



University of
Nottingham

UK | CHINA | MALAYSIA



Health Studies User Conference 2023, London, UCL

**Better Quality of life:
Healthy Human Movement Behaviour might be more
important than healthy BMI and waist circumference.**



UK Data Service

Dr Maryam Kazemi

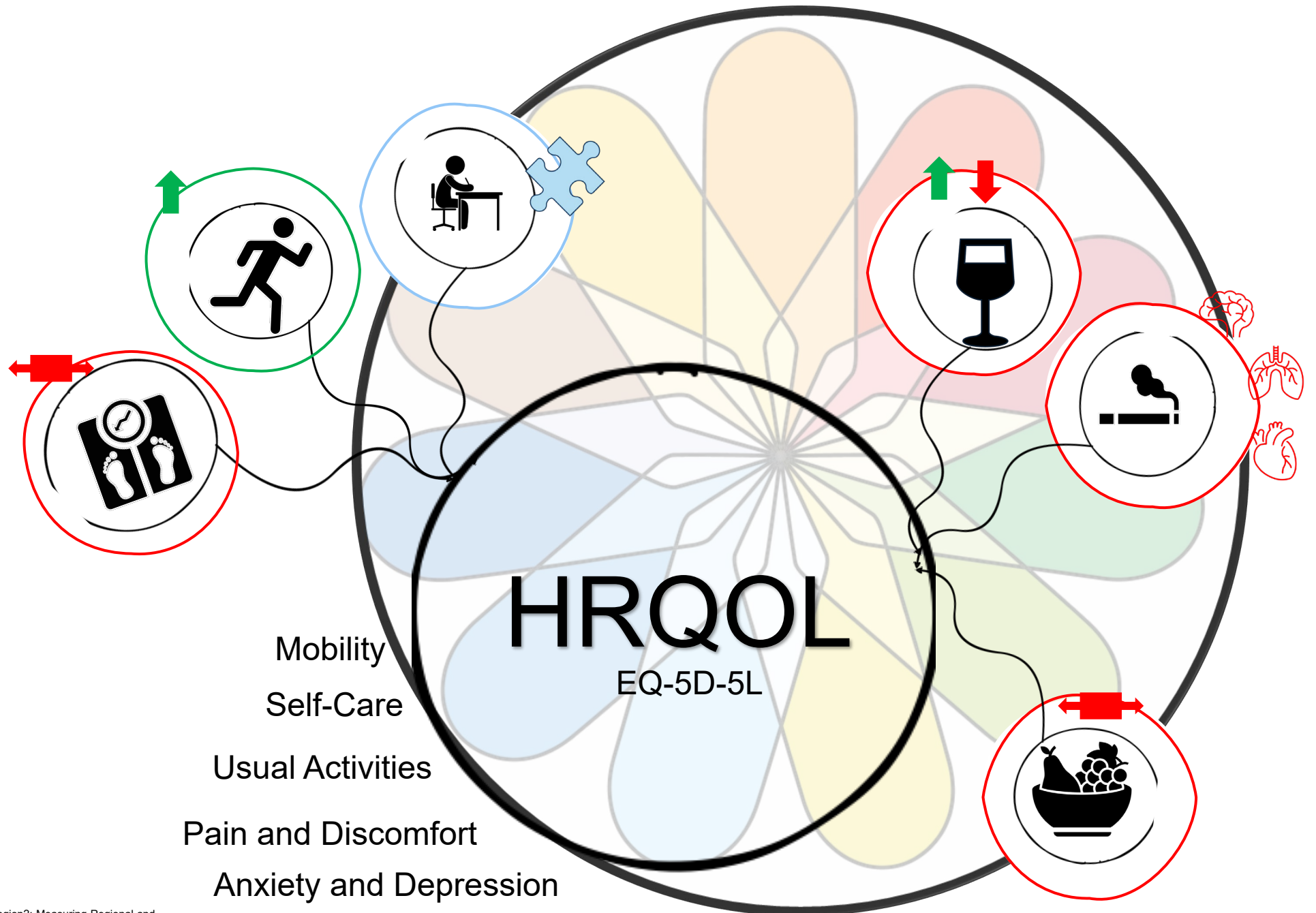
MD, MSc, MMedEd

&

Professor Kimberley Edwards



Background

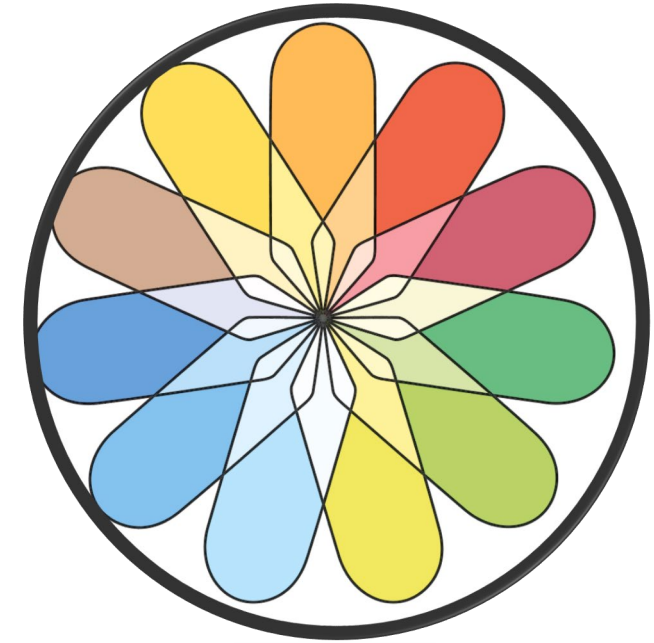


- Mobility
- Self-Care
- Usual Activities
- Pain and Discomfort
- Anxiety and Depression



Aims and Objectives

- 1- Investigating whether HRBs cluster within-population and see if physical activity clusters with any other health-related behaviour.
- 2- Constructing a HRBs focused model
- 3- Examining whether the model can validly predict HRQOL

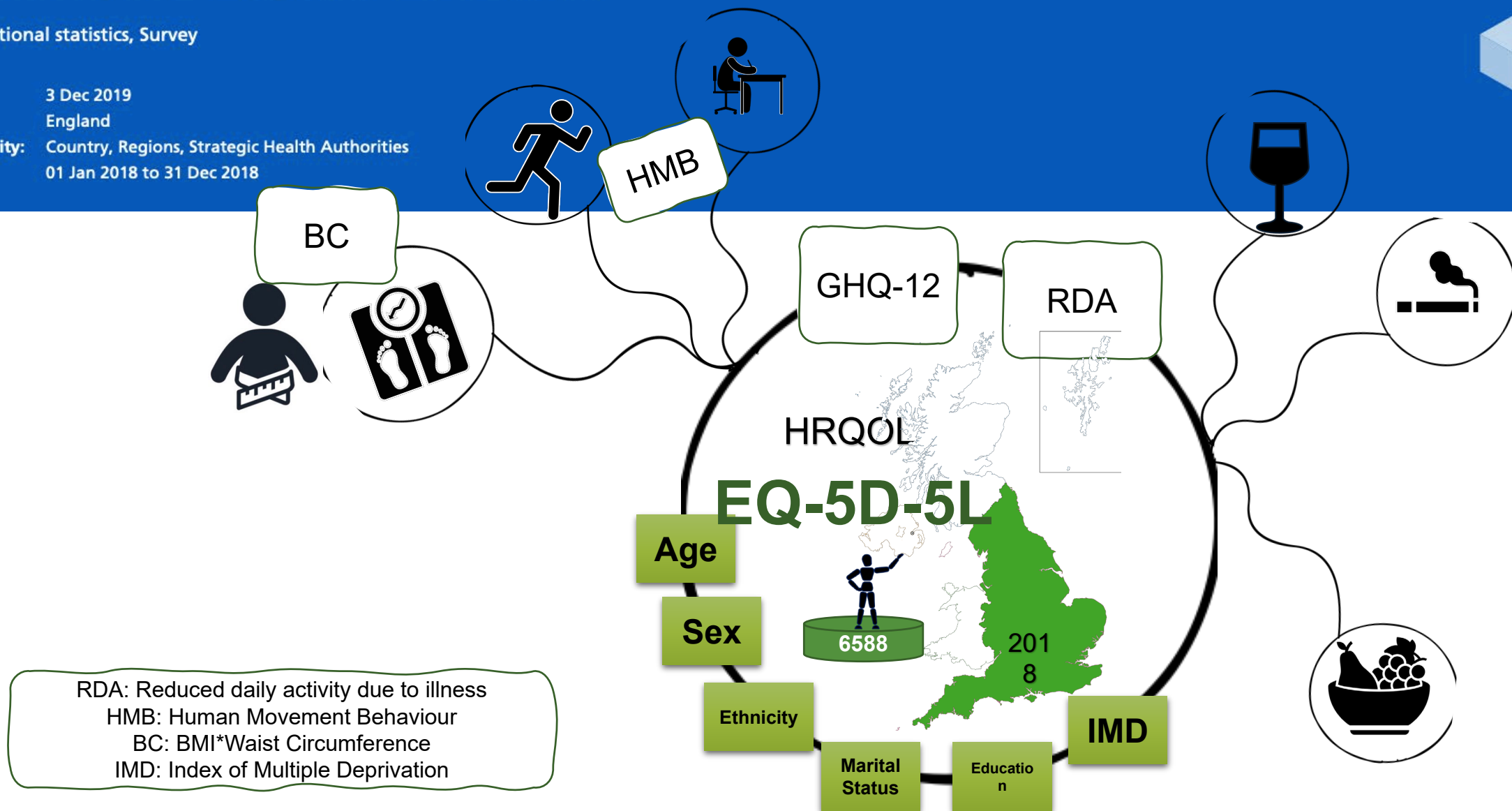


Health Survey for England 2018 [NS]

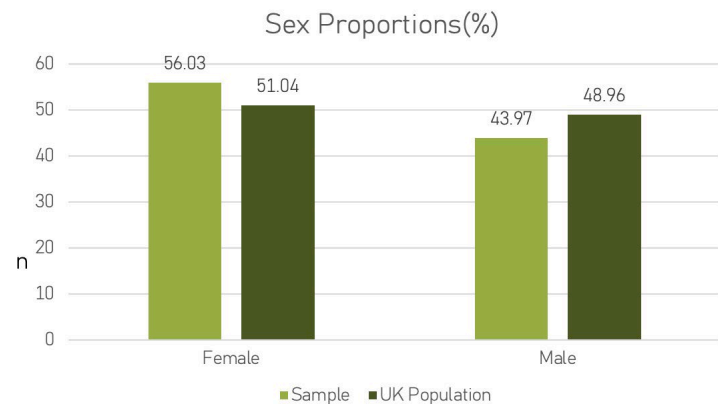
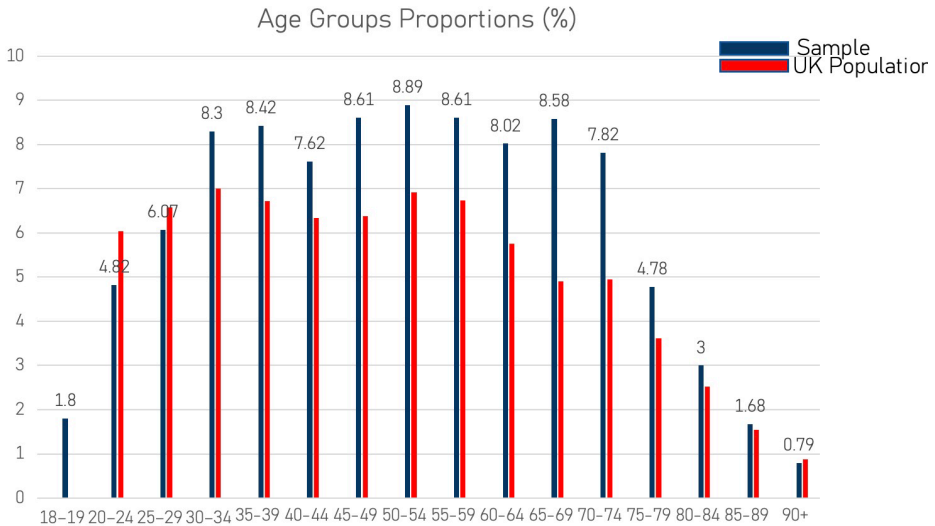
Official statistics, National statistics, Survey

Publication Date: 3 Dec 2019
Geographic Coverage: England
Geographical Granularity: Country, Regions, Strategic Health Authorities
Date Range: 01 Jan 2018 to 31 Dec 2018

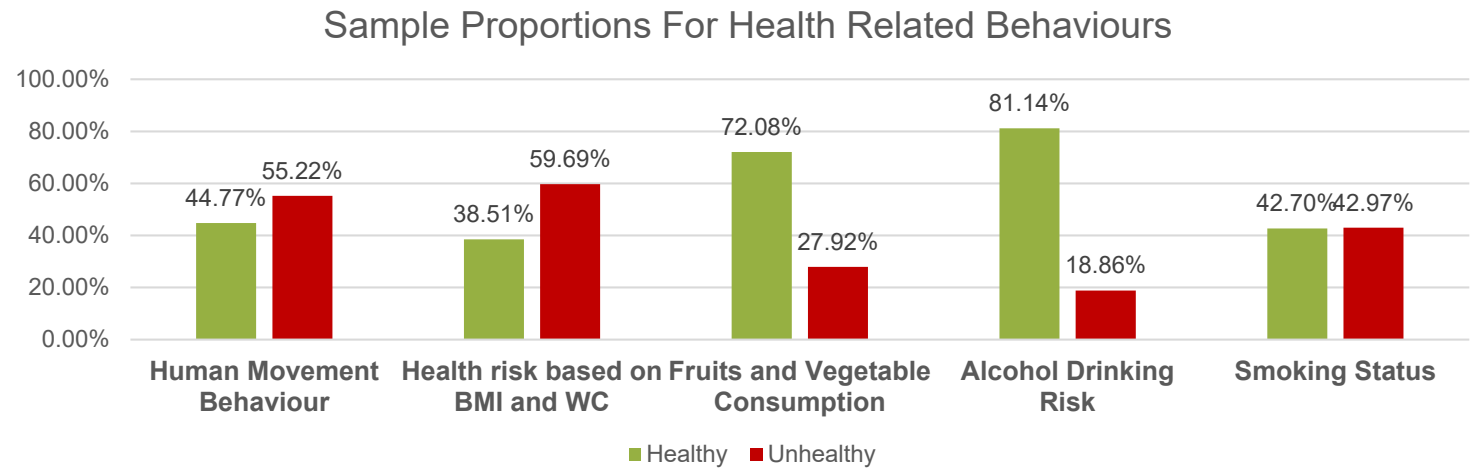
Methods



Participants Characteristics (n=6588)



Results



Variable	Healthy	Unhealthy
BC	No increased Risk	Increased Risk +High Risk very High Risk
HMB	Low Risk	Medium Risk+ High Risk
Smoking	Never Smoked +Ex-Smoker	Current Smoker
AC	Not Drinker+ Low-Risk Drinker	Moderate Risk+ High Risk
FVC	More than five portions	Less than five portions

Results



Ratio of Sizes	HMB	BC	Drinking	Smoking	FVC	Number of clusters
2.48						5
11.65						14
12.1						14
14.73						14
7.67						11
8.03						11
9.23						8
7.4						8
6.1						8
15.08						8
21.79						8
19.7						8
18.81						8
21.72						8
12.84						7
1.89						4
4.95						4
5.1						4
3.33						4
6.92						4
6.22						4
3.91						4
12.82						4
12.67						4
15.38						4

Cluster Analysis

The ratio of sizes:1.89

The maximum number of Clusters to identify was set to 15. The ratio of sizes under 2 was accepTable.

Cluster size

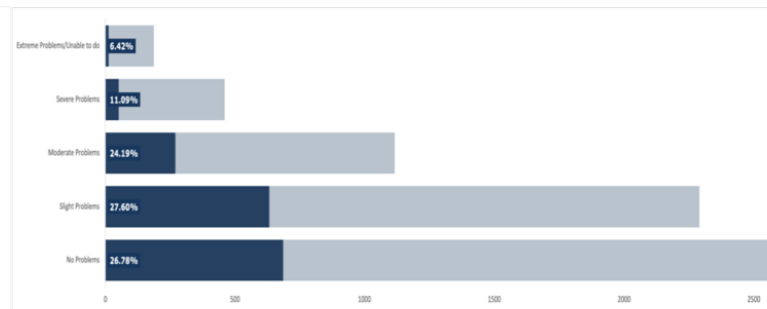
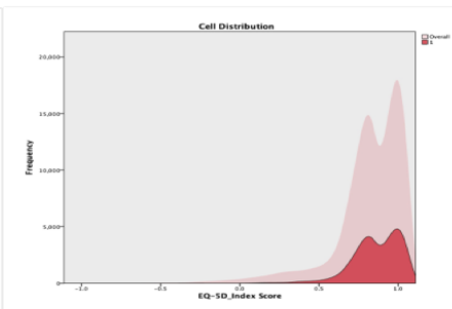
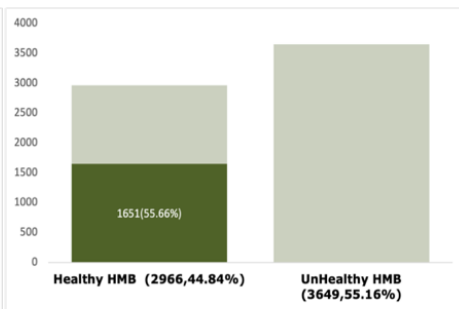
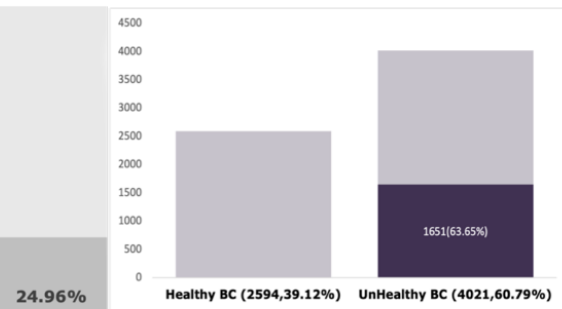
The proportions of the cluster/population with a Healthy and Unhealthy Body shape

The proportion of the cluster/population with a Healthy and Unhealthy HMB

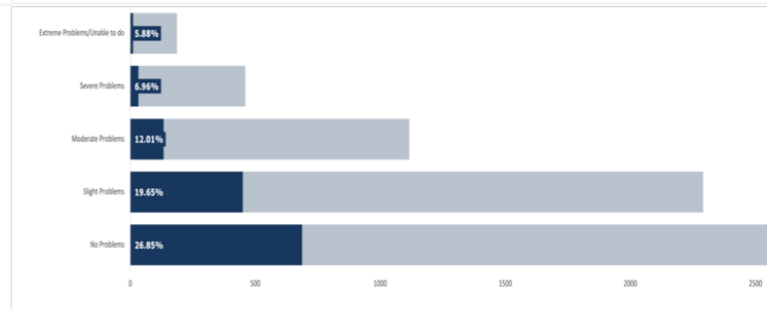
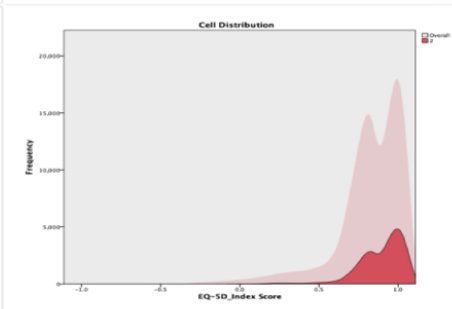
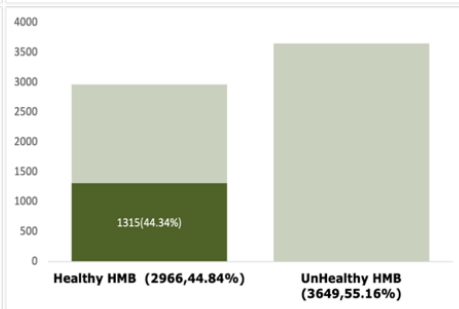
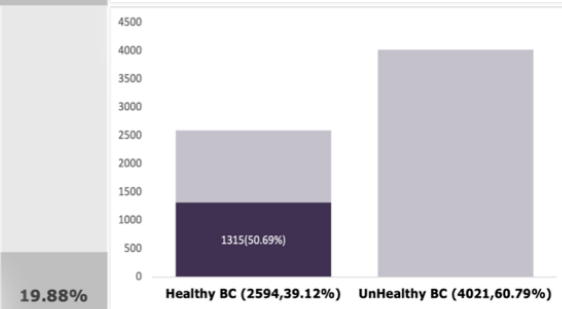
The Distribution of EQ-5D-5L index score in the cluster/population

The proportion of membership in levels of EQ-5D-5L in cluster/population

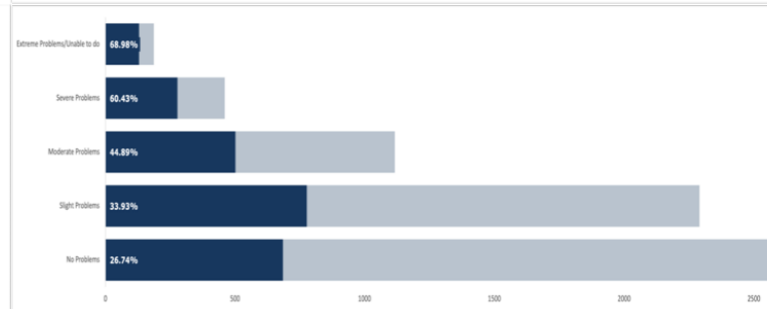
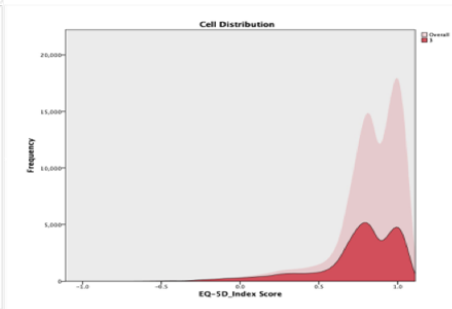
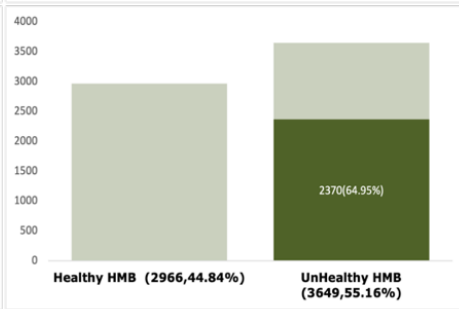
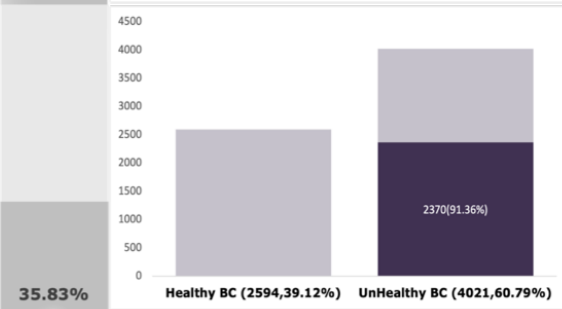
Cluster 1



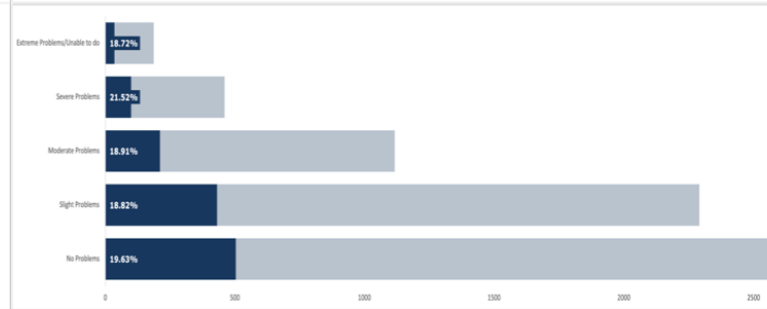
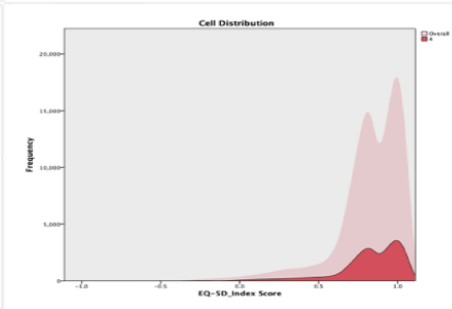
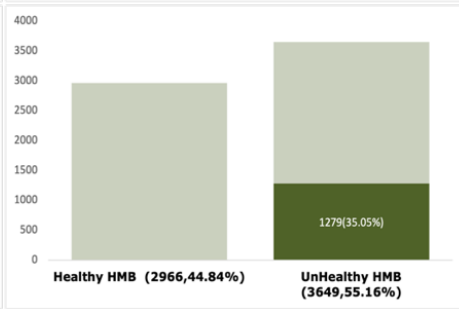
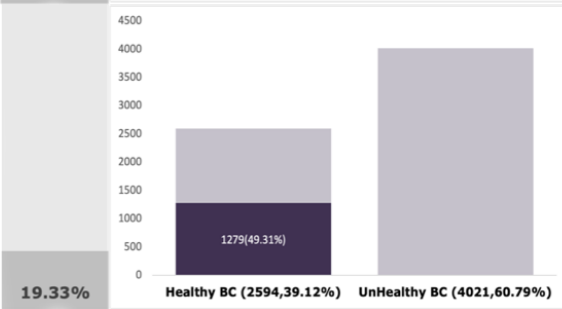
Cluster 2



Cluster 3

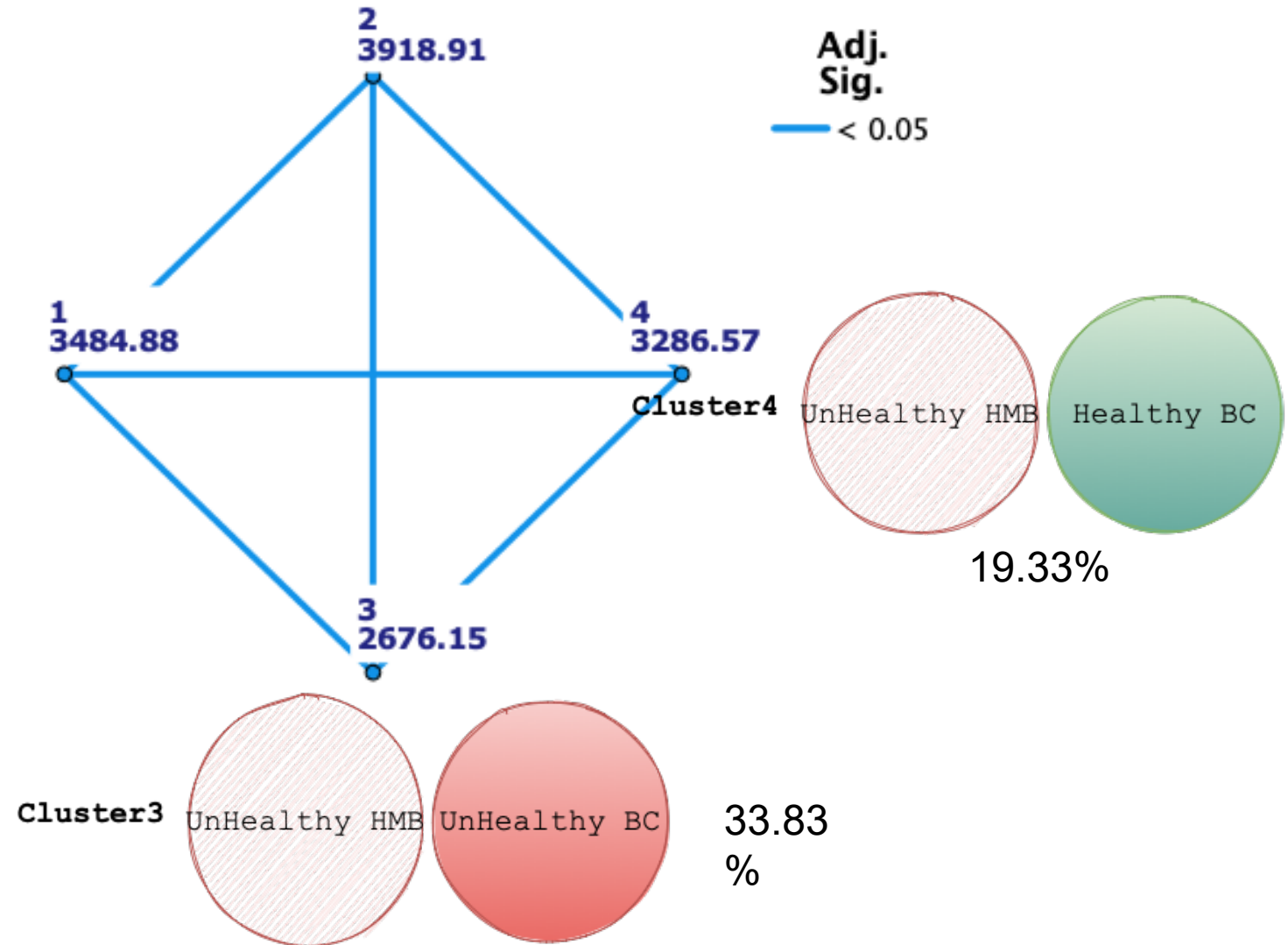
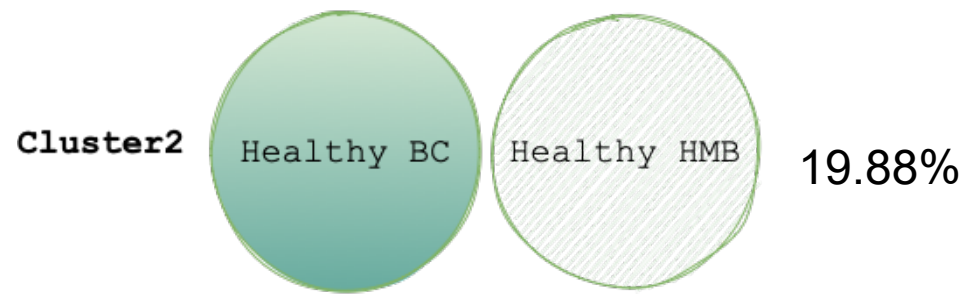
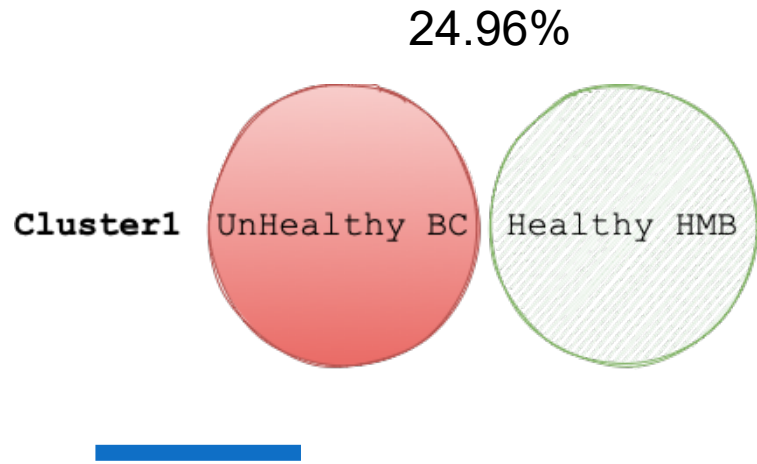


Cluster 4



Comparing Clusters

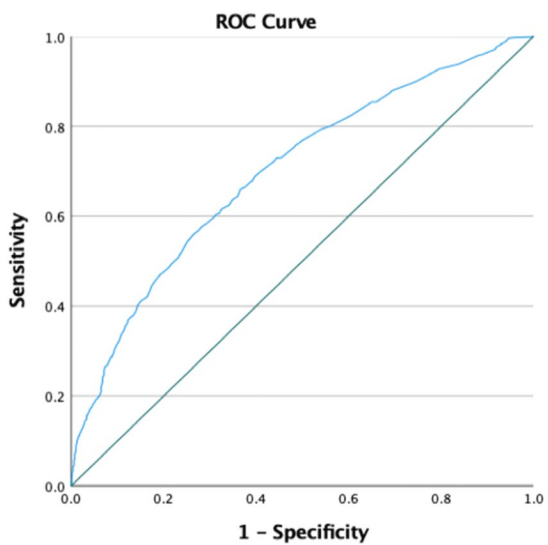
Results



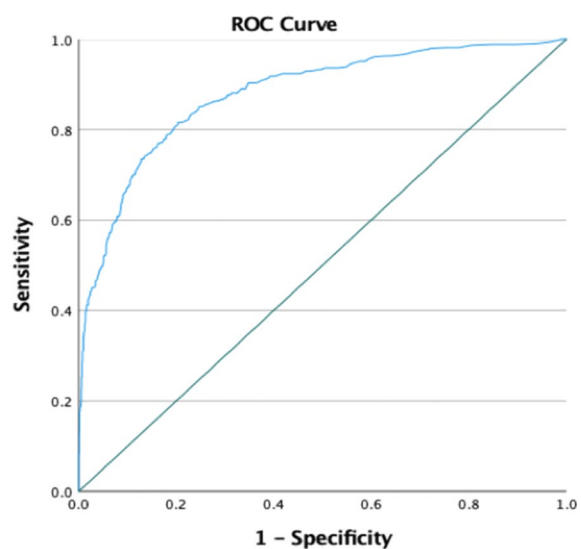
Health Related Behaviours that significantly distinguished People with some degree of problems From people with No problems

Slight Problems	1.37[1.09-1.72]	Very High-Risk BC	
Moderate Problems	1.83[1.29-2.60]	Current smoker/vaper	
	1.60[1.13-2.62]	Medium Risk HMB	
	1.95[1.44-2.65]	Very High-Risk BC	
Severe Problems	0.38[0.22-0.65]	Low-Risk Drinker	
	2.70[1.59-4.61]	Current smoker/vaper	
	2.91[1.79-4.72]	High Risk HMB	
	2.20[1.14-4.24]	Medium Risk HMB	
	1.88[1.16-3.02]	Very High-Risk BC	
Extreme Problems	0.33[0.17-0.65]	Low-Risk Drinker	
	3.38[1.64-6.94]	Current smoker/vaper	
	5.80[2.69-12.54]	High Risk HMB	

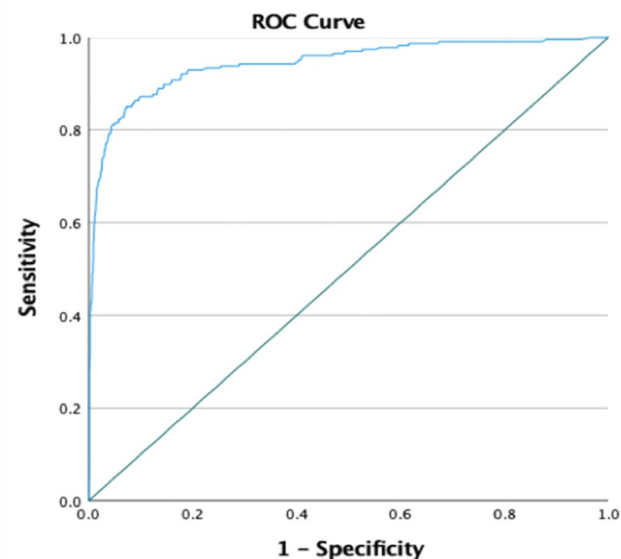
Slight Problems



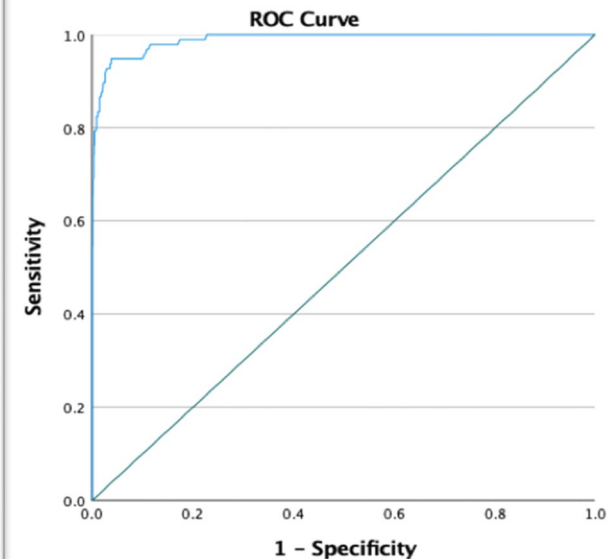
Moderate Problems



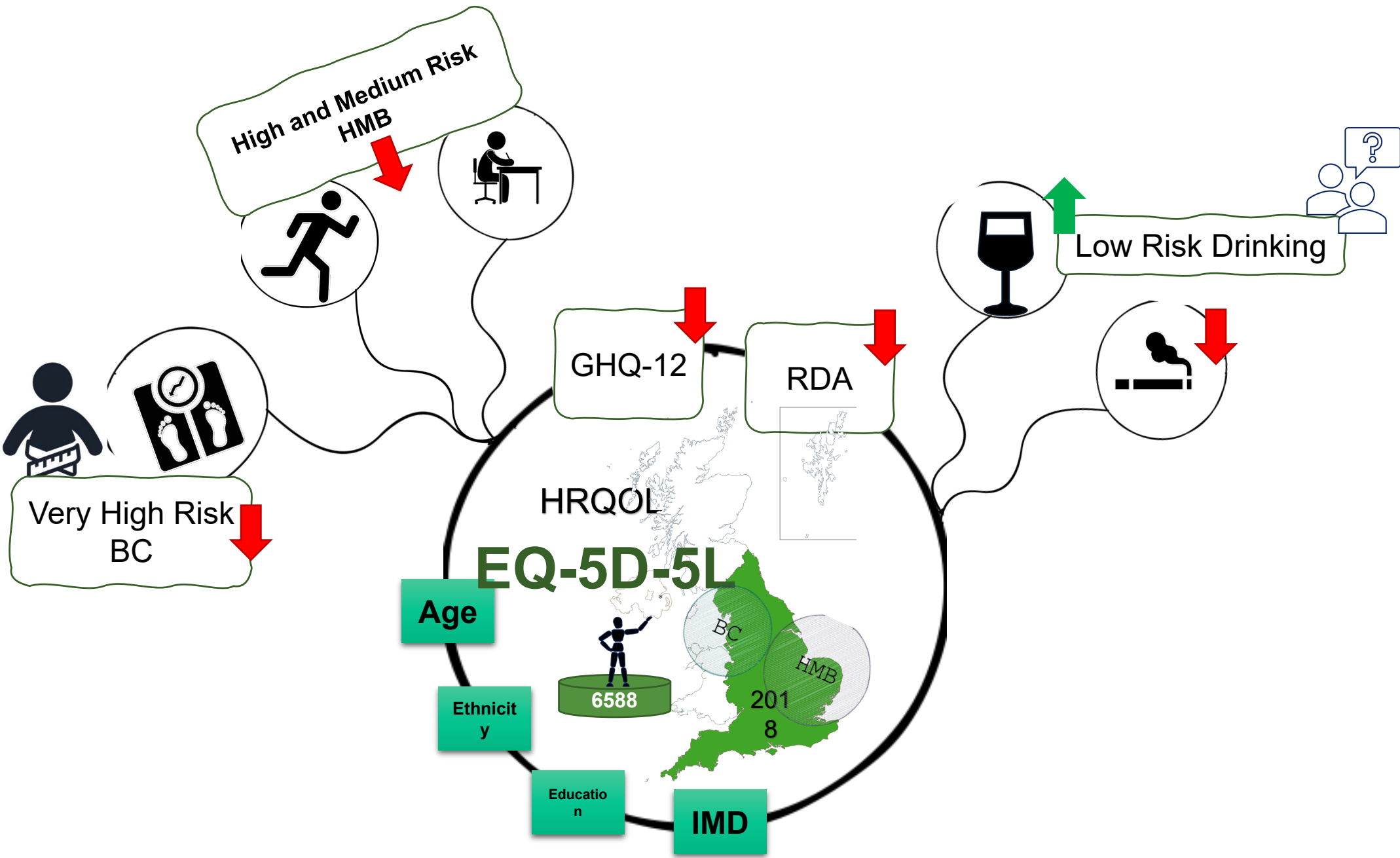
Severe Problems



Extreme Problems



	Slight Problems	Moderate Problems	Severe Problems	Extreme problems
Model Accuracy in Training Data	69.81%	87.91%	95.00%	98.90%
Model Accuracy in Validation Data	63.16%	81.8%	83.4%	94.47%



Discussion

Main Conclusion



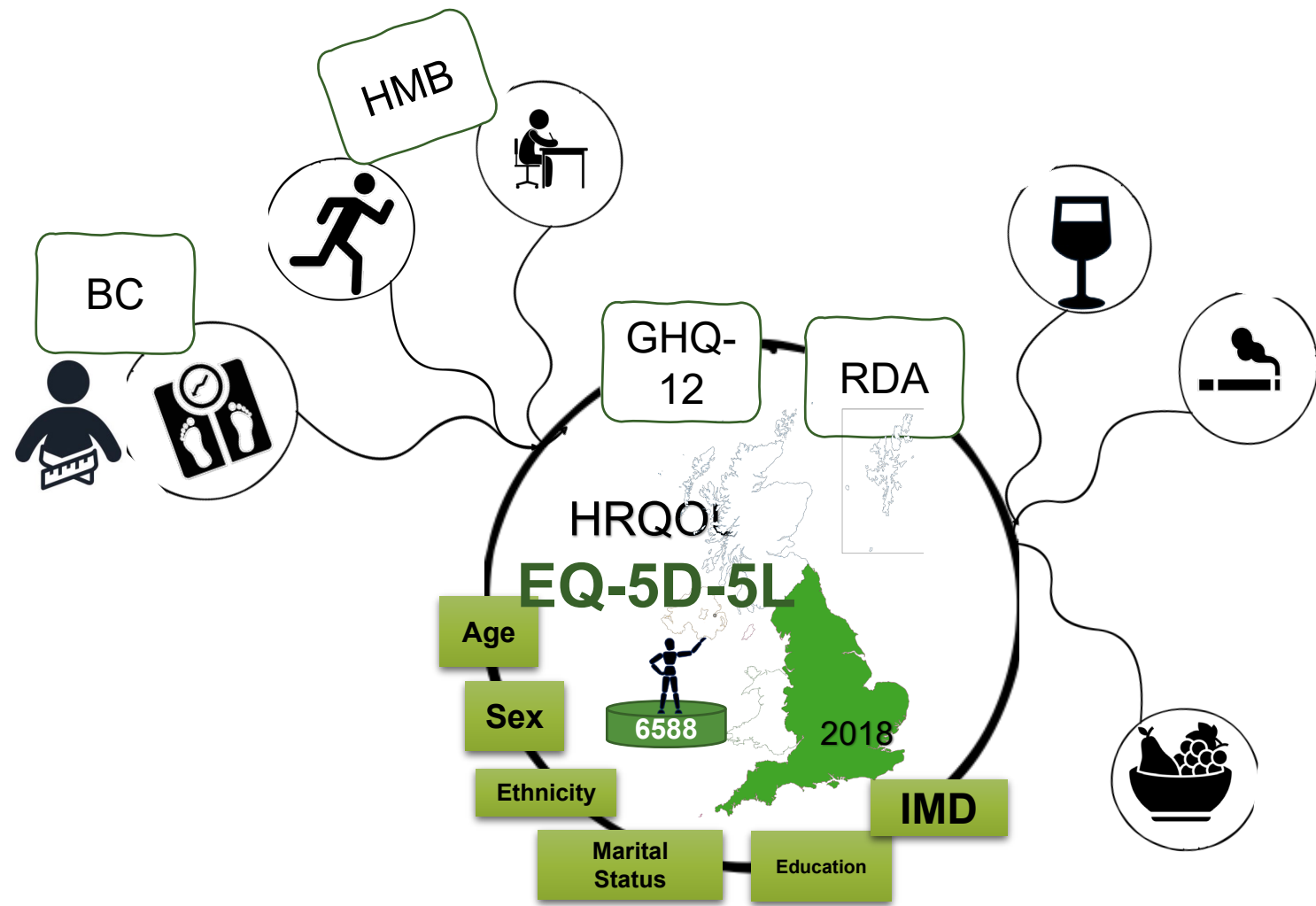
Adults who had **healthy HMB** but **unhealthy BMI and WC** had better Rank in HRQOL scores than adults who had **Unhealthy HMB** but **Healthy HMB**

Strengths

- Nationally representative Sample
- Comprehensive variables
- Valid model
- Emphasis on the HMB rather than just PA
- Controlling for important determinants of HRQOL

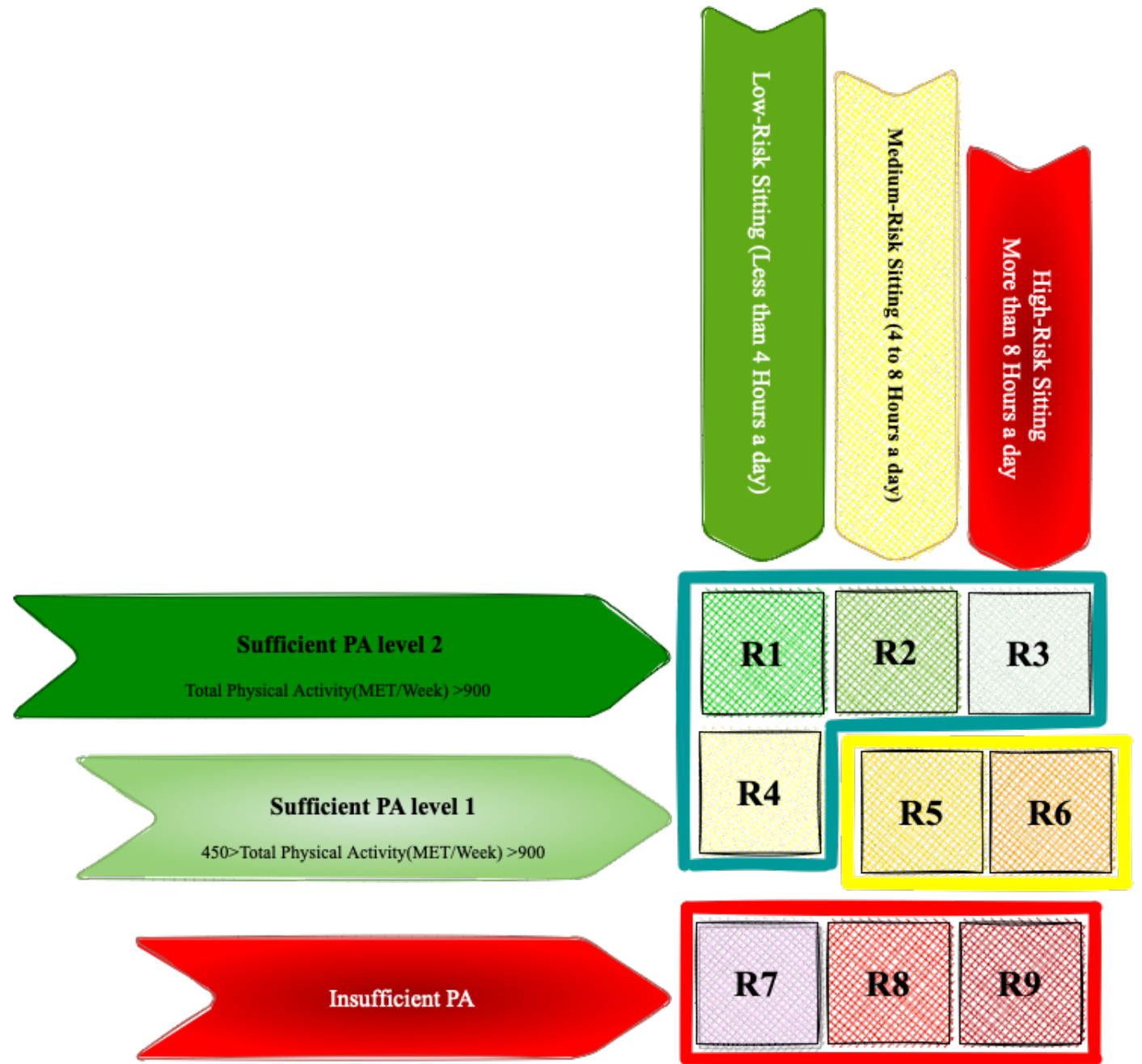
Limitations

- Sleeping Patterns as Health-related behaviour
- Binge Drinking
- No Clinical Utility for the prediction model



Thanks For Attention

HMB



	Low Risk (men <94 cm, women <80 cm)	High Risk (men 94–102 cm, women 80–88 cm)	Very high Risk (men >102 cm, women >88 cm)
Healthy weight (BMI of 18.5-24.9 kg/m ²)	No Increased Risk	No Increased Risk	Increased Risk
Overweight (BMI of 25-29.9 kg/m ²)	No Increased Risk	Increased Risk	High Risk
Obesity I (BMI of 30-34.9 kg/m ²)	Increased Risk	High Risk	Very High Risk
Obesity II (BMI of 35-39.9 kg/m ²)	Very High Risk	Very High Risk	Very High Risk
Obesity III (BMI of 40 kg/m ² or more)	Very High Risk	Very High Risk	Very High Risk

$$\frac{\text{BMI} \times W}{C}$$

RDA

		Number of Longstanding Illnesses		
		One Long Lasting Illness	More than one Long Lasting Illnesses	No Long Lasting Illnesses
Day-to-day activities reduced due to illness	A Lot	One Disease /limited a lot	More than one disease /Limited a lot	
	A Little	One Disease /limited a little	More than One Disease /limited a lot	
	Not Reduced	One Disease /Not Limited	More Than One Disease /Not limited a lot	No Disease/No Limitations

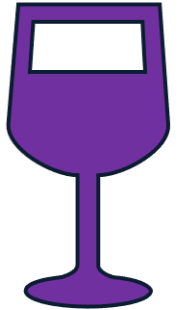
Alcohol Drinking Risk

Not Drinker (Lowest Risk)

Low-Risk Drinker (up to 14Un Women, up to 21U Men)

Medium Risk Drinker (up to 35Un Women, up to 50U Men)

High-Risk Drinker (More than 35Un Women, more than 50U Men)



Predictors ("Slight Problems" from "No Problems")

Odds Ratio[CI95%]

Age (18 and older) (5-Year Band)

Ethnicity (White,ref.)

Black

Asian

Mixed

Education(No Qualification, ref.)

NVQ4/NVQ5/Degree or equiv

Below degree

IMD

RDA

GHQ(Mental Health)

Alcohol Risk (NoDrinker,ref.)

High-Risk Drinker (More than 35Un Women, More than 50U Men)

Medium Risk Drinker (up to 35Un Women, up to 50U Men)

Low-Risk Drinker (up to 14Un Women, up to 21U Men)

Health risk classifications BMI and WC (No Increased Risk,ref.)

Very High Risk

High Risk

Increased Risk

Smoking State(Never Smoker,ref.)

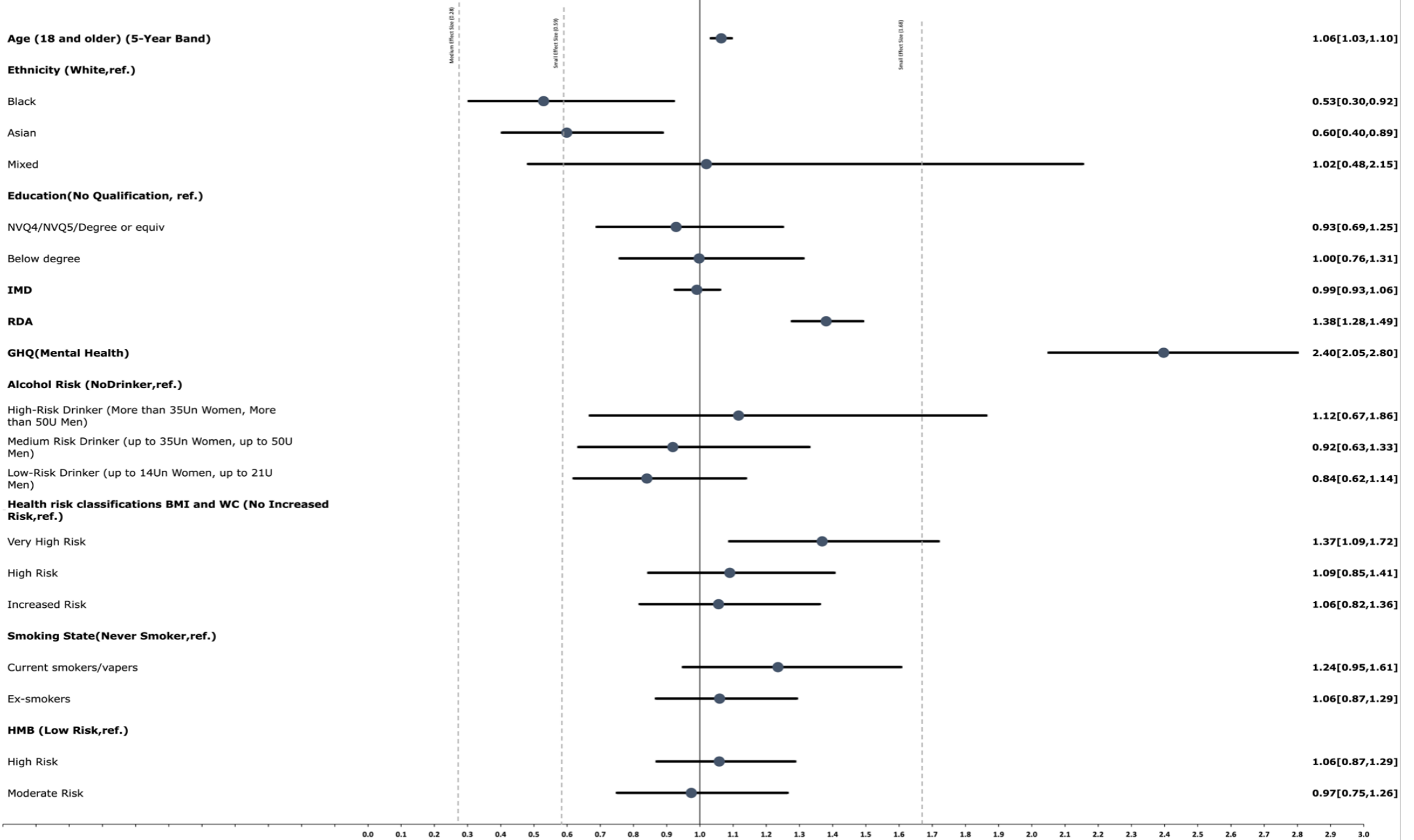
Current smokers/vapers

Ex-smokers

HMB (Low Risk,ref.)

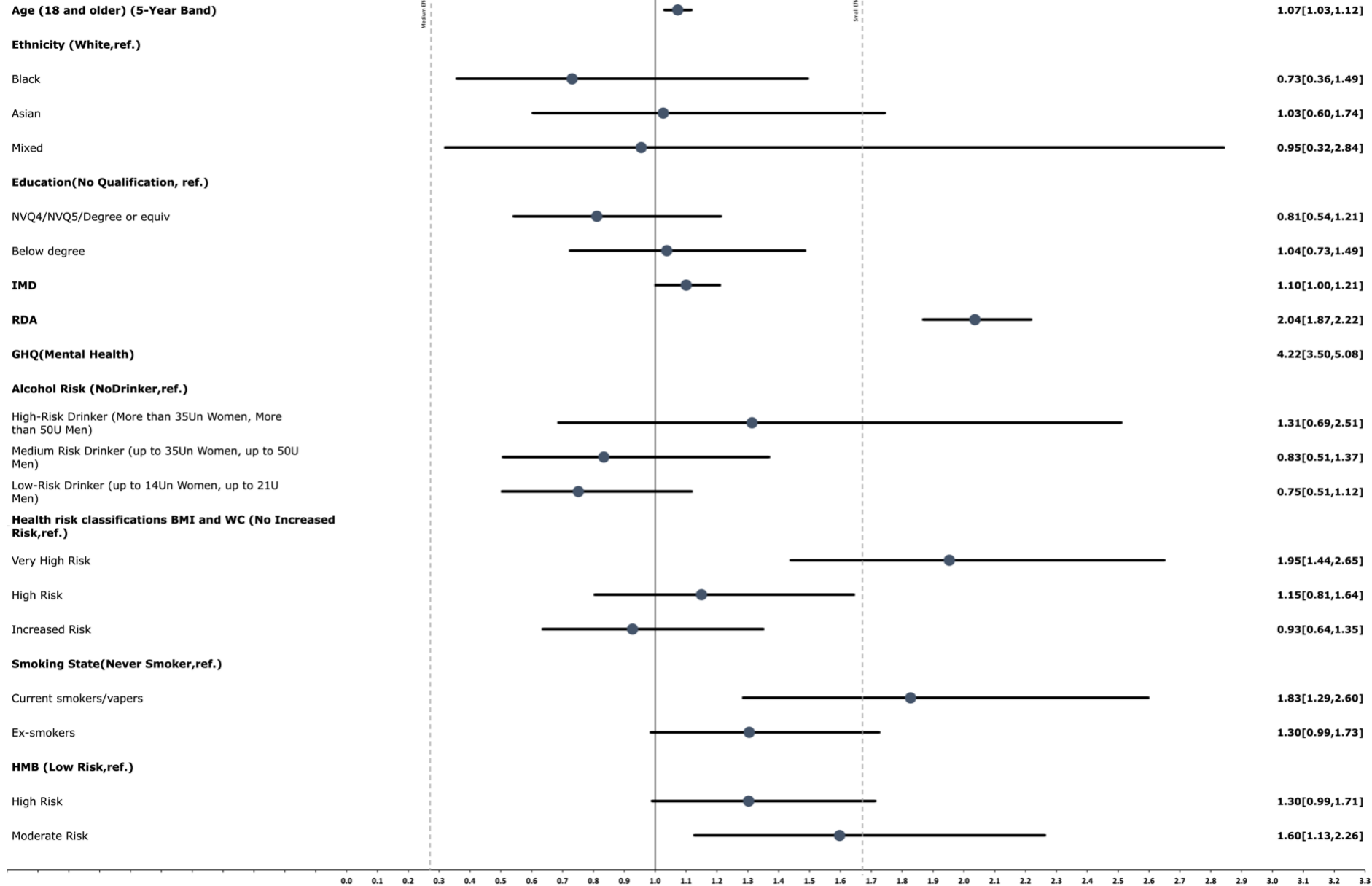
High Risk

Moderate Risk



Predictors ("Moderate Problems" from "No Problems")

Odds Ratio[CI95%]



Predictors ("Severe Problems" from "No Problems")

Odds Ratio [CI95%]

Age (18 and older) (5-Year Band)

Ethnicity (White,ref.)

Black

Asian

Mixed

Education (No Qualification, ref.)

NVQ4/NVQ5/Degree or equiv

Below degree

IMD

RDA

GHQ (Mental Health)

Alcohol Risk (No Drinker, ref.)

High-Risk Drinker (More than 35 Un Women, More than 50 Un Men)

Medium Risk Drinker (up to 35 Un Women, up to 50 Un Men)

Low-Risk Drinker (up to 14 Un Women, up to 21 Un Men)

Health risk classifications BMI and WC (No Increased Risk, ref.)

Very High Risk

High Risk

Increased Risk

Smoking State (Never Smoker, ref.)

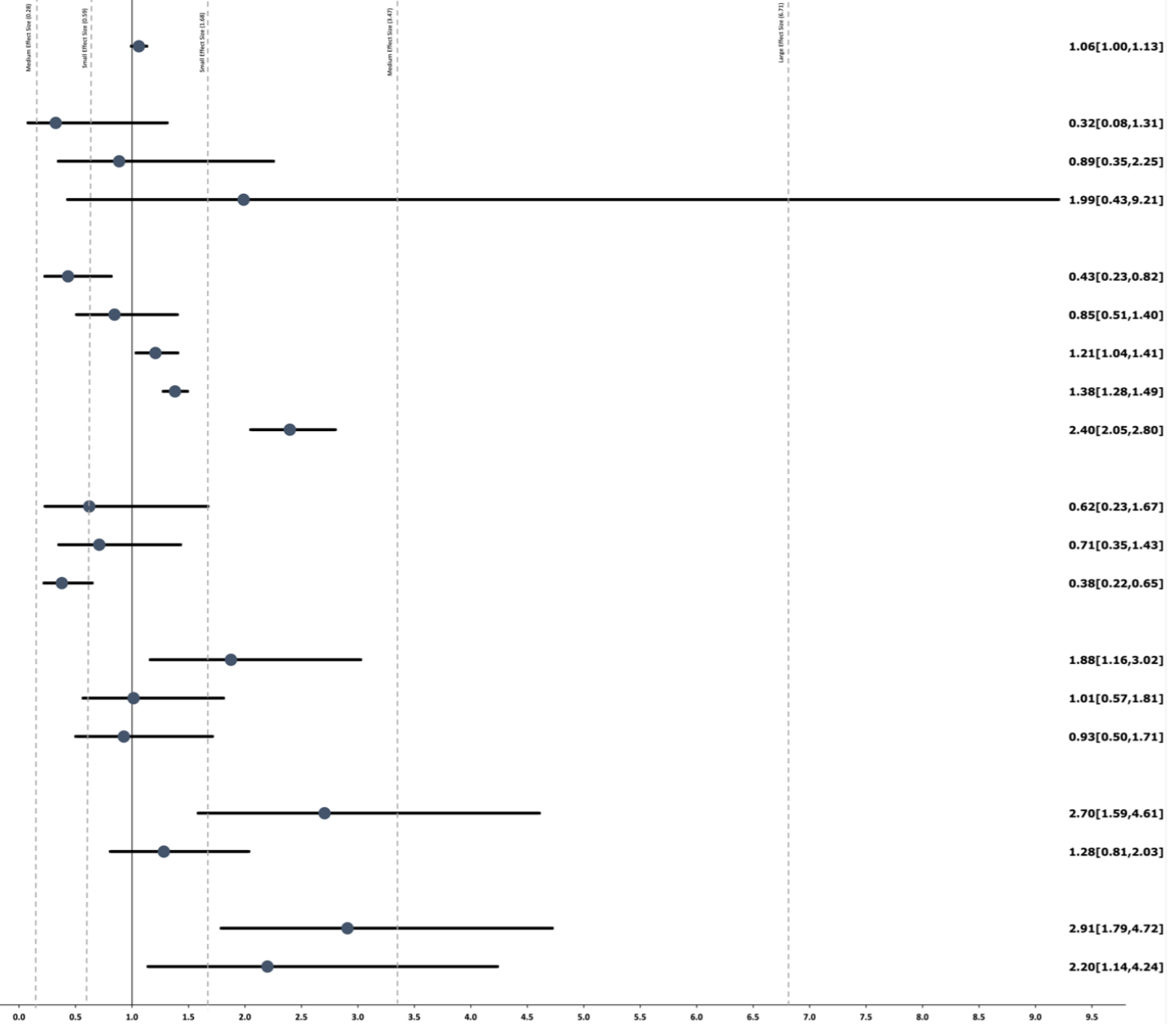
Current smokers/vapers

Ex-smokers

HMB (Low Risk, ref.)

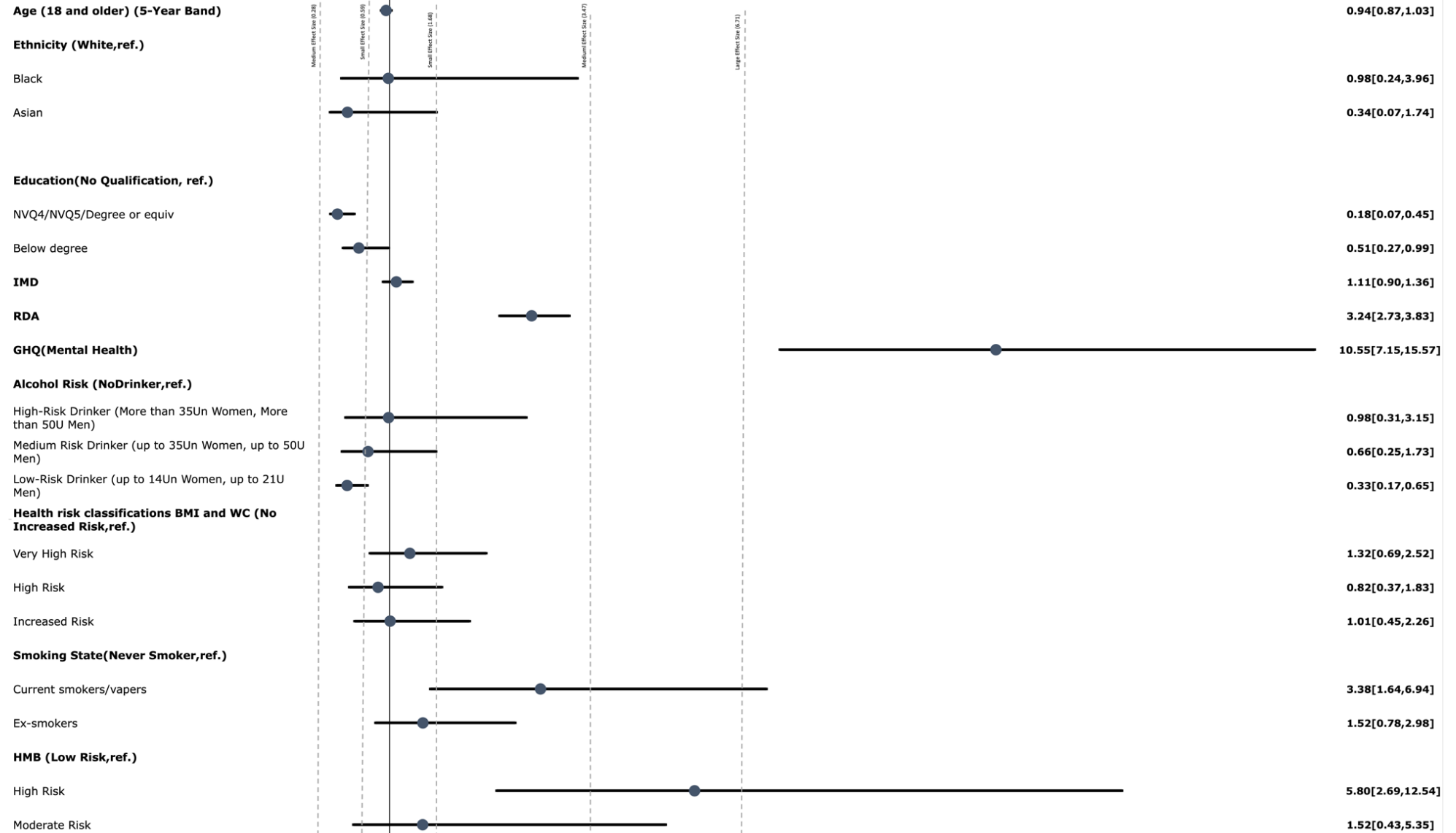
High Risk

Moderate Risk

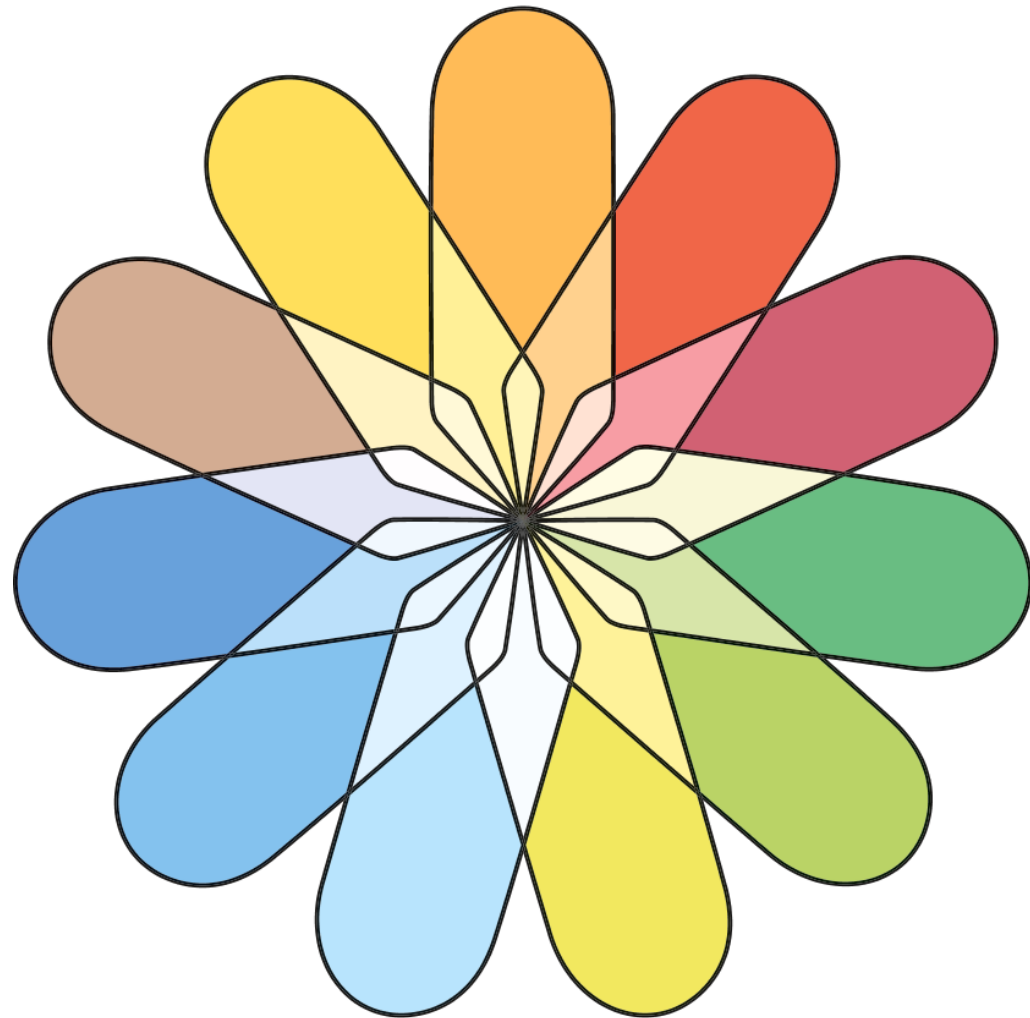


Predictors ("Extreme Problems" from "No Problems")

Odds Ratio[CI95%]



Quality of life dimensions



Urban Context

Economy
Demography

- Income & Jobs
- Housing Conditions
- Health
- Education
- Environmental Quality
- Personal Security
- Civic Engagement
- Work-Life Balance
- Infrastructure & Services
- Mobility
- Culture & Leisure