Obesity effect on outpatient mental health

Team Hungary-Sri Lanka

Choi, Jane , Han, Da Hee, Mestre, Luis Miguel, & Xu, Xiao

Indiana University

Executive summary

- An analysis of a survey done by <2018 National Survey on Drug Use and Health> claiming ***"Obese people are more likely to have outpatient mental health."***
- There seems to be **sufficient evidence to show effect** on the probability of being an outpatient mental health regarding BMI
- There seems to be other variables : **Internalizing problems, Substance use behaviors, Sociodemographic** which have effect on the probability of being an outpatient mental health regarding BMI

Are obese people more likely to have outpatient mental health?

According to a paper on **“Mental Illness and Obesity”**:

Obesity develops from a combination of environmental effects and genotype, both of which can present as heightened risk factors in people with mental illness…

There is a debate in some health communities whether or not obesity is associated with mental diseases

The experiment

"National Survey on Drug Use and Health 2018"

(Study Design: Cross Sectional Study)

A total final sample of 67,791 interviews was obtained who answered questionnaires from a sample of each of the 50 states:

This dataset considers one of the best sources of information ***use of illicit drugs, smoking tobacco or cigarettes and mental diseases among US adults***

https://datafiles.samhsa.gov/study-dataset/national-survey-drug-use-and-health-2018-nsduh-2018-ds0001-nid18758

Main Variable Explanation

Outcome: OutPatient Mental Health treatment in past year(Yes/No)

Exposure: BMI (Body Mass Index)

Alcohol Consumption : past month use(yes/no)

Suicide Thinking: seriously thought of killing self(yes/no)

Education Level

Income: Total Family Income

Building a model

Main model: **Weighted Logistic Regression**

Weight: person-level analysis weights divided by the sum

Model 1:
Using all variables
(Concentrating on BMI)

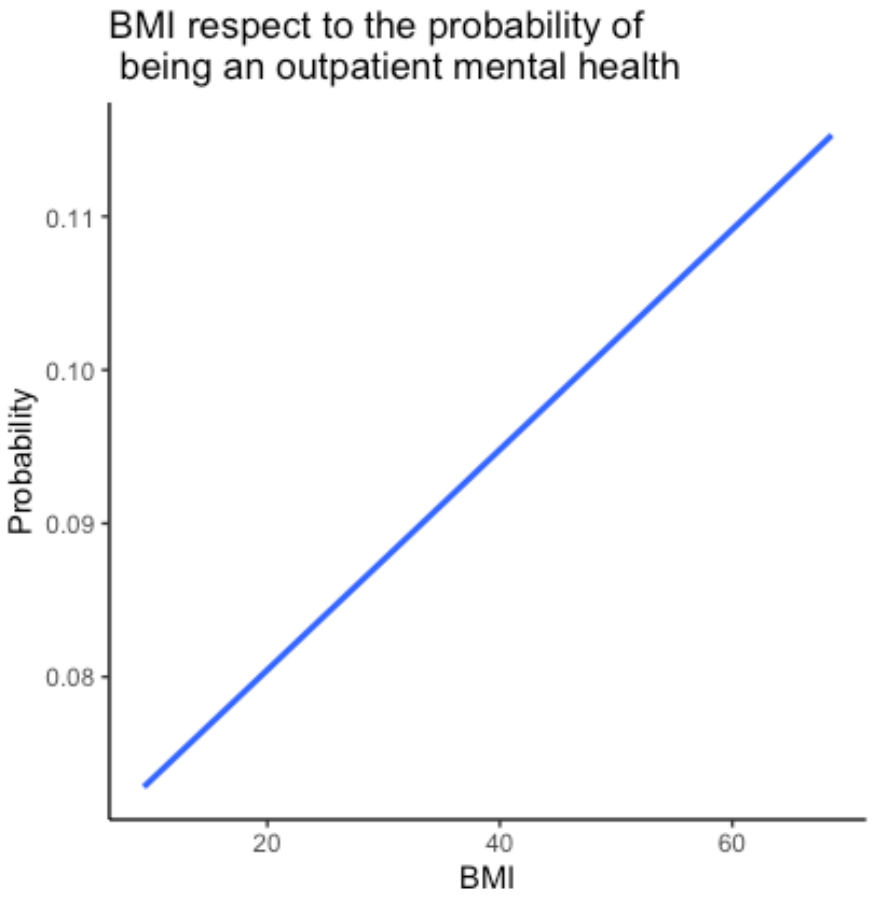
- Internalizing problems (how often felt hopeless…)
- Substance use behaviors (cigarettes … drug use)
- Sociodemographic (age, gender, race…)

Model 2:
BMI & Main variables
(Checking interaction)

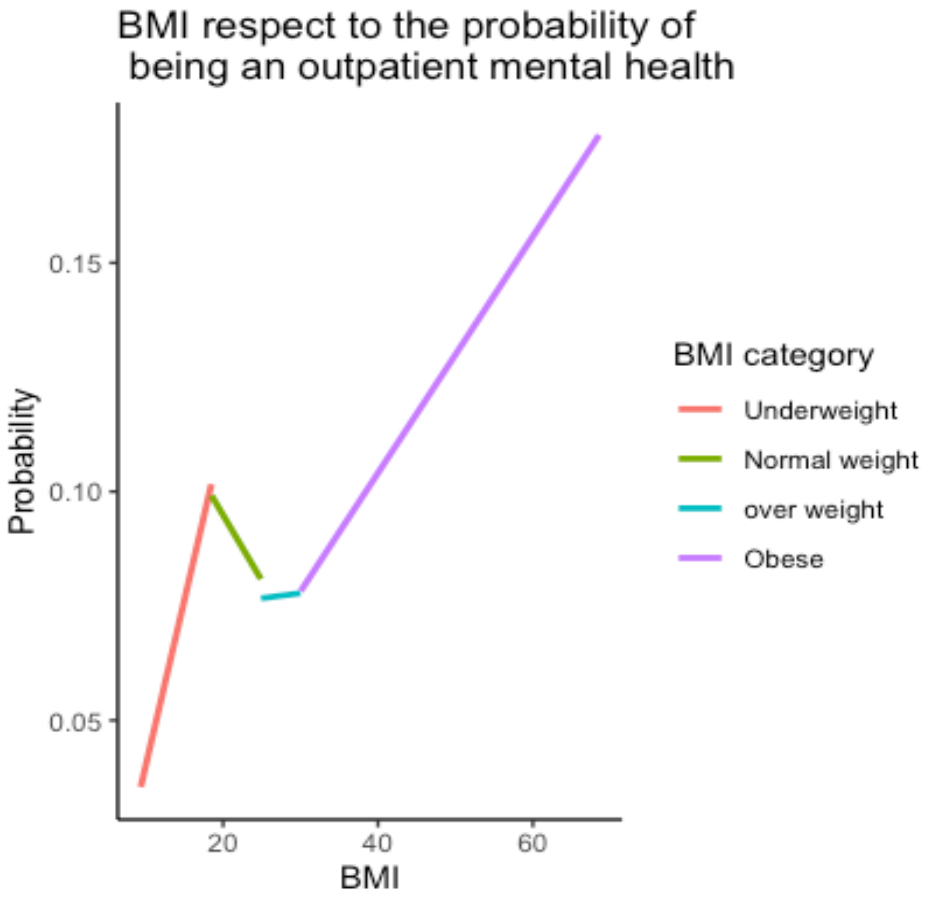
Focusing on these variables…
-Alcohol consumption
-Suicide Thinking
-Education Level
-Income

Model 1: Weighted Logistic model (BMI aspect)

Using **LINEAR MODEL**



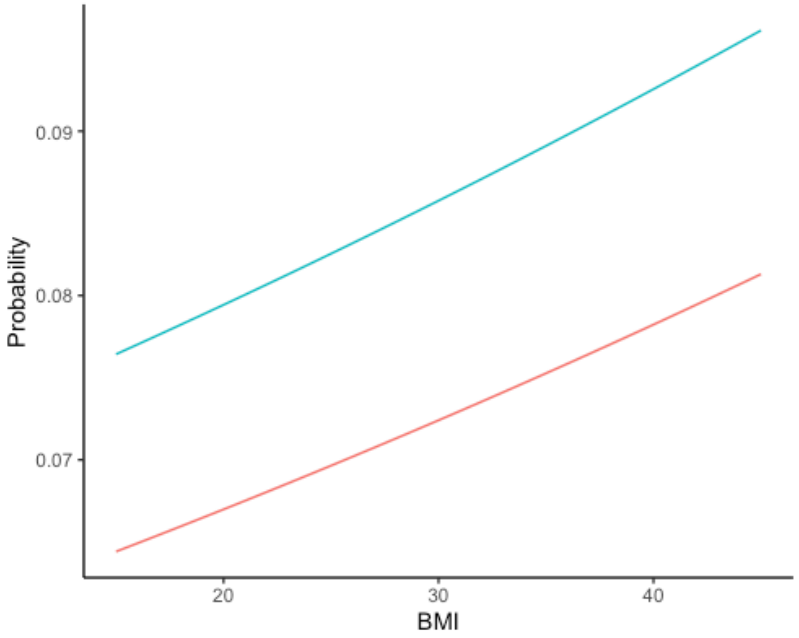
Using **GAM** (With Categories of BMI)



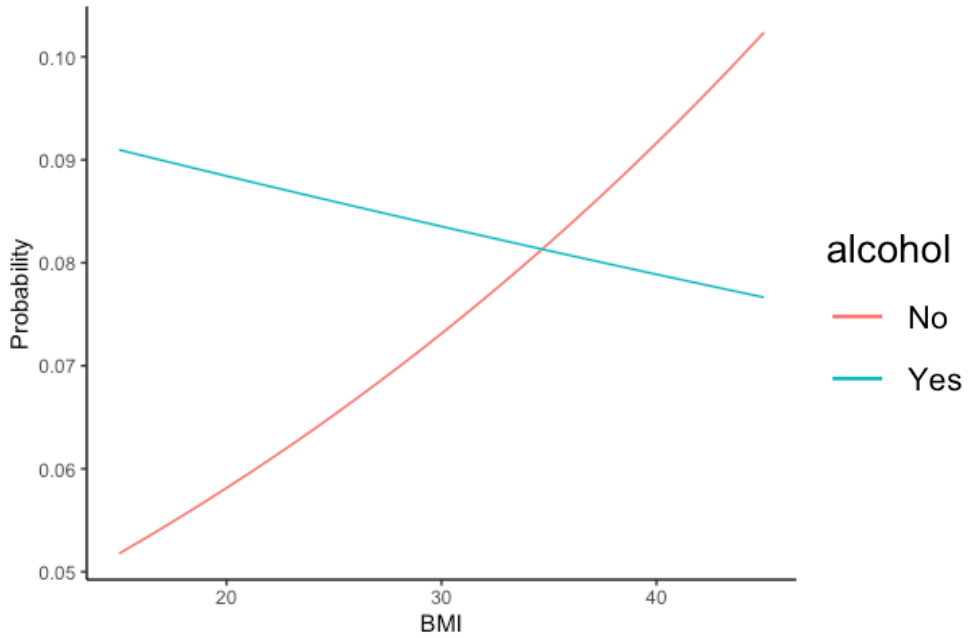
Obesity Paradox

Model 2: (1) BMI and Alcohol Consumption

Additive Model with BMI & alcohol consumption



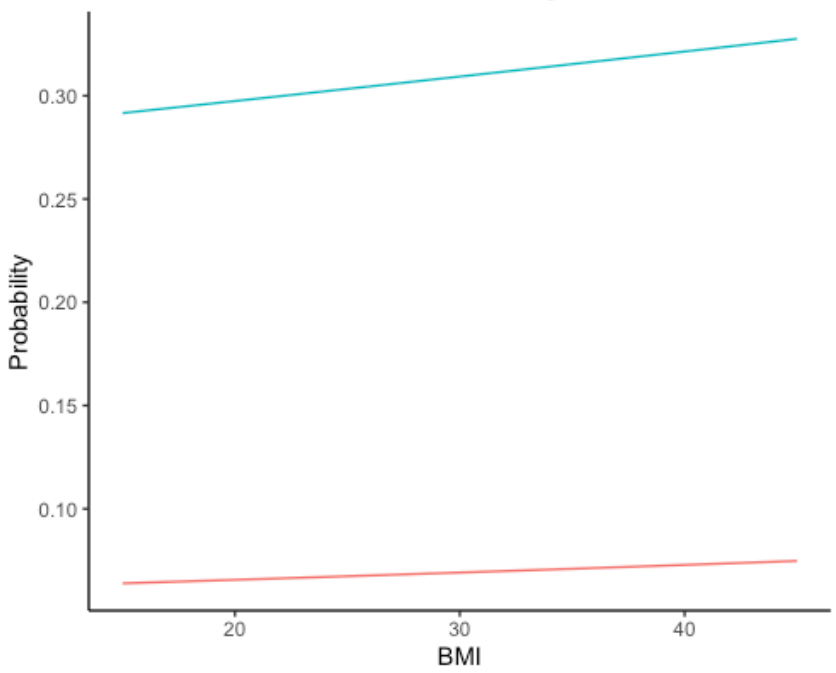
Interaction Model with BMI & alcohol consumption



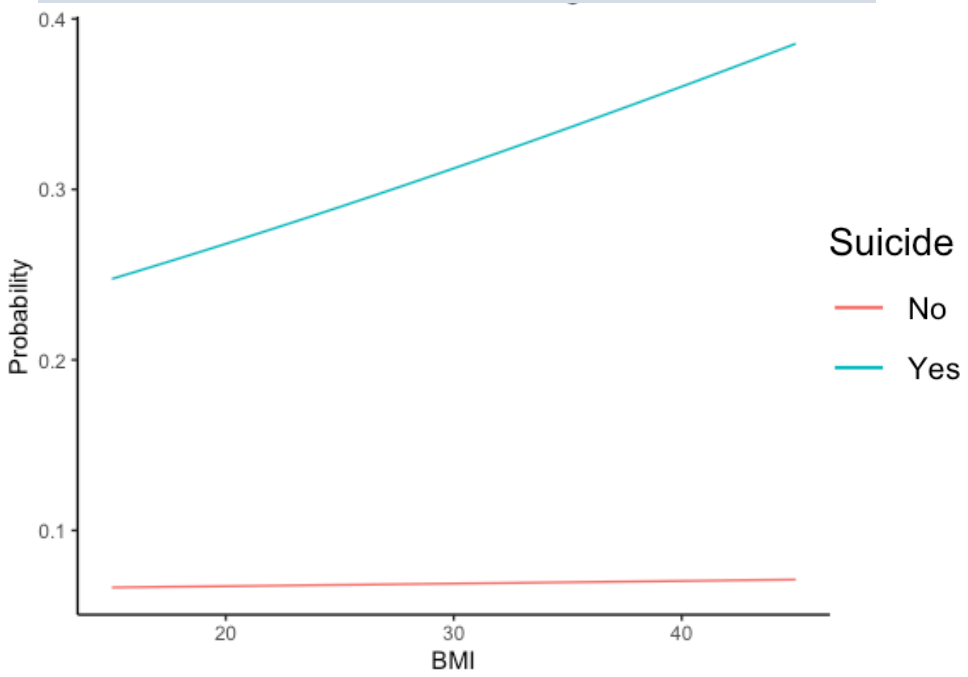
Can't ignore interaction with Alcohol Consumption

Model 2: (2) BMI and Suicide Thinking

Additive Model with BMI & Suicide Thinking



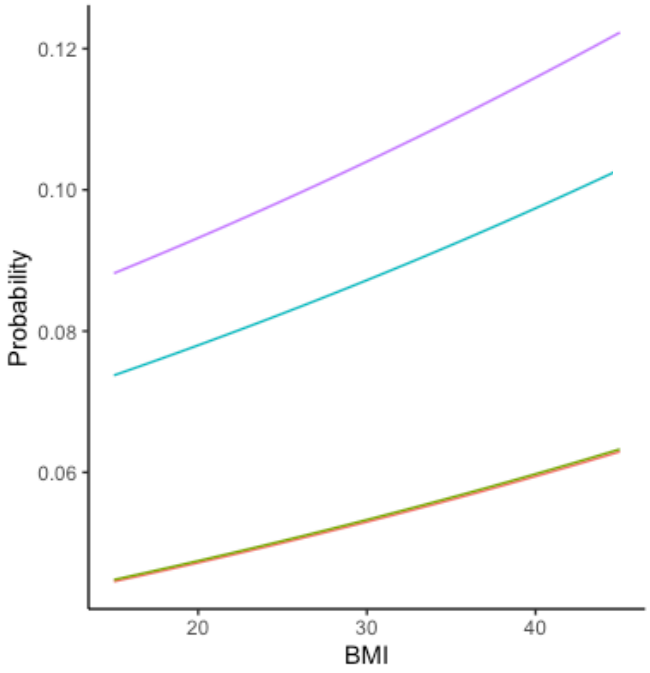
Interaction Model with BMI & Suicide Thinking



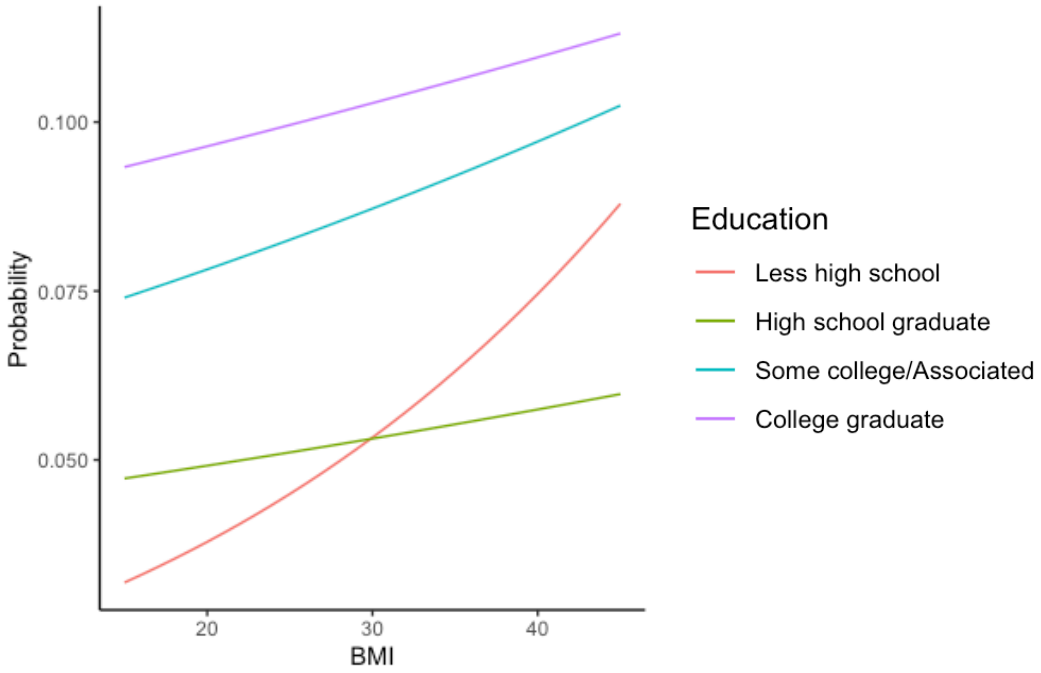
Can't ignore interaction with Suicide Thinking

Model 2: (3) BMI and Education Level

Additive Model with BMI & Education Level



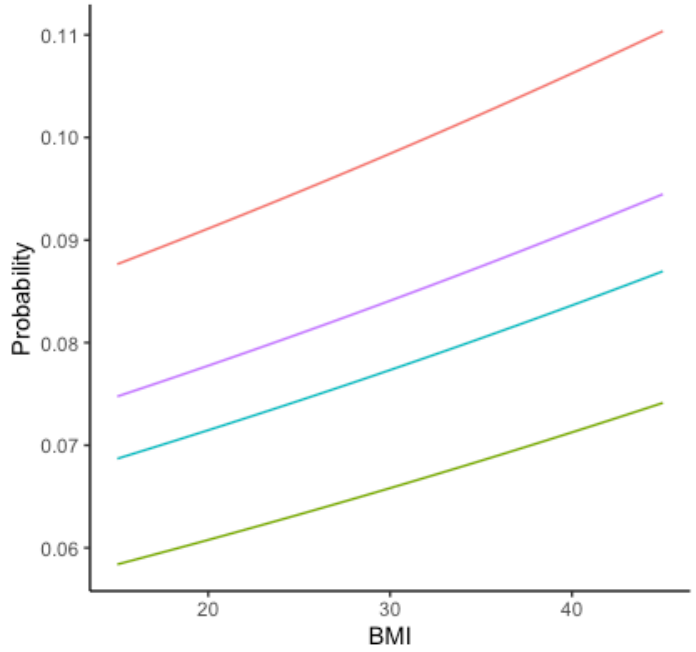
Interaction Model with BMI & Education Level



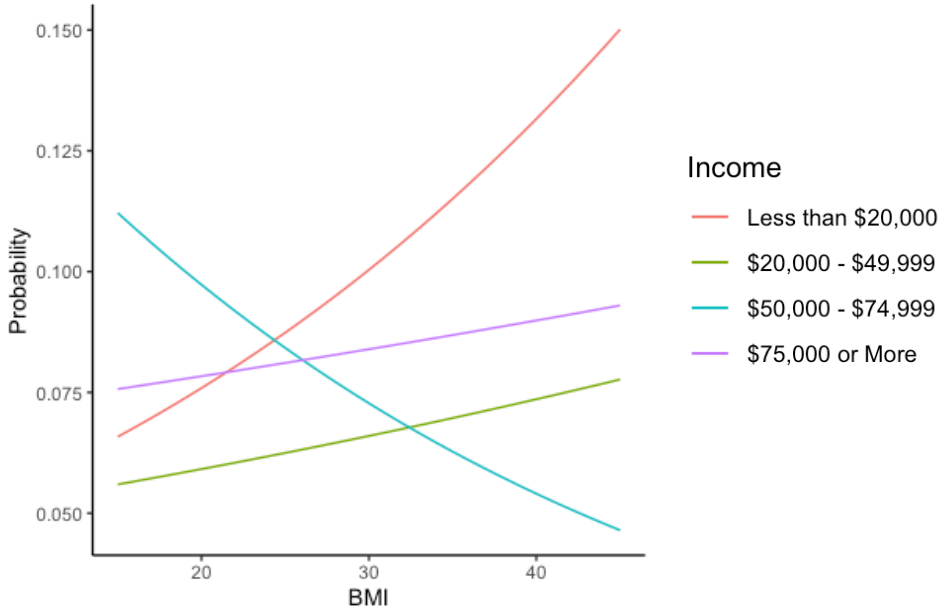
Can't ignore interaction with Education Level

Model 2: (4) BMI and Income

Additive Model with BMI & Income



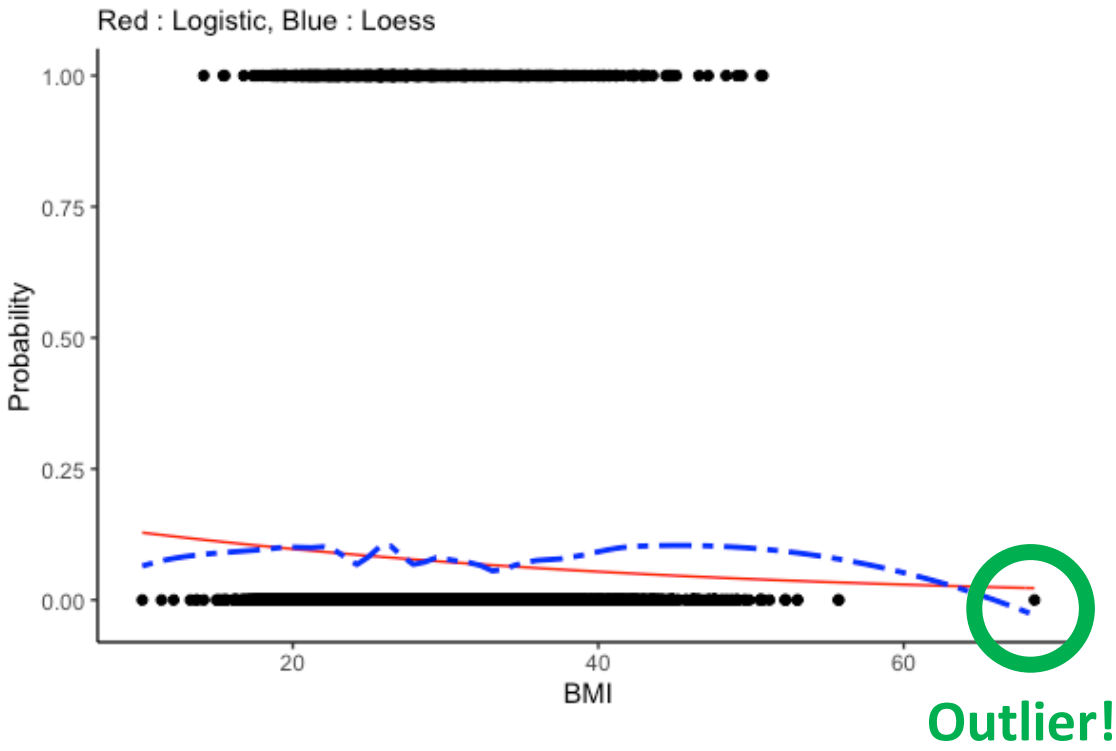
Interaction Model with BMI & Income



Can’t ignore interaction with Income

Why does $50,000 - $74,999 have a negative slope ?

Comparison between logistic and Loess among those earning **$50,000 - $74,999**



Preliminary Conclusions

- Those who are **underweight and obese have higher risk of being a mental patient** compare to those being overweight and normal weight.
- **Alcohol Consumption:** Has an interaction in the association of BMI and the probability of being outpatient mental health
- **Suicide Thinking:** Those who have suicide thinking increases their risk of being outpatient mental health as the BMI increases
- **Education Level:** All education levels have the same pattern: Higher the BMI higher the risk of being a mental health patient.
- **Income:** There is a tendency that lower the income higher the risk of being a mental patient (higher the BMI higher the risk). However, group 50K-74.99K have a different behavior, perhaps to unmeasured confounding.

Next steps:

Interpretation of Odds Ratio

Seeing impacts of other variables

Try other models: Loess, gam