast growth factor 21	ns	***
Smoke	Leukemia inhibitory factor receptor	ns	***
Smoke	Stem cell factor	ns	***
Smoke	Urokinase-type plasminogen activator	ns	****
Snuff	Glial cell line-derived neurotrophic factor	ns	*
Snuff	Urokinase-type plasminogen activator	ns	**
Alcohol	Fibroblast growth factor 5	ns	*
Alcohol	Leukemia inhibitory factor receptor	ns	*
Alcohol	Urokinase-type plasminogen activator	ns	**
SportsLeisure	Interleukin-6	ns	**
LeanFishFrequency	Fibroblast growth factor 21	ns	**
CheeseFrequency	Stem cell factor	ns	*
ChocolateFrequency	Interleukin-2	ns	*
ChocolateFrequency	Leukemia inhibitory factor receptor	ns	**
FruitJuiceFrequency	Neurotrophin-3	ns	****
FruitJuiceFrequency	Stem cell factor	ns	*
SweetenerDrinkFrequency	Neurotrophin-3	ns	***
HighSchool	Interleukin-6	ns	*
HighSchool	Monocyte chemotactic protein 1	ns	*
HighSchool	Stem cell factor	ns	*

Table 3: *Biomarkers that are statistically significant for either men or women, after Benjamini correction*

Variable	Biomarker	Men	Women
GeneralHealth	Leukemia inhibitory factor	*	ns
BMICategorical	C-C motif chemokine 3	***	ns
BMICategorical	CUB domain-containing protein 1	****	****
BMICategorical	Macrophage colony-stimulating factor 1	*	**
BMICategorical	Fibroblast growth factor 21	**	ns
BMICategorical	Glial cell line-derived neurotrophic factor	**	ns
BMICategorical	Hepatocyte growth factor	****	**
BMICategorical	Interleukin-18	**	**
BMICategorical	Interleukin-18 receptor 1	****	****
BMICategorical	Interleukin-6	***	****
BMICategorical	Monocyte chemotactic protein 3	****	****
BMICategorical	Matrix metalloproteinase-1	*	ns
BMICategorical	Stem cell factor	****	ns
BMICategorical	Tumor necrosis factor receptor superfamily member 9	**	ns
Smoke	Matrix metalloproteinase-10	*	ns
Snuff	Adenosine Deaminase	*	ns
Snuff	Fractalkine	*	ns
Alcohol	Delta and Notch-like epidermal growth factor-related receptor	**	ns
SportsLeisure	C-C motif chemokine 19	*	ns
SportsLeisure	Fibroblast growth factor 21	****	**
SportsLeisure	Urokinase-type plasminogen activator	*	ns
SummerTransport	Interleukin-4	****	ns
WinterTransport	C-C motif chemokine 19	*	ns
FatFishFrequency	Hepatocyte growth factor	*	ns
FatFishFrequency	Stem cell factor	***	ns
FatFishFrequency	Tumor necrosis factor	*	ns
FruitsFrequency	Interleukin-13	*	ns
DairyFrequency	Interleukin-20 receptor subunit alpha	**	ns
HighSchool	Fractalkine	**	ns
HighSchool	C-X-C motif chemokine 10	*	ns
HighSchool	Delta and Notch-like epidermal growth factor-related receptor	***	ns
HighSchool	Fibroblast growth factor 21	***	***
HighSchool	Fibroblast growth factor 23	**	ns
HighSchool	Interleukin-2	**	ns
HighSchool	Leukemia inhibitory factor receptor	*	ns
HighSchool	Osteoprotegerin	**	ns
HighSchool	Tumor necrosis factor ligand superfamily member 14	*	ns
HighSchool	Urokinase-type plasminogen activator	**	*
GeneralHealth	Matrix metalloproteinase-1	ns	*
BMICategorical	Delta and Notch-like epidermal growth factor-related receptor	ns	**
BMICategorical	Interleukin-10 receptor subunit beta	ns	**
BMICategorical	Monocyte chemotactic protein 4	ns	**
BMICategorical	TNF-related apoptosis-inducing ligand	ns	*
BMICategorical	Vascular endothelial growth factor A	ns	****
Smoke	Delta and Notch-like epidermal growth factor-related receptor	ns	*
Smoke	Fibroblast growth factor 21	ns	**
Smoke	Leukemia inhibitory factor receptor	ns	***
Smoke	Stem cell factor	ns	***
Smoke	Urokinase-type plasminogen activator	ns	****
Snuff	Glial cell line-derived neurotrophic factor	ns	*
Snuff	Stem cell factor	ns	*
Snuff	Urokinase-type plasminogen activator	ns	*
Alcohol	Fibroblast growth factor 5	ns	*
Alcohol	Urokinase-type plasminogen activator	ns	**
SportsLeisure	Adenosine Deaminase	ns	**
SportsLeisure	Interleukin-6	ns	**
LeanFishFrequency	Fibroblast growth factor 21	ns	*
ChocolateFrequency	Interleukin-2	ns	*
ChocolateFrequency	Leukemia inhibitory factor receptor	ns	*
FruitJuiceFrequency	Neurotrophin-3	ns	****
SweetenerDrinkFrequency	Neurotrophin-3	ns	***
HighSchool	Monocyte chemotactic protein 1	ns	*

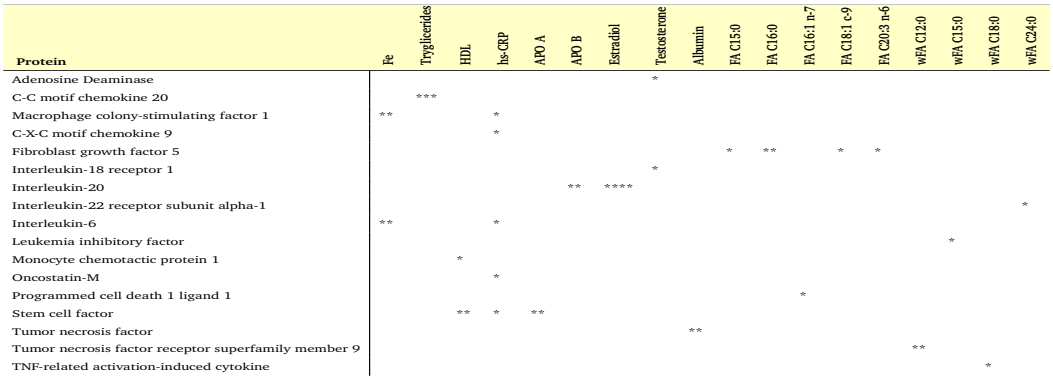
Table 4: *Biomarkers that are statistically significant for either men or women, after Bonferroni correction*

Protein	Waist	Hip	Height	Weight	BMI	HR	SYSBP	DIABP
C-C motif chemokine 3	****	**	ns	***	***	ns	ns	ns
C-C motif chemokine 4	**	ns	ns	ns	ns	ns	ns	ns
CUB domain-containing protein 1	****	****	ns	****	****	ns	ns	ns
Macrophage colony-stimulating factor 1	**	****	ns	***	***	ns	ns	ns
Delta and Notch-like epidermal growth factor-related receptor	*	*	ns	**	*	ns	ns	ns
Fibroblast growth factor 19	ns	ns	ns	ns	*	ns	ns	ns
Fibroblast growth factor 21	****	**	ns	*	**	ns	ns	ns
Glial cell line-derived neurotrophic factor	**	ns	ns	*	**	ns	ns	ns
Hepatocyte growth factor	****	***	ns	****	****	ns	ns	ns
Interleukin-18	***	****	ns	***	***	ns	ns	ns
Interleukin-18 receptor 1	****	****	ns	****	****	ns	ns	ns
Interleukin-20	ns	****	ns	**	ns	ns	ns	ns
Interleukin-6	****	***	ns	****	****	ns	ns	ns
Monocyte chemotactic protein 3	****	****	ns	****	****	ns	ns	ns
Stem cell factor	****	****	ns	****	****	ns	ns	ns
Signaling lymphocytic activation molecule	ns	ns	*	ns	ns	ns	ns	ns
Tumor necrosis factor receptor superfamily member 9	***	ns	ns	*	**	ns	ns	ns

Table 5: *Biomarkers that are statistically significant with respect the antropometry variables in men, after applying Bonferroni correction*

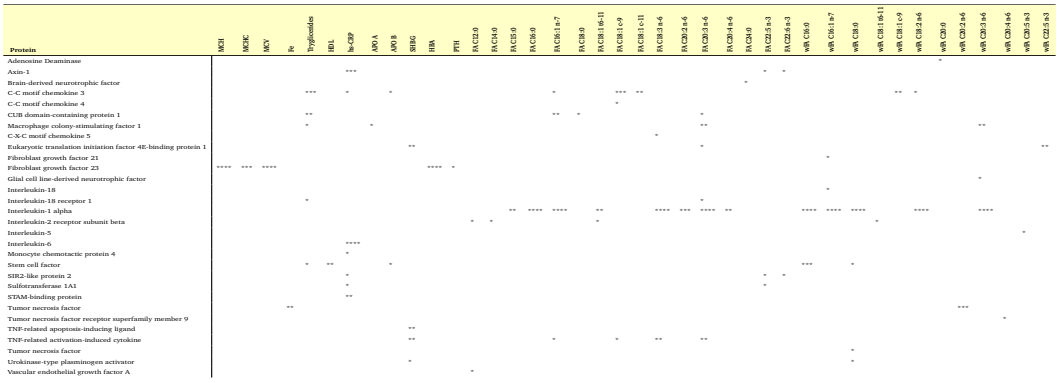
Protein	Waist	Hip	Height	Weight	BMI	HR	SYSBP	DIABP
Caspase-8	*	***	ns	***	***	ns	ns	ns
C-C motif chemokine 3	*	ns	ns	*	ns	ns	ns	ns
CUB domain-containing protein 1	****	****	ns	****	****	ns	ns	ns
Macrophage colony-stimulating factor 1	****	***	ns	**	**	ns	ns	ns
Delta and Notch-like epidermal growth factor-related receptor	ns	ns	ns	*	*	ns	ns	ns
Fibroblast growth factor 21	*	*	ns	ns	*	ns	ns	ns
Hepatocyte growth factor	****	***	ns	**	****	ns	ns	ns
Interleukin-10 receptor subunit beta	****	*	ns	**	**	ns	ns	ns
Interleukin-18	**	*	ns	*	**	ns	ns	ns
Interleukin-18 receptor 1	****	***	ns	***	****	ns	ns	ns
Interleukin-2	*	ns	ns	ns	ns	ns	ns	ns
Interleukin-6	****	****	ns	****	****	ns	ns	ns
Interleukin-7	**	**	ns	**	*	ns	ns	ns
Monocyte chemotactic protein 3	****	****	ns	****	****	ns	ns	ns
Monocyte chemotactic protein 4	*	ns	ns	ns	*	ns	ns	ns
Latency-associated peptide transforming growth factor beta-1	*	*	ns	ns	ns	ns	ns	ns
TNF-related apoptosis-inducing ligand	**	*	ns	ns	*	ns	ns	ns
TNF-related activation-induced cytokine	*	**	ns	*	ns	ns	ns	ns
Vascular endothelial growth factor A	**	*	ns	*	****	ns	ns	ns

Table 6: *Biomarkers that are statistically significant with respect the antropometry variables in women, after applying Bonferroni correction*



Protein	Fe	Tryglicerides	HDL	hs-CRP	APO A	APO B	Estradiol	Testosterone	Albumin	FA C15:0	FA C16:0	FA C16:1 n-7	FA C18:1 c-9	FA C20:3 n-6	wFA C12:0	wFA C15:0	wFA C18:0	wFA C24:0
Adenosine Deaminase								*										
C-C motif chemokine 20		***																
Macrophage colony-stimulating factor 1	**			*														
C-X-C motif chemokine 9				*														
Fibroblast growth factor 5										*	**		*	*				
Interleukin-18 receptor 1								*										
Interleukin-20						**	****											
Interleukin-22 receptor subunit alpha-1																		*
Interleukin-6	**			*														
Leukemia inhibitory factor																*		
Monocyte chemotactic protein 1			*															
Oncostatin-M				*														
Programmed cell death 1 ligand 1												*						
Stem cell factor			**	*	**													
Tumor necrosis factor									**									
Tumor necrosis factor receptor superfamily member 9															**			
TNF-related activation-induced cytokine																	*	

Table 7: *Biomarkers that are statistically significant with respect the blood variables in men, after applying Bonferroni correction. Non-significant values appears as a white space for easy reading.*



Protein	MCH	MCHC	MCV	Fe	Tryglicerides	HDL	hs-CRP	APO A	APO B	SHBG	HBA	PTH	FA C12:0	FA C14:0	FA C15:0	FA C16:0	FA C16:1 n-7	FA C18:0	FA C18:1 n-9	FA C18:1 n-11	FA C18:3 n-6	FA C20:2 n-6	FA C20:3 n-6	FA C20:4 n-6	FA C24:0	FA C22:5 n-3	FA C22:6 n-3	wFA C16:0	wFA C16:1 n-7	wFA C18:0	wFA C18:1 n-9	wFA C18:1 n-11	wFA C18:2 n-6	wFA C20:0	wFA C20:2 n-6	wFA C20:3 n-6	wFA C20:4 n-6	wFA C20:5 n-3	wFA C22:5 n-3
Adenosine Deaminase																																						
Axin-1							***																															
Brain-derived neurotrophic factor																																						
C-C motif chemokine 3					***		*		*								*		***	**																		
C-C motif chemokine 4																			*																			
CUB domain-containing protein 1					**												**						*															
Macrophage colony-stimulating factor 1					*			*															**														**	
C-X-C motif chemokine 5																					*																	
Eukaryotic translation initiation factor 4E-binding protein 1										**													*															**
Fibroblast growth factor 21																													*									
Fibroblast growth factor 23	****	***	****								****	*																										
Glial cell line-derived neurotrophic factor																																					*	
Interleukin-18																													*									
Interleukin-18 receptor 1					*																		*															
Interleukin-1 alpha														**	****		****		**		****	***	****	**		****	****	****						****			****		
Interleukin-2 receptor subunit beta													*	*					*																				
Interleukin-5																																						*	
Interleukin-6							****																																
Monocyte chemotactic protein 4							*																																
Stem cell factor					*	**			*																				***										
SIR2-like protein 2							*																					*	*										
Sulfotransferase 1A1							*																					*											
STAM-binding protein							**																																
Tumor necrosis factor				**																															***				
Tumor necrosis factor receptor superfamily member 9																																					*		
TNF-related apoptosis-inducing ligand										**																													
TNF-related activation-induced cytokine										**							*		*		**		**																
Tumor necrosis factor																														*									
Urokinase-type plasminogen activator										*																				*									
Vascular endothelial growth factor A													*																										

Table 8: *Biomarkers that are statistically significant with respect the blood variables in women, after applying Bonferroni correction. Non-significant values appears as a white space for easy reading.*

4.4 Social Influence

4.4.1 Bootstrapping and simulation

4.4.2 Principal component analysis

4.4.3 Friendship distance matrix

We did a selection of people in the social network. For each person who has at least 2 friends of the same sex, and using the network of same sex only, we measure the distance between people who are friends and compared againts people who are not friend. We compared for signicant between the diferences of distance averages of each biomarker, meaning that if there is significance, your friends and your biomarkers tend to converge to a similar value, hence affecting each others.

4.5 Biomarkers and diseases

4.6 Biomarkers and medicine

5 Discussion

6 Toy section

We should delete this section eventually

This is just to test where the floating images fall in the text. Go wild and do whatever you want here.

Figure 3: *A majestic grizzly bear*

In hac habitasse [**?**] platea dictumst. [**?**] , Vivamus eu finibus leo. Donec malesuada dui non sagittis auctor. Aenean condimentum eros metus. Nunc tempus id velit ut tempus. Quisque fermentum, nisl sit amet consectetur ornare.

I don't like this part

This sentence requires multiple citations to imply that it is better supported. Finally, when conducting an appeal to authority, it can be useful to cite a reference in-text, much like do quite a bit. Oh, and make sure to check out the bear in Figure 3.

$$A = \begin{bmatrix} A_{11} & A_{21} \\ A_{21} & A_{22} \end{bmatrix} \tag{1}$$

Some random text here

1. First numbered item in a list
2. Second numbered item in a list
3. Third numbered item in a list

Pellentesque ac nisi dolor. Pellentesque maximus est arcu, eu scelerisque est rutrum vitae. Mauris ullamcorper vulputate vehicula. Praesent fermentum leo ac velit accumsan consectetur. Aliquam eleifend ex eros, ut lacinia tellus volutpat non. Pellentesque sit amet cursus diam. Maecenas elementum mattis est, in tincidunt ex pretium ac. Integer ultrices nunc rutrum, pretium sapien vitae, lobortis velit.

First This is the first item
Last This is the last item

Donec nec nibh sagittis, finibus mauris quis, laoreet augue. Maecenas aliquam sem nunc, vel semper urna hendrerit nec. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Maecenas pellentesque dolor lacus, sit amet pretium felis vestibulum finibus. Duis tincidunt sapien faucibus nisi vehicula tincidunt. Donec euismod suscipit ligula a tempor. Aenean a nulla sit amet magna ullamcorper condimentum. Fusce eu velit vitae libero varius condimentum at sed dui.

AM and Lars:
Lets delete this paragraph

Aliquam elementum nulla at arcu finibus aliquet. Praesent congue ultrices nisl pretium posuere. Nunc vel nulla hendrerit, ultrices justo ut, ultrices sapien. Duis ut arcu at nunc pellentesque consectetur. Vestibulum eget nisl porta, ultricies orci eget.

This Person say:
Maybe this can go to page 4

Table 9: *Example table*

Name		
First Name	Last Name	Grade
John	Doe	7.5
Richard	Miles	5

References

[1] A. C. Nicholas and H. F. James, "The spread of obesity in a large social network over 32 years," *The New England Journal of Medicine*, 2007. https://www.nejm.org/doi/full/10.1056/NEJMsa066082.

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7 Suplementary material

In this section, we present some useful extra information

7.1 Biomarkers

Acronym	Protein	UniProt	LOD_Batch_20160383	LOD_Batch_20160977	Uniprt_Web	Wiki_Web
ADA	Adenosine Deaminase	P00813	0.436494	1.584419	http://www.uniprot.org/uniprot/P00813	https://en.wikipedia.org/wiki/Adenosine_deaminase
ARTN	Artemin	Q5T4W7	0.031349	0.031349	http://www.uniprot.org/uniprot/Q5T4W7	https://en.wikipedia.org/wiki/Artemin
AXIN1	Axin-1	O15169	0.845030	0.576816	http://www.uniprot.org/uniprot/O15169	https://en.wikipedia.org/wiki/AXIN1
BDNF	Brain-derived neurotrophic factor	P23560	-0.380273	-0.045445	http://www.uniprot.org/uniprot/P23560	https://en.wikipedia.org/wiki/Brain-derived_neurotrophic_factor
BNGF	Beta-nerve growth factor	P01138	0.755167	0.631771	http://www.uniprot.org/uniprot/P01138	
CASP8	Caspase-8	Q14790	0.507711	0.151261	http://www.uniprot.org/uniprot/Q14790	https://en.wikipedia.org/wiki/Caspase_8
CCL11	Eotaxin	P51671	1.427776	0.950032	http://www.uniprot.org/uniprot/P51671	https://en.wikipedia.org/wiki/CCL11
CCL19	C-C motif chemokine 19	Q99731	0.988040	-0.038600	http://www.uniprot.org/uniprot/Q99731	https://en.wikipedia.org/wiki/CCL19
CCL20	C-C motif chemokine 20	P78556	1.276281	1.290873	http://www.uniprot.org/uniprot/P78556	https://en.wikipedia.org/wiki/CCL20
CCL23	C-C motif chemokine 23	P55773	0.780150	0.047888	http://www.uniprot.org/uniprot/P55773	https://en.wikipedia.org/wiki/CCL23
CCL25	C-C motif chemokine 25	O15444	1.083723	0.634603	http://www.uniprot.org/uniprot/O15444	https://en.wikipedia.org/wiki/CCL25
CCL28	C-C motif chemokine 28	Q9NRJ3	0.069990	-0.046866	http://www.uniprot.org/uniprot/Q9NRJ3	https://en.wikipedia.org/wiki/CCL28
CCL3	C-C motif chemokine 3	P10147	-0.077074	-0.524618	http://www.uniprot.org/uniprot/P10147	https://en.wikipedia.org/wiki/CCL3
CCL4	C-C motif chemokine 4	P13236	0.392063	-0.121811	http://www.uniprot.org/uniprot/P13236	https://en.wikipedia.org/wiki/CCL4
CD244	Natural killer cell receptor 2B4	Q9BZW8	1.658169	1.062742	http://www.uniprot.org/uniprot/Q9BZW8	https://en.wikipedia.org/wiki/CD244
CD40	CD40L receptor	P25942	0.757131	-0.447591	http://www.uniprot.org/uniprot/P25942	https://en.wikipedia.org/wiki/CD40_(protein)
CD5	T-cell surface glycoprotein CD5	P06127	-0.487334	-0.578852	http://www.uniprot.org/uniprot/P06127	https://en.wikipedia.org/wiki/CD5_(protein)
CD6	T cell surface glycoprotein CD6 isoform	Q8WWJ7	-0.194972	-0.146330	http://www.uniprot.org/uniprot/Q8WWJ7	https://en.wikipedia.org/wiki/CD6
CDCP1	CUB domain-containing protein 1	Q9H5V8	0.367527	0.038621	http://www.uniprot.org/uniprot/Q9H5V8	https://en.wikipedia.org/wiki/CDCP1
CSF1	Macrophage colony-stimulating factor 1	P09603	-0.003590	0.396328	http://www.uniprot.org/uniprot/P09603	https://en.wikipedia.org/wiki/Macrophage_colony-stimulating_factor
CST5	Cystatin D	P28325	0.046105	5.808007	http://www.uniprot.org/uniprot/P28325	https://en.wikipedia.org/wiki/CST5
CX3CL1	Fractalkine	P78423	1.875148	1.166002	http://www.uniprot.org/uniprot/P78423	https://en.wikipedia.org/wiki/CX3CL1
CXCL1	C-X-C motif chemokine 1	P09341	1.387787	0.758507	http://www.uniprot.org/uniprot/P09341	https://en.wikipedia.org/wiki/CXCL10
CXCL10	C-X-C motif chemokine 10	P02778	1.534295	1.358654	http://www.uniprot.org/uniprot/P02778	https://en.wikipedia.org/wiki/CXCL10
CXCL11	C-X-C motif chemokine 11	O14625	1.471448	0.111323	http://www.uniprot.org/uniprot/O14625	https://en.wikipedia.org/wiki/CXCL11
CXCL5	C-X-C motif chemokine 5	P42830	1.184377	1.639521	http://www.uniprot.org/uniprot/P42830	https://en.wikipedia.org/wiki/CXCL5
CXCL6	C-X-C motif chemokine 6	P80162	0.843005	0.398682	http://www.uniprot.org/uniprot/P80162	https://en.wikipedia.org/wiki/CXCL6
CXCL9	C-X-C motif chemokine 9	Q07325	1.559012	1.430370	http://www.uniprot.org/uniprot/Q07325	https://en.wikipedia.org/wiki/CXCL9
DNER	Delta and Notch-like epidermal growth factor-related receptor	Q8NFT8	-0.127219	-0.730436	http://www.uniprot.org/uniprot/Q8NFT8	https://en.wikipedia.org/wiki/DNER
EIF4EBP1	Eukaryotic translation initiation factor 4E-binding protein 1	Q13541	0.893928	0.969980	http://www.uniprot.org/uniprot/Q13541	https://en.wikipedia.org/wiki/EIF4EBP1
ENRAGE	Protein S100-A12	P80511	0.313350	0.996331	http://www.uniprot.org/uniprot/P80511	https://en.wikipedia.org/wiki/S100A12
FGF19	Fibroblast growth factor 19	O95750	0.662450	0.255022	http://www.uniprot.org/uniprot/O95750	https://en.wikipedia.org/wiki/FGF19
FGF21	Fibroblast growth factor 21	Q9NSA1	0.844435	-0.310457	http://www.uniprot.org/uniprot/Q9NSA1	https://en.wikipedia.org/wiki/FGF21
FGF23	Fibroblast growth factor 23	Q9GZV9	1.039348	1.108382	http://www.uniprot.org/uniprot/Q9GZV9	https://en.wikipedia.org/wiki/FGF23
FGF5	Fibroblast growth factor 5	Q8NF90	1.142597	0.876939	http://www.uniprot.org/uniprot/Q8NF90	https://en.wikipedia.org/wiki/FGF5
FLT3L	Fms-related tyrosine kinase 3 ligand	P49771	1.866726	1.119030	http://www.uniprot.org/uniprot/P49771	https://en.wikipedia.org/wiki/FLT3LG
GDNF	Glial cell line-derived neurotrophic factor	P39905	1.331378	1.648532	http://www.uniprot.org/uniprot/P39905	https://en.wikipedia.org/wiki/Glial_cell_line-derived_neurotrophic_factor
HGF	Hepatocyte growth factor	P14210	1.146276	0.395915	http://www.uniprot.org/uniprot/P14210	https://en.wikipedia.org/wiki/Hepatocyte_growth_factor
IFNG	Interferon gamma	P01579	0.992133	0.992133	http://www.uniprot.org/uniprot/P01579	https://en.wikipedia.org/wiki/Interferon_gamma
IL10	Interleukin-10	P22301	1.839415	2.432488	http://www.uniprot.org/uniprot/P22301	https://en.wikipedia.org/wiki/Interleukin_10
IL10RA	Interleukin-10 receptor subunit alpha	Q13651	0.996689	0.662247	http://www.uniprot.org/uniprot/Q13651	https://en.wikipedia.org/wiki/Interleukin_10_receptor,_alpha_subunit
IL10RB	Interleukin-10 receptor subunit beta	Q08334	1.425411	1.405083	http://www.uniprot.org/uniprot/Q08334	https://en.wikipedia.org/wiki/Interleukin_10_receptor,_beta_subunit
IL12B	Interleukin-12 subunit beta	P29460	-0.338237	-0.143724	http://www.uniprot.org/uniprot/P29460	https://en.wikipedia.org/wiki/Interleukin_12_receptor,_beta_1_subunit
IL13	Interleukin-13	P35225	1.537823	1.537823	http://www.uniprot.org/uniprot/P35225	https://en.wikipedia.org/wiki/Interleukin_13
IL15RA	Interleukin-15 receptor subunit alpha	Q13261	0.783341	0.595480	http://www.uniprot.org/uniprot/Q13261	https://en.wikipedia.org/wiki/Interleukin_15_receptor,_alpha_subunit
IL17A	Interleukin-17A	Q16552	0.532945	0.371852	http://www.uniprot.org/uniprot/Q16552	https://en.wikipedia.org/wiki/IL17A
IL17C	Interleukin-17C	Q9P0M4	1.371362	1.358013	http://www.uniprot.org/uniprot/Q9P0M4	
IL18	Interleukin-18	Q14116	-0.188372	0.365590	http://www.uniprot.org/uniprot/Q14116	https://en.wikipedia.org/wiki/Interleukin_18
IL18R1	Interleukin-18 receptor 1	Q13478	0.933131	0.638867	http://www.uniprot.org/uniprot/Q13478	https://en.wikipedia.org/wiki/Interleukin_18_receptor
IL1A	Interleukin-1 alpha	P01583	0.336995	1.802489	http://www.uniprot.org/uniprot/P01583	https://en.wikipedia.org/wiki/IL1A
IL2	Interleukin-2	P60568	1.223237	1.223237	http://www.uniprot.org/uniprot/P60568	https://en.wikipedia.org/wiki/Interleukin_2
IL20	Interleukin-20	Q9NYY1	0.728374	0.813528	http://www.uniprot.org/uniprot/Q9NYY1	https://en.wikipedia.org/wiki/Interleukin_20
IL20RA	Interleukin-20 receptor subunit alpha	Q9UHF4	0.877718	0.881812	http://www.uniprot.org/uniprot/Q9UHF4	
IL22RA1	Interleukin-22 receptor subunit alpha-1	Q8N6P7	2.260242	2.260242	http://www.uniprot.org/uniprot/Q8N6P7	
IL24	Interleukin-24	Q13007	1.336190	1.336190	http://www.uniprot.org/uniprot/Q13007	https://en.wikipedia.org/wiki/Interleukin_24
IL2RB	Interleukin-2 receptor subunit beta	P14784	0.845790	0.845790	http://www.uniprot.org/uniprot/P14784	https://en.wikipedia.org/wiki/IL2RB
IL33	Interleukin-33	O95760	1.425509	1.425509	http://www.uniprot.org/uniprot/O95760	https://en.wikipedia.org/wiki/Interleukin_33
IL4	Interleukin-4	P05112	1.184842	0.958605	http://www.uniprot.org/uniprot/P05112	https://en.wikipedia.org/wiki/Interleukin_4
IL5	Interleukin-5	P05113	1.725314	1.647055	http://www.uniprot.org/uniprot/P05113	https://en.wikipedia.org/wiki/Interleukin_5
IL6	Interleukin-6	P05231	0.824445	2.415735	http://www.uniprot.org/uniprot/P05231	https://en.wikipedia.org/wiki/Interleukin_6
IL7	Interleukin-7	P13232	1.021735	1.336047	http://www.uniprot.org/uniprot/P13232	https://en.wikipedia.org/wiki/Interleukin_7
IL8	Interleukin-8	P10145	1.162271	2.227435	http://www.uniprot.org/uniprot/P10145	https://en.wikipedia.org/wiki/Interleukin_8
LIF	Leukemia inhibitory factor	P15018	0.800844	0.800844	http://www.uniprot.org/uniprot/P15018	https://en.wikipedia.org/wiki/Leukemia_inhibitory_factor
LIFR	Leukemia inhibitory factor receptor	P42702	1.665534	-0.265929	http://www.uniprot.org/uniprot/P42702	https://en.wikipedia.org/wiki/LIFR
MCP1	Monocyte chemotactic protein 1	P13500	0.358877	-0.161967	http://www.uniprot.org/uniprot/P13500	https://en.wikipedia.org/wiki/Monocyte_chemoattractant_protein_1
MCP2	Monocyte chemotactic protein 2	P80075	1.385177	1.823898	http://www.uniprot.org/uniprot/P80075	
MCP3	Monocyte chemotactic protein 3	P80098	1.493173	1.699734	http://www.uniprot.org/uniprot/P80098	
MCP4	Monocyte chemotactic protein 4	Q99616	-0.265469	-0.298464	http://www.uniprot.org/uniprot/Q99616	
MMP1	Matrix metalloproteinase-1	P03956	-0.024189	-6.622735	http://www.uniprot.org/uniprot/P03956	https://en.wikipedia.org/wiki/Matrix_metalloproteinase
MMP10	Matrix metalloproteinase-10	P09238	1.379258	3.725904	http://www.uniprot.org/uniprot/P09238	https://en.wikipedia.org/wiki/Matrix_metalloproteinase
NRTN	Neurturin	Q99748	1.124936	1.124936	http://www.uniprot.org/uniprot/Q99748	https://en.wikipedia.org/wiki/Neurturin
NT3	Neurotrophin-3	P20783	0.771270	0.918843	http://www.uniprot.org/uniprot/P20783	https://en.wikipedia.org/wiki/Neurotrophin-3
OPG	Osteoprotegerin	O00300	0.918419	0.590118	http://www.uniprot.org/uniprot/O00300	https://en.wikipedia.org/wiki/Osteoprotegerin
OSM	Oncostatin-M	P13725	-0.153103	-0.025163	http://www.uniprot.org/uniprot/P13725	https://en.wikipedia.org/wiki/Oncostatin_M
PDL1	Programmed cell death 1 ligand 1	Q9NZQ7	2.257393	2.092503	http://www.uniprot.org/uniprot/Q9NZQ7	https://en.wikipedia.org/wiki/PD-L1
SCF	Stem cell factor	P21583	0.922578	0.051798	http://www.uniprot.org/uniprot/P21583	https://en.wikipedia.org/wiki/Stem_cell_factor
SIRT2	SIR2-like protein 2	Q8IXJ6	1.402289	1.386472	http://www.uniprot.org/uniprot/Q8IXJ6	
SLAMF1	Signaling lymphocytic activation molecule	Q13291	1.849931	1.677337	http://www.uniprot.org/uniprot/Q13291	https://en.wikipedia.org/wiki/Signaling_lymphocytic_activation_molecule
ST1A1	Sulfotransferase 1A1	P50225	0.078597	0.568043	http://www.uniprot.org/uniprot/P50225	https://en.wikipedia.org/wiki/SULT1A1
STAMBP	STAM-binding protein	O95630	0.667136	0.627816	http://www.uniprot.org/uniprot/O95630	https://en.wikipedia.org/wiki/STAMBP
TGFA	Transforming growth factor alpha	P01135	-1.214780	-1.869967	http://www.uniprot.org/uniprot/P01135	https://en.wikipedia.org/wiki/TGF_alpha
TGFB1	Latency-associated peptide transforming growth factor beta-1	P01137	1.034369	0.482168	http://www.uniprot.org/uniprot/P01137	https://en.wikipedia.org/wiki/TGF_beta_1
TNF	Tumor necrosis factor	P01375	0.831819	0.837656	http://www.uniprot.org/uniprot/P01375	https://en.wikipedia.org/wiki/Tumor_necrosis_factor
TNFB	TNF-beta	P01374	0.605630	0.200990	http://www.uniprot.org/uniprot/P01374	https://en.wikipedia.org/wiki/Lymphotoxin_alpha
TNFRSF9	Tumor necrosis factor receptor superfamily member 9	Q07011	1.599546	1.466786	http://www.uniprot.org/uniprot/Q07011	https://en.wikipedia.org/wiki/4-1BB_ligand
TNFSF14	Tumor necrosis factor ligand superfamily member 14	O43557	0.210933	-0.170624	http://www.uniprot.org/uniprot/O43557	https://en.wikipedia.org/wiki/LIGHT_(protein)
TRAIL	TNF-related apoptosis-inducing ligand	P50591	0.651508	0.548601	http://www.uniprot.org/uniprot/P50591	https://en.wikipedia.org/wiki/TRAIL
TRANCE	TNF-related activation-induced cytokine	O14788	1.263670	1.118725	http://www.uniprot.org/uniprot/O14788	https://en.wikipedia.org/wiki/Receptor_activator_of_nuclear_factor_kappa-B_ligand
TSLP	Thymic stromal lymphopoietin	Q969D9	1.080835	1.080835	http://www.uniprot.org/uniprot/Q969D9	https://en.wikipedia.org/wiki/Thymic_stromal_lymphopoietin
TWEAK	Tumor necrosis factor	O43508	0.511139	0.439180	http://www.uniprot.org/uniprot/O43508	https://en.wikipedia.org/wiki/Tumor_necrosis_factor
UPA	Urokinase-type plasminogen activator	P00749	0.767444	0.691054	http://www.uniprot.org/uniprot/P00749	https://en.wikipedia.org/wiki/Urokinase
VEGFA	Vascular endothelial growth factor A	P15692	1.566666	1.233603	http://www.uniprot.org/uniprot/P15692	https://en.wikipedia.org/wiki/Vascular_endothelial_growth_factor

Table 10: *Summary of all biomarkers*

Acronym	Protein	Significance	Men	Women
ADA	Adenosine Deaminase	****	5.16	4.75
ARTN	Artemin	ns	-0.21	-0.22
AXIN1	Axin-1	****	1.19	1.07
BDNF	Brain-derived neurotrophic factor	***	4.61	3.76
BNGF	Beta-nerve growth factor	ns	1.93	1.93
CASP8	Caspase-8	*	1.46	1.4
CCL11	Eotaxin	****	7.9	7.76
CCL19	C-C motif chemokine 19	ns	9.37	9.37
CCL20	C-C motif chemokine 20	ns	6.06	6.06
CCL23	C-C motif chemokine 23	ns	9.35	9.39
CCL25	C-C motif chemokine 25	**	6.17	6.05
CCL28	C-C motif chemokine 28	****	0.83	1.26
CCL3	C-C motif chemokine 3	ns	2.24	2.2
CCL4	C-C motif chemokine 4	****	6.58	6.44
CD244	Natural killer cell receptor 2B4	***	6.38	6.31
CD40	CD40L receptor	****	9.29	9.18
CD5	T-cell surface glycoprotein CD5	**	4.05	3.99
CD6	T cell surface glycoprotein CD6 isoform	ns	3.65	3.59
CDCP1	CUB domain-containing protein 1	ns	2.44	2.41
CSF1	Macrophage colony-stimulating factor 1	*	7.87	7.9
CST5	Cystatin D	****	6.87	6.75
CX3CL1	Fractalkine	ns	6.52	6.52
CXCL1	C-X-C motif chemokine 1	****	8.72	8.85
CXCL10	C-X-C motif chemokine 10	ns	9.51	9.6
CXCL11	C-X-C motif chemokine 11	**	7.1	7.24
CXCL5	C-X-C motif chemokine 5	****	12.1	12.53
CXCL6	C-X-C motif chemokine 6	ns	9.08	9.02
CXCL9	C-X-C motif chemokine 9	ns	7.29	7.28
DNER	Delta and Notch-like epidermal growth factor-related receptor	****	7.35	7.27
EIF4EBP1	Eukaryotic translation initiation factor 4E-binding protein 1	****	5.99	5.5
ENRAGE	Protein S100-A12	ns	5.16	5.11
FGF19	Fibroblast growth factor 19	ns	7.88	7.87
FGF21	Fibroblast growth factor 21	ns	3.16	3.13
FGF23	Fibroblast growth factor 23	ns	2.68	2.63
FGF5	Fibroblast growth factor 5	ns	1.42	1.43
FLT3L	Fms-related tyrosine kinase 3 ligand	*	8.78	8.83
GDNF	Glial cell line-derived neurotrophic factor	***	2.17	2.08
HGF	Hepatocyte growth factor	****	7.8	7.91
IFNG	Interferon gamma	ns	0.62	0.63
IL10	Interleukin-10	ns	4.14	4.11
IL10RA	Interleukin-10 receptor subunit alpha	ns	1.41	1.37
IL10RB	Interleukin-10 receptor subunit beta	****	7.61	7.47
IL12B	Interleukin-12 subunit beta	ns	4.81	4.85
IL13	Interleukin-13	ns	1.06	1.02
IL15RA	Interleukin-15 receptor subunit alpha	****	1.31	1.22
IL17A	Interleukin-17A	ns	0.83	0.8
IL17C	Interleukin-17C	****	1.72	1.58
IL18	Interleukin-18	ns	7.07	7.02
IL18R1	Interleukin-18 receptor 1	**	7.61	7.53
IL1A	Interleukin-1 alpha	***	1.04	1.18
IL2	Interleukin-2	ns	0.74	0.74
IL20	Interleukin-20	ns	0.54	0.52
IL20RA	Interleukin-20 receptor subunit alpha	ns	0.75	0.73
IL22RA1	Interleukin-22 receptor subunit alpha-1	ns	0.33	0.3
IL24	Interleukin-24	ns	0.73	0.72
IL2RB	Interleukin-2 receptor subunit beta	ns	0.52	0.51
IL33	Interleukin-33	ns	0.97	0.98
IL4	Interleukin-4	****	1.13	0.85
IL5	Interleukin-5	**	1.73	1.95
IL6	Interleukin-6	ns	2.85	2.84
IL7	Interleukin-7	ns	5.27	5.21
IL8	Interleukin-8	ns	7.56	7.52
LIF	Leukemia inhibitory factor	ns	0.46	0.46
LIFR	Leukemia inhibitory factor receptor	ns	3.4	3.38
MCP1	Monocyte chemotactic protein 1	****	10.01	9.79
MCP2	Monocyte chemotactic protein 2	ns	10.03	10.02
MCP3	Monocyte chemotactic protein 3	ns	2.23	2.25
MCP4	Monocyte chemotactic protein 4	ns	3.47	3.42
MMP1	Matrix metalloproteinase-1	ns	6.86	6.95
MMP10	Matrix metalloproteinase-10	**	8.83	8.95
NRTN	Neurturin	ns	0.91	0.94
NT3	Neurotrophin-3	**	2.19	2.09
OPG	Osteoprotegerin	ns	9.68	9.71
OSM	Oncostatin-M	****	4.42	4.79
PDL1	Programmed cell death 1 ligand 1	****	5.07	4.87
SCF	Stem cell factor	****	9.28	9.15
SIRT2	SIR2-like protein 2	**	3.01	2.9
SLAMF1	Signaling lymphocytic activation molecule	****	3.2	3.05
ST1A1	Sulfotransferase 1A1	ns	2.04	2
STAMBP	STAM-binding protein	****	2.74	2.58
TGFA	Transforming growth factor alpha	****	3.59	3.88
TGFB1	Latency-associated peptide transforming growth factor beta-1	****	8.1	7.99
TNF	Tumor necrosis factor	ns	0.47	0.45
TNFB	TNF-beta	ns	3.99	3.98
TNFRSF9	Tumor necrosis factor receptor superfamily member 9	****	7.19	6.68
TNFSF14	Tumor necrosis factor ligand superfamily member 14	**	4.62	4.71
TRAIL	TNF-related apoptosis-inducing ligand	****	8.39	8.18
TRANCE	TNF-related activation-induced cytokine	****	5.97	5.5
TSLP	Thymic stromal lymphopoietin	ns	0.42	0.46
TWEAK	Tumor necrosis factor	****	9.02	8.88
UPA	Urokinase-type plasminogen activator	****	10.07	9.87
VEGFA	Vascular endothelial growth factor A	ns	10.2	10.22

Table 11: *Sex differences for each biomarker*

Sex	Man		Woman		Total	Freq
Man	530	(0.51)	0	(0)	530	0.51
Woman	0	(0)	508	(0.49)	508	0.49
Total	530		508		1038	
Freq		0.51		0.49		1

Table 12: *Sex differences for Sex*

GeneralHealth	Very bad		Bad		Neither good nor bad		Good		Excellent		Tot
Man	3	(0)	23	(0.02)	110	(0.11)	261	(0.26)	125	(0.12)	522
Woman	4	(0)	30	(0.03)	108	(0.11)	236	(0.23)	116	(0.11)	494
Total	7		53		218		497		241		101
Freq		0.01		0.05		0.21		0.49		0.24	

Table 13: *Sex differences for GeneralHealth*

BMICategorical	Underweight		Healthy		Overweight		Obese		Total	Freq
Man	67	(0.06)	351	(0.34)	78	(0.08)	33	(0.03)	529	0.51
Woman	43	(0.04)	359	(0.35)	69	(0.07)	34	(0.03)	505	0.49
Total	110		710		147		67		1034	
Freq		0.11		0.69		0.14		0.06		1

Table 14: *Sex differences for BMICategorical*

Smoke	Never		Sometimes		Daily		Total	Freq
Man	393	(0.39)	107	(0.11)	20	(0.02)	520	0.51
Woman	389	(0.38)	81	(0.08)	28	(0.03)	498	0.49
Total	782		188		48		1018	
Freq		0.77		0.18		0.05		1

Table 15: *Sex differences for Smoke*

Snuff	Never		Sometimes		Daily		Total	Freq
Man	306	(0.3)	64	(0.06)	149	(0.15)	519	0.51
Woman	336	(0.33)	67	(0.07)	96	(0.09)	499	0.49
Total	642		131		245		1018	
Freq		0.63		0.13		0.24		1

Table 16: *Sex differences for Snuff*

Alcohol	Never		Once per month or less		Twice of more per month		Total	Freq
Man	161	(0.16)	193	(0.19)	164	(0.16)	518	0.51
Woman	119	(0.12)	227	(0.22)	154	(0.15)	500	0.49
Total	280		420		318		1018	
Freq		0.28		0.41		0.31		1

Table 17: *Sex differences for Alcohol*

SportsLeisure	None		Light		Medium		Hard		Total	Freq
Man	154	(0.15)	132	(0.13)	120	(0.12)	114	(0.11)	520	0.51
Woman	75	(0.07)	206	(0.2)	139	(0.14)	80	(0.08)	500	0.49
Total	229		338		259		194		1020	
Freq		0.22		0.33		0.25		0.19		1

Table 18: *Sex differences for SportsLeisure*

SummerTransport	By car or moped		By bus		By bike		On foot		Uknown		
Man	73	(0.07)	341	(0.33)	36	(0.03)	70	(0.07)	10	(0.01)	5
Woman	46	(0.04)	345	(0.33)	23	(0.02)	86	(0.08)	8	(0.01)	5
Total	119		686		59		156		18		1
Freq		0.11		0.66		0.06		0.15		0.02	

Table 19: *Sex differences for SummerTransport*

WinterTransport	By car or moped		By bus		By bike		On foot		Uknown		To
Man	44	(0.04)	388	(0.37)	6	(0.01)	69	(0.07)	23	(0.02)	53
Woman	38	(0.04)	384	(0.37)	5	(0)	70	(0.07)	11	(0.01)	50
Total	82		772		11		139		34		10
Freq		0.08		0.74		0.01		0.13		0.03	

Table 20: *Sex differences for WinterTransport*

ScreenTime	None		About half an hour		About 1 to 1,5 hours		About 2 to 3 hours		Abou
Man	0	(0)	21	(0.02)	84	(0.08)	185	(0.18)	183
Woman	1	(0)	21	(0.02)	90	(0.09)	201	(0.19)	141
Total	1		42		174		386		324
Freq		0		0.04		0.17		0.37	

Table 21: *Sex differences for ScreenTime*

LeanFishFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per wee
Man	106	(0.1)	235	(0.23)	152	(0.15)	15
Woman	113	(0.11)	226	(0.22)	136	(0.13)	18
Total	219		461		288		33
Freq		0.21		0.44		0.28	

Table 22: *Sex differences for LeanFishFrequency*

FatFishFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per week
Man	124	(0.12)	235	(0.23)	133	(0.13)	26
Woman	101	(0.1)	239	(0.23)	133	(0.13)	17
Total	225		474		266		43
Freq		0.22		0.46		0.26	

Table 23: *Sex differences for FatFishFrequency*

CheeseFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per week
Man	28	(0.03)	81	(0.08)	201	(0.19)	149
Woman	25	(0.02)	83	(0.08)	198	(0.19)	126
Total	53		164		399		275
Freq		0.05		0.16		0.38	

Table 24: *Sex differences for CheeseFrequency*

ChocolateFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per we
Man	35	(0.03)	120	(0.12)	294	(0.28)	56
Woman	37	(0.04)	131	(0.13)	254	(0.24)	55
Total	72		251		548		111
Freq		0.07		0.24		0.53	

Table 25: *Sex differences for ChocolateFrequency*

FruitsFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per week
Man	19	(0.02)	61	(0.06)	161	(0.16)	122
Woman	27	(0.03)	56	(0.05)	156	(0.15)	97
Total	46		117		317		219
Freq		0.04		0.11		0.31	

Table 26: *Sex differences for FruitsFrequency*

VegetablesFrequency	Rarely/Never		1-3 times per month		1-3 times per week		4-6 times per w
Man	22	(0.02)	49	(0.05)	132	(0.13)	160
Woman	21	(0.02)	43	(0.04)	119	(0.11)	159
Total	43		92		251		319
Freq		0.04		0.09		0.24	

Table 27: *Sex differences for VegetablesFrequency*

DairyFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses per day	
Man	269	(0.26)	200	(0.19)	30	(0.03)	18	(0
Woman	269	(0.26)	173	(0.17)	28	(0.03)	21	(0
Total	538		373		58		39	
Freq		0.52		0.36		0.06		0.0

Table 28: *Sex differences for DairyFrequency*

FruitJuiceFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses per day
Man	90	(0.09)	227	(0.22)	120	(0.12)	67
Woman	73	(0.07)	257	(0.25)	91	(0.09)	68
Total	163		484		211		135
Freq		0.16		0.47		0.2	

Table 29: *Sex differences for FruitJuiceFrequency*

SugarJuiceFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses per day
Man	315	(0.3)	148	(0.14)	35	(0.03)	18
Woman	294	(0.28)	148	(0.14)	28	(0.03)	22
Total	609		296		63		40
Freq		0.59		0.29		0.06	

Table 30: *Sex differences for SugarJuiceFrequency*

SugarDrinkFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses per day
Man	112	(0.11)	276	(0.27)	61	(0.06)	47
Woman	110	(0.11)	264	(0.25)	61	(0.06)	41
Total	222		540		122		88
Freq		0.21		0.52		0.12	

Table 31: *Sex differences for SugarDrinkFrequency*

SweetenerDrinkFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses pe
Man	286	(0.28)	182	(0.18)	27	(0.03)	11
Woman	282	(0.27)	154	(0.15)	36	(0.03)	13
Total	568		336		63		24
Freq		0.55		0.32		0.06	

Table 32: *Sex differences for SweetenerDrinkFrequency*

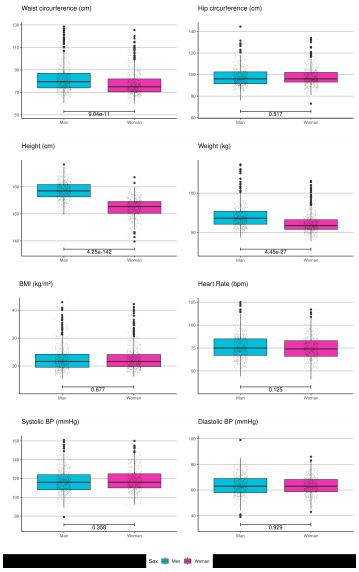

Figure 4: *Overview of all antropometric variables diferences with respect sex.*

WaterFrequency	Rarely/Never		1-6 glasses per week		1 glass per day		2-3 glasses per day	
Man	10	(0.01)	48	(0.05)	86	(0.08)	163	(0
Woman	8	(0.01)	30	(0.03)	78	(0.08)	174	(0
Total	18		78		164		337	
Freq		0.02		0.08		0.16		0.

Table 33: *Sex differences for WaterFrequency*

HighSchool	H1		H2		H3		H4		H5		H6		H7		H8	
Man	135	(0.13)	36	(0.03)	62	(0.06)	63	(0.06)	38	(0.04)	16	(0.02)	102	(0.1)	78	(0
Woman	72	(0.07)	106	(0.1)	106	(0.1)	35	(0.03)	47	(0.05)	10	(0.01)	90	(0.09)	42	(0
Total	207		142		168		98		85		26		192		120	
Freq		0.2		0.14		0.16		0.09		0.08		0.03		0.18		0

Table 34: *Sex differences for HighSchool*

7.2 Antropometry

7.3 Host factors tables

7.4 Blood

7.5 Biomarkers signficance without correction

Description	Short	Unit	Lower Limit	Upper Limit	$\bar{x}_{men}$	$\bar{x}_{women}$	Significance	Freq_Men_Out	Freq_Women_Out
Mean corposcular hemoglobin (pg). EDTA whole blood	MCH	pg	26.08	32.3	29.25	29.12	ns	2.2%	6.2%
Mean corposcular hemoglobin concentration (g/dL). EDTA whole blood	MCHC	g/dL	32.23	34.85	33.68	33.39	****	4.2%	7.4%
Mean corposcular volume (fl). EDTA whole blood	MCV	fl	78.03	95.53	87.09	86.43	*	2.1%	7.2%
Fe (µmol/L). Serum	Fe	umol/L	2.09	31.69	18.47	15.18	****	3.8%	2%
Ferritin (ug/L). Serum	Ferritin	ug/L	-21.95	112.37	57.6	31.42	****	6.3%	0.7%
Transferrin (g/L). Serum	Transferritin	g/L	2.04	3.79	2.83	3.02	****	2.9%	8.6%
Total cholesterol (mmol/L). Serum	Total cholesterol	mmol/L	2.54	5.61	3.91	4.25	****	3.4%	3.6%
Triglycerides (mmol/L). Serum	Tryglicerides	mmol/L	0.05	2.13	1.13	1.05	*	5.9%	3.2%
Low density lipoprotein cholesterol (mmol/L). Serum	LDL	mmol/L	1.01	3.75	2.3	2.46	***	4%	4.1%
High density lipoprotein cholesterol (mmol/L). Serum	HDL	mmol/L	0.7	1.98	1.24	1.45	****	1.9%	7.3%
Calcium (mmol/L). Serum	Calcium	mmol/L	2.15	2.48	2.34	2.29	****	5.1%	5%
High-sensitive CRP. Serum	hs-CRP		-5.11	8.15	1.49	1.55	ns	3.6%	3%
Apolipoprotein A1 (g/L). Serum	APO A	g/L	0.88	1.71	1.22	1.37	****	3.8%	7.5%
Apolipoprotein B (g/L). Serum	APO B	g/L	0.3	0.97	0.61	0.66	****	3.8%	4.1%
Serum estradiol, E2 (nmol/L)	Estradiol	nmol/L	-0.54	0.93	0.11	0.29	****	0%	2.9%
Serum progesterone (nmol/L)	Progesterone	nmol/L	-9.19	15.18	1.81	4.32	****	0%	7.2%
Serum testosterone (nmol/L)	Testosterone	nmol/L	-7.41	24.23	15.12	0.9	****	3.4%	0%
Serum dehydroepiandrostenedione sulphate (µmol/L)	DHEA	umol/L	1.29	11.83	7.24	5.8	****	6.5%	1.4%
Serum sex hormone binding globuline (SHBG) (nmol/L)	SHBG	nmol/L	0	200	28.69	66.61	****	0%	0%
Serum luteinizing hormone (LH) (IU/L)	LH	IU/L	-4.88	15.17	4.22	6.18	****	0.2%	6.3%
Serum follicle-stimulating hormone (FSH) (IU/L)	Follicle-stimulating hormone	IU/L	-1.03	8.7	3.62	4.07	**	2.2%	2%
Glucose (mmol/L). Non-fasting serum	Glucose non fasting	mmol/L	70	120	5.16	4.95	***	100%	100%
Glycated haemoglobin (%). EDTA whole blood	HBA1C	%	4.65	5.93	5.29	5.29	ns	1.9%	3.5%
Haemoglobin (g/dL). EDTA whole blood	HBA	g/dL	10.98	16.36	14.59	12.65	****	1.9%	3.9%
Albumin (g/L). Serum	Albumin	g/L	40.62	50.83	46.85	44.51	****	4.2%	6.6%
25(OH)D (nmol/L). Serum	25(OH)D	nmol/L	0.42	92.88	40.13	53.89	****	2.2%	7.2%
Retinol (µmol/L). Serum	Retinol	umol/L	0.62	4.32	2.46	2.49	ns	3.2%	5.4%
Plasma Parathyroid hormone (pmol/L)	PTH	pmol/L	1.25	7.19	4.43	3.99	****	5.1%	2.3%
FA C12:0 (mcg/ml). Serum	FA C12:0	mcg/ml	-21.76	32.95	5.71	5.47	ns	1.6%	0.9%
FA C14:0 (mcg/ml). Serum	FA C14:0	mcg/ml	-10.61	72.5	30.9	30.99	ns	4.1%	4.7%
FA C15:0 (mcg/ml). Serum	FA C15:0	mcg/ml	1.07	9.86	5.45	5.48	ns	3.2%	4.5%
FA C16:0 (mcg/ml). Serum	FA C16:0	mcg/ml	191.56	960.72	564.26	589.33	*	4.9%	6.3%
FA C16:1 n-7 (mcg/ml). Serum	FA C16:1 n-7	mcg/ml	-7.29	106.81	46.61	53.26	***	3%	5.6%
FA C18:0 (mcg/ml). Serum	FA C18:0	mcg/ml	76.01	322.85	195.89	203.35	ns	4.3%	6.3%
FA C18:1 t6-11 (mcg/ml). Serum	FA C18:1 t6-11	mcg/ml	-6.12	47.68	20.95	20.59	ns	4.5%	5%
FA C18:1 c-9 (mcg/ml). Serum	FA C18:1 c-9	mcg/ml	132.36	926.21	537.94	519.67	ns	5.1%	4.3%
FA C18:1 c-11(mcg/ml). Serum	FA C18:1 c-11	mcg/ml	11.53	63.91	36.78	38.76	*	4.1%	6.1%
FA C18:2 n-6 (mcg/ml). Serum	FA C18:2 n-6	mcg/ml	310.87	1022.44	645.65	689.97	***	3.2%	5.9%
FA C20:0 (mcg/ml). Serum	FA C20:0	mcg/ml	2.39	14.16	7.56	9.07	****	2.6%	8.3%
FA C18:3 n-6 (mcg/ml). Serum	FA C18:3 n-6	mcg/ml	-1.41	17.68	8.23	8.04	ns	4.1%	5.6%
FA C18:3 n-3 (mcg/ml). Serum	FA C18:3 n-3	mcg/ml	-3.45	38.63	17.98	17.16	ns	4.7%	2.9%
FA C20:1 n-9 (mcg/ml). Serum	FA C20:1 n-9	mcg/ml	0.03	7.2	3.63	3.6	ns	4.1%	5.2%
FA C20:2 n-6 (mcg/ml). Serum	FA C20:2 n-6	mcg/ml	1.06	8.46	4.51	5.03	****	2.2%	7.7%
FA C22:0 (mcg/ml). Serum	FA C22:0	mcg/ml	7.73	26.89	16.29	18.44	****	2%	7.9%
FA C20:3 n-6 (mcg/ml). Serum	FA C20:3 n-6	mcg/ml	9.08	65.8	36.59	38.38	ns	2.4%	5.2%
FA C20:4 n-6 (mcg/ml). Serum	FA C20:4 n-6	mcg/ml	53.09	199.38	122.54	130.34	**	3.7%	5.9%
FA C23:0 (mcg/ml). Serum	FA C23:0	mcg/ml	2.97	11.23	6.6	7.65	****	1.8%	7.7%
FA C20:5 n-3 (mcg/ml). Serum	FA C20:5 n-3	mcg/ml	-8.06	46.77	18.51	20.3	*	3.9%	4.1%
FA C24:0 (mcg/ml). Serum	FA C24:0	mcg/ml	6.8	24.82	15.25	16.43	****	2.2%	7.2%
FA C24:1 (mcg/ml). Serum	FA C24:1	mcg/ml	13.93	44.18	27.34	30.95	****	2.4%	8.1%
FA C22:5 n-3 (mcg/ml). Serum	FA C22:5 n-3	mcg/ml	4.25	21.44	13.26	12.39	**	4.9%	3.8%
FA C22:6 n-3 (mcg/ml). Serum	FA C22:6 n-3	mcg/ml	11.93	94.5	49.07	57.82	****	3%	8.1%
FA C12:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C12:0	w%	-0.5	0.89	0.2	0.19	ns	1.6%	0.7%
FA C14:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C14:0	w%	0.12	2.13	1.15	1.1	ns	5.3%	3.4%
FA C15:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C15:0	w%	0.12	0.3	0.21	0.2	**	6.1%	2.5%
FA C16:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C16:0	w%	18.57	25.28	21.88	21.97	ns	4.7%	5.2%
FA C16:1 n-7 (weight% of Fatty Acid Methyl Esters). Serum	wFA C16:1 n-7	w%	0.59	3.1	1.77	1.93	****	3.2%	5.4%
FA C18:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:0	w%	5.93	9.37	7.66	7.64	ns	3.7%	5.9%
FA C18:1 t6-11 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:1 t6-11	w%	0.03	1.5	0.79	0.74	*	6.9%	4.5%
FA C18:1 c-9 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:1 c-9	w%	14.3	25.8	20.68	19.34	****	5.5%	3.8%
FA C18:1 c-11(weight% of Fatty Acid Methyl Esters). Serum	wFA C18:1 c-11	w%	0.96	1.93	1.44	1.46	ns	3.2%	5.9%
FA C18:2 n-6 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:2 n-6	w%	19.15	32.66	25.58	26.26	**	5.5%	4.1%
FA C20:0 (weight% of Fatty Acid Methyl Esters). Serum	wFA C20:0	w%	0.17	0.47	0.3	0.34	****	2.6%	10.6%
FA C18:3 n-6 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:3 n-6	w%	0.03	0.58	0.32	0.3	*	5.1%	3.8%
FA C18:3 n-3 (weight% of Fatty Acid Methyl Esters). Serum	wFA C18:3 n-3	w%	0.14	1.17	0.68	0.63	**	5.9%	3.4%
FA C20:1 n-9 (weight% of Fatty Acid Methyl Esters) Serum	wFA C20:1 n-9	w%	0.04	0.23	0.14	0.13	*	3%	4.7%
FA C20:2 n-6 (weight% of Fatty Acid Methyl Esters) Serum	wFA C20:2 n-6	w%	0.11	0.26	0.18	0.19	****	2%	6.5%
FA C22:0 (weight% of Fatty Acid Methyl Esters) Serum	wFA C22:0	w%	0.41	0.94	0.65	0.7	****	5.5%	4.5%
FA C20:3 n-6 (weight% of Fatty Acid Methyl Esters) Serum	wFA C20:3 n-6	w%	0.81	2.06	1.44	1.43	ns	5.5%	4.5%
FA C20:4 n-6 (weight% of Fatty Acid Methyl Esters) Serum	wFA C20:4 n-6	w%	2.93	6.95	4.9	4.98	ns	4.7%	3.2%
FA C23:0 (weight% of Fatty Acid Methyl Esters) Serum	wFA C23:0	w%	0.16	0.39	0.26	0.29	****	3.4%	5.2%
FA C20:5 n-3 (weight% of Fatty Acid Methyl Esters) Serum	wFA C20:5 n-3	w%	-0.32	1.84	0.74	0.78	ns	3.7%	4.1%
FA C24:0 (weight% of Fatty Acid Methyl Esters) Serum	wFA C24:0	w%	0.35	0.88	0.61	0.63	ns	3.7%	3.8%
FA C24:1 (weight% of Fatty Acid Methyl Esters) Serum	wFA C24:1	w%	0.64	1.65	1.11	1.19	****	4.7%	5%
FA C22:5 n-3 (weight% of Fatty Acid Methyl Esters) Serum	wFA C22:5 n-3	w%	0.26	0.74	0.52	0.47	****	4.3%	4.3%
FA C22:6 n-3 (weight% of Fatty Acid Methyl Esters) Serum	wFA C22:6 n-3	w%	0.68	3.49	1.97	2.21	****	3%	5.2%

Table 35: *Summary of all blood variables*

Variable	Biomarker	Men	Women
Alcohol	Adenosine Deaminase	*	ns
Alcohol	Artemin	*	ns
Alcohol	Delta and Notch-like epidermal growth factor-related receptor	***	**
Alcohol	Fibroblast growth factor 19	*	ns
Alcohol	Fibroblast growth factor 21	**	ns
Alcohol	Interleukin-33	*	ns
Alcohol	Osteoprotegerin	*	ns
Alcohol	Oncostatin-M	*	*
Alcohol	TNF-beta	*	ns
Alcohol	Tumor necrosis factor ligand superfamily member 14	*	ns
Alcohol	Tumor necrosis factor	**	*
Alcohol	CUB domain-containing protein 1	ns	**
Alcohol	Cystatin D	ns	*
Alcohol	C-X-C motif chemokine 6	ns	*
Alcohol	C-X-C motif chemokine 9	ns	*
Alcohol	Fibroblast growth factor 5	ns	***
Alcohol	Glial cell line-derived neurotrophic factor	ns	*
Alcohol	Interleukin-10	ns	*
Alcohol	Interleukin-20	ns	**
Alcohol	Interleukin-4	ns	*
Alcohol	Leukemia inhibitory factor receptor	ns	**
Alcohol	Monocyte chemotactic protein 3	ns	*
Alcohol	Monocyte chemotactic protein 4	ns	*
Alcohol	Matrix metalloproteinase-10	ns	*
Alcohol	Neurotrophin-3	ns	*
Alcohol	Stem cell factor	ns	*
Alcohol	Signaling lymphocytic activation molecule	ns	**
Alcohol	TNF-related activation-induced cytokine	ns	**
Alcohol	Urokinase-type plasminogen activator	ns	***
BMICategorical	C-C motif chemokine 3	****	**
BMICategorical	C-C motif chemokine 4	**	*
BMICategorical	CUB domain-containing protein 1	****	****
BMICategorical	Macrophage colony-stimulating factor 1	**	***
BMICategorical	Delta and Notch-like epidermal growth factor-related receptor	*	***
BMICategorical	Fibroblast growth factor 19	*	ns
BMICategorical	Fibroblast growth factor 21	***	**
BMICategorical	Fibroblast growth factor 5	*	ns
BMICategorical	Glial cell line-derived neurotrophic factor	***	**
BMICategorical	Hepatocyte growth factor	****	****
BMICategorical	Interleukin-18	****	***
BMICategorical	Interleukin-18 receptor 1	****	****
BMICategorical	Interleukin-4	*	ns
BMICategorical	Interleukin-6	****	****
BMICategorical	Interleukin-7	**	**
BMICategorical	Monocyte chemotactic protein 3	****	****
BMICategorical	Monocyte chemotactic protein 4	*	****
BMICategorical	Matrix metalloproteinase-1	***	ns
BMICategorical	Oncostatin-M	**	*
BMICategorical	Stem cell factor	****	ns
BMICategorical	Tumor necrosis factor receptor superfamily member 9	***	ns
BMICategorical	Tumor necrosis factor ligand superfamily member 14	*	ns
BMICategorical	Vascular endothelial growth factor A	**	****
BMICategorical	Caspase-8	ns	**
BMICategorical	C-C motif chemokine 25	ns	*
BMICategorical	T-cell surface glycoprotein CD5	ns	*
BMICategorical	Fractalkine	ns	**
BMICategorical	C-X-C motif chemokine 5	ns	*
BMICategorical	Interleukin-10 receptor subunit beta	ns	***
BMICategorical	Interleukin-17C	ns	*
BMICategorical	Interleukin-2	ns	*
BMICategorical	Monocyte chemotactic protein 1	ns	*
BMICategorical	Neurotrophin-3	ns	*
BMICategorical	TNF-related apoptosis-inducing ligand	ns	***
BMICategorical	TNF-related activation-induced cytokine	ns	*

Table 36: *Biomarkers that are statistically significant for either men or women (1 of 8)*

Variable	Biomarker	Men	Women
CheeseFrequency	Eotaxin	*	ns
CheeseFrequency	Leukemia inhibitory factor	*	*
CheeseFrequency	Matrix metalloproteinase-1	*	*
CheeseFrequency	Beta-nerve growth factor	ns	*
CheeseFrequency	Macrophage colony-stimulating factor 1	ns	*
CheeseFrequency	Fractalkine	ns	*
CheeseFrequency	Stem cell factor	ns	**
ChocolateFrequency	Eukaryotic translation initiation factor 4E-binding protein 1	**	ns
ChocolateFrequency	Interleukin-33	*	ns
ChocolateFrequency	C-C motif chemokine 3	ns	*
ChocolateFrequency	Interleukin-17A	ns	*
ChocolateFrequency	Interleukin-2	ns	**
ChocolateFrequency	Leukemia inhibitory factor receptor	ns	***
ChocolateFrequency	Stem cell factor	ns	*
ChocolateFrequency	SIR2-like protein 2	ns	*
ChocolateFrequency	STAM-binding protein	ns	*
D_NasalCarrier	Adenosine Deaminase	*	ns
D_NasalCarrier	Brain-derived neurotrophic factor	*	ns
D_NasalCarrier	Macrophage colony-stimulating factor 1	*	ns
D_NasalCarrier	Glial cell line-derived neurotrophic factor	*	ns
D_NasalCarrier	Interleukin-10 receptor subunit beta	*	ns
D_NasalCarrier	Interleukin-5	*	ns
D_NasalCarrier	Monocyte chemotactic protein 1	*	ns
D_NasalCarrier	Tumor necrosis factor receptor superfamily member 9	*	ns
D_NasalCarrier	Artemin	ns	*
D_NasalCarrier	Natural killer cell receptor 2B4	ns	*
D_NasalCarrier	CUB domain-containing protein 1	ns	*
D_NasalCarrier	C-X-C motif chemokine 10	ns	*
D_NasalCarrier	Signaling lymphocytic activation molecule	ns	*
D_ThroatCarrier	Caspase-8	**	ns
D_ThroatCarrier	C-C motif chemokine 19	*	ns
D_ThroatCarrier	Eukaryotic translation initiation factor 4E-binding protein 1	*	ns
D_ThroatCarrier	Monocyte chemotactic protein 2	*	ns
D_ThroatCarrier	SIR2-like protein 2	*	ns
D_ThroatCarrier	STAM-binding protein	*	ns
D_ThroatCarrier	C-C motif chemokine 25	ns	*
D_ThroatCarrier	Natural killer cell receptor 2B4	ns	*
D_ThroatCarrier	Fractalkine	ns	*
D_ThroatCarrier	Glial cell line-derived neurotrophic factor	ns	**
D_ThroatCarrier	Interleukin-15 receptor subunit alpha	ns	*
D_ThroatCarrier	Interleukin-1 alpha	ns	*
D_ThroatCarrier	Tumor necrosis factor	ns	*
D_ThroatCarrier	TNF-related apoptosis-inducing ligand	ns	**
D_ThroatCarrier	Tumor necrosis factor	ns	*
D_ThroatCarrier	Urokinase-type plasminogen activator	ns	*

Table 37: *Biomarkers that are statistically significant for either men or women (2 of 8)*

Variable	Biomarker	Men	Women
DairyFrequency	Axin-1	*	ns
DairyFrequency	Natural killer cell receptor 2B4	*	ns
DairyFrequency	T cell surface glycoprotein CD6 isoform	**	ns
DairyFrequency	Protein S100-A12	*	ns
DairyFrequency	Fibroblast growth factor 23	**	ns
DairyFrequency	Interferon gamma	*	ns
DairyFrequency	Interleukin-13	*	ns
DairyFrequency	Interleukin-18 receptor 1	**	ns
DairyFrequency	Interleukin-20	*	ns
DairyFrequency	Interleukin-20 receptor subunit alpha	***	ns
DairyFrequency	Matrix metalloproteinase-1	*	ns
DairyFrequency	Tumor necrosis factor	*	ns
DairyFrequency	Adenosine Deaminase	ns	*
DairyFrequency	Beta-nerve growth factor	ns	*
DairyFrequency	Fractalkine	ns	*
DairyFrequency	Interleukin-10 receptor subunit beta	ns	*
DairyFrequency	Leukemia inhibitory factor receptor	ns	*
DairyFrequency	Programmed cell death 1 ligand 1	ns	*
DairyFrequency	Stem cell factor	ns	*
E_NasalCarrier	Adenosine Deaminase	*	ns
E_NasalCarrier	C-C motif chemokine 20	*	ns
E_NasalCarrier	CUB domain-containing protein 1	*	ns
E_NasalCarrier	Macrophage colony-stimulating factor 1	*	ns
E_NasalCarrier	Interleukin-10 receptor subunit beta	**	ns
E_NasalCarrier	Interleukin-5	*	ns
E_NasalCarrier	Monocyte chemotactic protein 1	*	ns
E_NasalCarrier	Tumor necrosis factor receptor superfamily member 9	**	ns
E_NasalCarrier	Monocyte chemotactic protein 4	ns	*
E_ThroatCarrier	Artemin	**	ns
E_ThroatCarrier	C-C motif chemokine 20	**	ns
E_ThroatCarrier	C-C motif chemokine 4	ns	*
E_ThroatCarrier	Natural killer cell receptor 2B4	ns	*
E_ThroatCarrier	Fractalkine	ns	*
E_ThroatCarrier	Interleukin-13	ns	*
E_ThroatCarrier	Interleukin-17A	ns	*
E_ThroatCarrier	Interleukin-1 alpha	ns	*
E_ThroatCarrier	Interleukin-33	ns	*
E_ThroatCarrier	Interleukin-7	ns	*
E_ThroatCarrier	Latency-associated peptide transforming growth factor beta-1	ns	*
E_ThroatCarrier	TNF-beta	ns	*

Table 38: *Biomarkers that are statistically significant for either men or women (3 of 8)*

Variable	Biomarker	Men	Women
FatFishFrequency	C-C motif chemokine 20	**	*
FatFishFrequency	C-C motif chemokine 23	**	ns
FatFishFrequency	C-C motif chemokine 4	*	ns
FatFishFrequency	CD40L receptor	*	ns
FatFishFrequency	Fractalkine	**	*
FatFishFrequency	Hepatocyte growth factor	**	ns
FatFishFrequency	Interferon gamma	*	ns
FatFishFrequency	Interleukin-10 receptor subunit beta	**	ns
FatFishFrequency	Leukemia inhibitory factor receptor	*	ns
FatFishFrequency	Monocyte chemotactic protein 4	*	ns
FatFishFrequency	Osteoprotegerin	*	ns
FatFishFrequency	Stem cell factor	****	ns
FatFishFrequency	Latency-associated peptide transforming growth factor beta-1	*	ns
FatFishFrequency	Tumor necrosis factor	**	ns
FatFishFrequency	Caspase-8	ns	*
FatFishFrequency	Interleukin-20	ns	*
FatFishFrequency	TNF-beta	ns	*
FatFishFrequency	Tumor necrosis factor ligand superfamily member 14	ns	*
FruitJuiceFrequency	Beta-nerve growth factor	**	ns
FruitJuiceFrequency	Eotaxin	ns	*
FruitJuiceFrequency	C-C motif chemokine 3	ns	*
FruitJuiceFrequency	C-C motif chemokine 4	ns	*
FruitJuiceFrequency	T cell surface glycoprotein CD6 isoform	ns	*
FruitJuiceFrequency	Leukemia inhibitory factor receptor	ns	*
FruitJuiceFrequency	Neurotrophin-3	ns	****
FruitJuiceFrequency	Stem cell factor	ns	**
FruitJuiceFrequency	Urokinase-type plasminogen activator	ns	*
FruitsFrequency	C-C motif chemokine 3	**	ns
FruitsFrequency	Natural killer cell receptor 2B4	**	ns
FruitsFrequency	Interleukin-13	***	*
FruitsFrequency	Osteoprotegerin	*	ns
FruitsFrequency	C-C motif chemokine 20	ns	*
FruitsFrequency	T-cell surface glycoprotein CD5	ns	*
FruitsFrequency	Interleukin-10 receptor subunit alpha	ns	*
FruitsFrequency	Interleukin-15 receptor subunit alpha	ns	*
FruitsFrequency	Interleukin-24	ns	*
FruitsFrequency	Interleukin-2 receptor subunit beta	ns	*
FruitsFrequency	Monocyte chemotactic protein 2	ns	*
FruitsFrequency	Programmed cell death 1 ligand 1	ns	*
FruitsFrequency	TNF-beta	ns	*
GeneralHealth	Brain-derived neurotrophic factor	**	ns
GeneralHealth	Caspase-8	*	ns
GeneralHealth	Interleukin-10 receptor subunit alpha	*	ns
GeneralHealth	Interleukin-17C	*	ns
GeneralHealth	Leukemia inhibitory factor	***	ns
GeneralHealth	Monocyte chemotactic protein 2	*	ns
GeneralHealth	Osteoprotegerin	*	ns
GeneralHealth	Vascular endothelial growth factor A	*	ns
GeneralHealth	Axin-1	ns	*
GeneralHealth	Delta and Notch-like epidermal growth factor-related receptor	ns	**
GeneralHealth	Eukaryotic translation initiation factor 4E-binding protein 1	ns	*
GeneralHealth	Interleukin-5	ns	*
GeneralHealth	Matrix metalloproteinase-1	ns	**
GeneralHealth	SIR2-like protein 2	ns	*
GeneralHealth	STAM-binding protein	ns	*
GeneralHealth	Urokinase-type plasminogen activator	ns	*

Table 39: *Biomarkers that are statistically significant for either men or women (4 of 8)*

Variable	Biomarker	Men	Women
HighSchool	Adenosine Deaminase	**	ns
HighSchool	C-C motif chemokine 25	*	*
HighSchool	Cystatin D	*	ns
HighSchool	Fractalkine	***	*
HighSchool	C-X-C motif chemokine 10	***	ns
HighSchool	Delta and Notch-like epidermal growth factor-related receptor	****	ns
HighSchool	Eukaryotic translation initiation factor 4E-binding protein 1	*	ns
HighSchool	Fibroblast growth factor 21	****	****
HighSchool	Fibroblast growth factor 23	****	ns
HighSchool	Fms-related tyrosine kinase 3 ligand	*	ns
HighSchool	Interleukin-12 subunit beta	*	ns
HighSchool	Interleukin-15 receptor subunit alpha	*	ns
HighSchool	Interleukin-18	*	ns
HighSchool	Interleukin-18 receptor 1	*	**
HighSchool	Interleukin-2	***	*
HighSchool	Interleukin-7	*	ns
HighSchool	Leukemia inhibitory factor	*	ns
HighSchool	Leukemia inhibitory factor receptor	***	*
HighSchool	Monocyte chemotactic protein 1	*	***
HighSchool	Osteoprotegerin	****	ns
HighSchool	Programmed cell death 1 ligand 1	*	ns
HighSchool	Tumor necrosis factor receptor superfamily member 9	*	*
HighSchool	Tumor necrosis factor ligand superfamily member 14	***	ns
HighSchool	TNF-related activation-induced cytokine	*	ns
HighSchool	Urokinase-type plasminogen activator	***	**
HighSchool	C-C motif chemokine 20	ns	*
HighSchool	C-C motif chemokine 4	ns	**
HighSchool	Fibroblast growth factor 19	ns	**
HighSchool	Interleukin-20	ns	*
HighSchool	Interleukin-6	ns	**
HighSchool	Monocyte chemotactic protein 4	ns	*
HighSchool	Matrix metalloproteinase-1	ns	*
HighSchool	Stem cell factor	ns	**
HighSchool	Transforming growth factor alpha	ns	*
HighSchool	Thymic stromal lymphopoietin	ns	*
LeanFishFrequency	CD40L receptor	*	ns
LeanFishFrequency	Eukaryotic translation initiation factor 4E-binding protein 1	*	ns
LeanFishFrequency	Fibroblast growth factor 23	*	ns
LeanFishFrequency	Interleukin-4	*	ns
LeanFishFrequency	Interleukin-6	*	ns
LeanFishFrequency	SIR2-like protein 2	*	ns
LeanFishFrequency	Urokinase-type plasminogen activator	**	ns
LeanFishFrequency	Vascular endothelial growth factor A	*	ns
LeanFishFrequency	C-C motif chemokine 28	ns	*
LeanFishFrequency	C-X-C motif chemokine 11	ns	**
LeanFishFrequency	Fibroblast growth factor 21	ns	**
LeanFishFrequency	Interleukin-18	ns	*
LeanFishFrequency	Matrix metalloproteinase-10	ns	*

Table 40: *Biomarkers that are statistically significant for either men or women (5 of 8)*

Variable	Biomarker	Men	Women
ScreenTime	Fibroblast growth factor 19	*	ns
ScreenTime	CUB domain-containing protein 1	ns	*
ScreenTime	Interleukin-1 alpha	ns	**
ScreenTime	Leukemia inhibitory factor receptor	ns	*
ScreenTime	Transforming growth factor alpha	ns	*
ScreenTime	Tumor necrosis factor ligand superfamily member 14	ns	*
Smoke	Fibroblast growth factor 23	*	ns
Smoke	Interleukin-12 subunit beta	*	ns
Smoke	Interleukin-1 alpha	**	ns
Smoke	Interleukin-7	*	*
Smoke	Matrix metalloproteinase-10	***	ns
Smoke	Tumor necrosis factor	**	*
Smoke	Adenosine Deaminase	ns	**
Smoke	Eotaxin	ns	*
Smoke	CUB domain-containing protein 1	ns	*
Smoke	Cystatin D	ns	*
Smoke	C-X-C motif chemokine 9	ns	**
Smoke	Delta and Notch-like epidermal growth factor-related receptor	ns	***
Smoke	Fibroblast growth factor 21	ns	****
Smoke	Glial cell line-derived neurotrophic factor	ns	*
Smoke	Interleukin-18 receptor 1	ns	*
Smoke	Leukemia inhibitory factor receptor	ns	****
Smoke	Stem cell factor	ns	****
Smoke	Urokinase-type plasminogen activator	ns	****
Snuff	Adenosine Deaminase	**	ns
Snuff	Cystatin D	**	ns
Snuff	Fractalkine	***	ns
Snuff	Fibroblast growth factor 21	**	**
Snuff	Fibroblast growth factor 23	*	ns
Snuff	Interleukin-17C	*	ns
Snuff	Interleukin-1 alpha	**	ns
Snuff	Interleukin-22 receptor subunit alpha-1	*	ns
Snuff	Oncostatin-M	*	ns
Snuff	Stem cell factor	**	***
Snuff	Tumor necrosis factor	*	ns
Snuff	Tumor necrosis factor ligand superfamily member 14	*	ns
Snuff	CD40L receptor	ns	**
Snuff	Macrophage colony-stimulating factor 1	ns	**
Snuff	C-X-C motif chemokine 9	ns	*
Snuff	Glial cell line-derived neurotrophic factor	ns	***
Snuff	Interleukin-18 receptor 1	ns	**
Snuff	Leukemia inhibitory factor receptor	ns	*
Snuff	Urokinase-type plasminogen activator	ns	***
Snuff	Vascular endothelial growth factor A	ns	*

Table 41: *Biomarkers that are statistically significant for either men or women (6 of 8)*

Variable	Biomarker	Men	Women
SportsLeisure	Adenosine Deaminase	**	***
SportsLeisure	C-C motif chemokine 19	**	ns
SportsLeisure	C-C motif chemokine 4	*	ns
SportsLeisure	Delta and Notch-like epidermal growth factor-related receptor	**	*
SportsLeisure	Fibroblast growth factor 21	****	****
SportsLeisure	Fibroblast growth factor 23	*	ns
SportsLeisure	Leukemia inhibitory factor receptor	*	ns
SportsLeisure	Urokinase-type plasminogen activator	***	**
SportsLeisure	Vascular endothelial growth factor A	*	ns
SportsLeisure	C-C motif chemokine 23	ns	*
SportsLeisure	C-X-C motif chemokine 1	ns	*
SportsLeisure	Interleukin-6	ns	***
SugarDrinkFrequency	Eukaryotic translation initiation factor 4E-binding protein 1	**	ns
SugarDrinkFrequency	Interleukin-10 receptor subunit alpha	*	ns
SugarDrinkFrequency	C-C motif chemokine 3	ns	*
SugarDrinkFrequency	Fractalkine	ns	*
SugarDrinkFrequency	Interleukin-12 subunit beta	ns	*
SugarDrinkFrequency	Monocyte chemotactic protein 2	ns	*
SugarDrinkFrequency	Signaling lymphocytic activation molecule	ns	**
SugarDrinkFrequency	TNF-beta	ns	*
SugarDrinkFrequency	Thymic stromal lymphopoietin	ns	**
SugarJuiceFrequency	C-C motif chemokine 25	*	ns
SugarJuiceFrequency	Interleukin-5	*	ns
SugarJuiceFrequency	Neurturin	*	ns
SugarJuiceFrequency	Signaling lymphocytic activation molecule	*	ns
SugarJuiceFrequency	C-C motif chemokine 3	ns	**
SugarJuiceFrequency	T cell surface glycoprotein CD6 isoform	ns	*
SugarJuiceFrequency	Leukemia inhibitory factor receptor	ns	*
SummerTransport	C-C motif chemokine 19	*	ns
SummerTransport	C-C motif chemokine 28	**	ns
SummerTransport	Eukaryotic translation initiation factor 4E-binding protein 1	*	*
SummerTransport	Interleukin-24	*	ns
SummerTransport	Interleukin-33	*	**
SummerTransport	Interleukin-4	****	ns
SummerTransport	Monocyte chemotactic protein 1	*	ns
SummerTransport	Axin-1	ns	*
SummerTransport	Caspase-8	ns	**
SummerTransport	C-C motif chemokine 3	ns	*
SummerTransport	CUB domain-containing protein 1	ns	*
SummerTransport	C-X-C motif chemokine 11	ns	*
SummerTransport	Fibroblast growth factor 19	ns	*
SummerTransport	Hepatocyte growth factor	ns	*
SummerTransport	Interleukin-18	ns	**
SummerTransport	Interleukin-18 receptor 1	ns	*
SummerTransport	Interleukin-2	ns	*
SummerTransport	Matrix metalloproteinase-1	ns	*

Table 42: *Biomarkers that are statistically significant for either men or women (7 of 8)*

Variable	Biomarker	Men	Women
SweetenerDrinkFrequency	Fractalkine	*	ns
SweetenerDrinkFrequency	Urokinase-type plasminogen activator	*	ns
SweetenerDrinkFrequency	Caspase-8	ns	*
SweetenerDrinkFrequency	Interleukin-13	ns	*
SweetenerDrinkFrequency	Interleukin-22 receptor subunit alpha-1	ns	*
SweetenerDrinkFrequency	Monocyte chemotactic protein 2	ns	*
SweetenerDrinkFrequency	Monocyte chemotactic protein 3	ns	*
SweetenerDrinkFrequency	Neurotrophin-3	ns	****
SweetenerDrinkFrequency	Stem cell factor	ns	*
SweetenerDrinkFrequency	Tumor necrosis factor	ns	*
SweetenerDrinkFrequency	Thymic stromal lymphopoietin	ns	*
VegetablesFrequency	Caspase-8	*	ns
VegetablesFrequency	C-C motif chemokine 4	*	ns
VegetablesFrequency	Interleukin-4	**	ns
VegetablesFrequency	Interleukin-7	*	ns
VegetablesFrequency	Stem cell factor	**	ns
VegetablesFrequency	Tumor necrosis factor	*	ns
VegetablesFrequency	Eotaxin	ns	*
VegetablesFrequency	C-C motif chemokine 19	ns	*
VegetablesFrequency	Fractalkine	ns	*
WaterFrequency	Interleukin-4	**	ns
WaterFrequency	Monocyte chemotactic protein 2	*	ns
WaterFrequency	Urokinase-type plasminogen activator	*	ns
WaterFrequency	Brain-derived neurotrophic factor	ns	*
WaterFrequency	Fibroblast growth factor 5	ns	*
WaterFrequency	Interleukin-2 receptor subunit beta	ns	*
WinterTransport	C-C motif chemokine 19	**	ns
WinterTransport	Eukaryotic translation initiation factor 4E-binding protein 1	*	ns
WinterTransport	Fms-related tyrosine kinase 3 ligand	*	ns
WinterTransport	Interleukin-24	*	ns
WinterTransport	Interleukin-4	*	ns
WinterTransport	Monocyte chemotactic protein 2	*	ns
WinterTransport	TNF-beta	*	ns
WinterTransport	Tumor necrosis factor receptor superfamily member 9	*	ns
WinterTransport	Caspase-8	ns	*
WinterTransport	Fibroblast growth factor 19	ns	*
WinterTransport	Fibroblast growth factor 5	ns	*
WinterTransport	Hepatocyte growth factor	ns	**
WinterTransport	Interleukin-22 receptor subunit alpha-1	ns	*
WinterTransport	Matrix metalloproteinase-1	ns	*
WinterTransport	Matrix metalloproteinase-10	ns	*
WinterTransport	Transforming growth factor alpha	ns	*
WinterTransport	Latency-associated peptide transforming growth factor beta-1	ns	**

Table 43: *Biomarkers that are statistically significant for either men or women (8 of 8)*

8 Change History

This section helps keeping track of all the changes done in the document. Here is where all the TODO notes go when they are resolved. And you would find something like this so it is not repeated again

0.1

Something changed for the first time, and here is why it happens

0.2

The change was bad. Somebody suggested that we undo the change and just clarify the second paragraph.

0.22

We decided that dogs should not also be included in the results part, the article will talk only about humans from now on.