

YiyingWu, Yi Huang

January 14, 2024

- ① Introduction
- ② Methodology
- ③ Results
- ④ Discussion
- ⑤ References

# Introduction: Background

## Background

- Hypertension is a leading risk factor for cardiovascular diseases, affecting public health worldwide and prominently in the U.S.

## Problem

- Following an initial improvement in blood pressure control among U.S. adults with hypertension from 1999-2000 to 2007-2008, there was a stagnation and subsequent decrease post-2013 (Muntner P, et al., 2020).

## Motivation

- This study is motivated by the need to investigate the reasons behind this decline and to identify factors contributing to the diminishing control of hypertension in recent years.

## Study Objective

- Examining the trends, awareness, and medication use in stage 2 hypertension among U.S. adults.
- Assessing the impact of demographic factors and comorbid conditions on hypertension control.

# Methodology

# Methodology

- 1 Weighting and multiple year adjustment
- 2 Multiple Imputation to address missing data
- 3 Logistic Regression Models (Dobson, 2008):

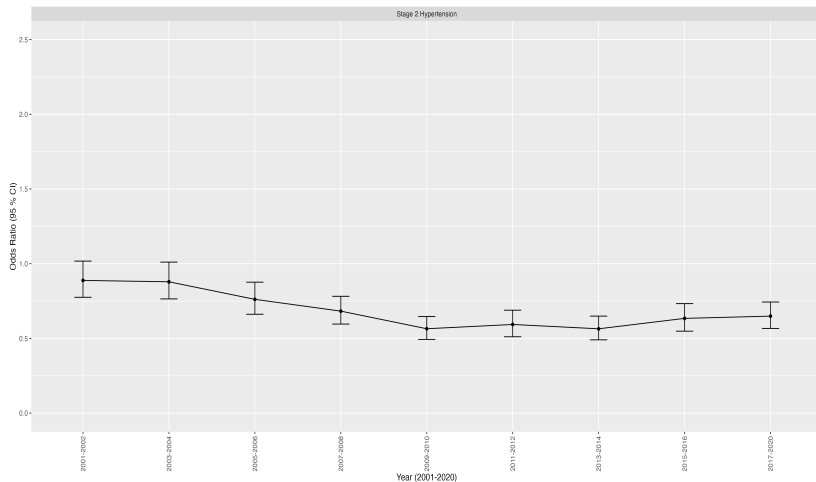
Suppose there are  $n$  covariates  $X_i, i = 1, \dots, n$ , the model can be expressed as:

$$\log\left(\frac{\pi}{1-\pi}\right) = X\beta = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n$$

- $\pi$  is the risk
- $\frac{\pi}{1-\pi}$  is the odds
- $\beta_0$  is the log odds for  $X_i' s = 0$
- $\beta_i$  is the log odds ratio per unit change of  $X_i$ , holding all other covariates fixed

# Results

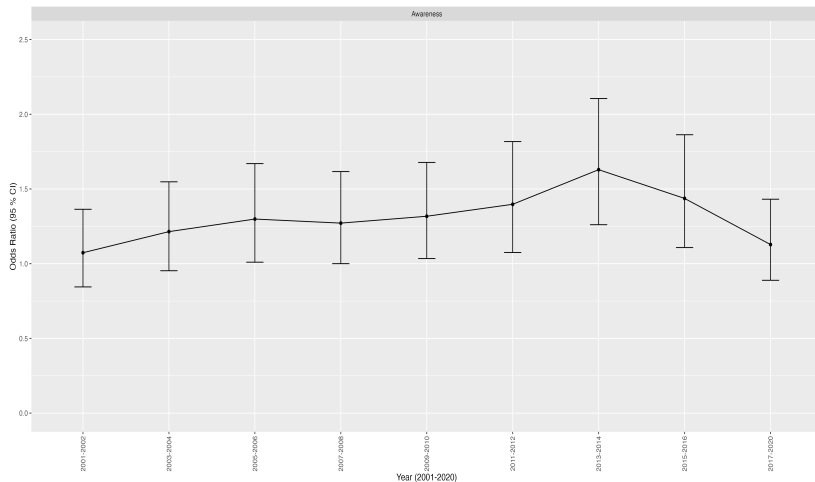
# Results



**Figure 1: OR (95% CI) of Stage 2 Hypertension**

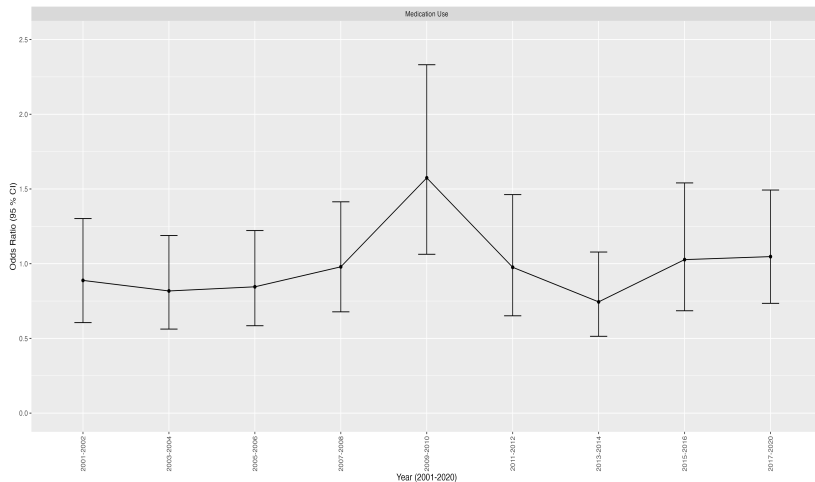


# Results



**Figure 2: OR (95% CI) of Awareness**

# Results



**Figure 3:** OR (95% CI) of Self-reported Antihypertensive Medication Use

# Discussion

# Discussion

# References

- 1 Dobson, A.J. (2008) An introduction to generalized linear models, Third Edition. Chapman & Hall.
- 2 “Facts about Hypertension.” Centers for Disease Control and Prevention, 6 July 2023. URL <http://www.cdc.gov/bloodpressure/facts.htm/> [Accessed 22 Dec. 2023.]
- 3 Muntner P, et al. (2020) Trends in Blood Pressure Control Among US Adults With Hypertension, 1999-2000 to 2017-2018. JAMA 324(12):1190–1200. <https://doi.org/10.1001/jama.2020.14545>
- 4 “Nhanes tutorials - Variance Estimation module”. Centers for Disease Control and Prevention, URL <https://wwwn.cdc.gov/nchs/nhanes/tutorials/VarianceEstimation.aspx> [Accessed 22 Dec. 2023.]

# References

- ⑤ “Nhanes tutorials - weighting module”. Centers for Disease Control and Prevention, URL  
<https://wwwn.cdc.gov/nchs/nhanes/tutorials/Weighting.aspx>  
[Accessed 22 Dec. 2023.]
- ⑥ Rubin, D.B. (2018). Flexible Imputation of Missing Data, Second Edition. Chapman and Hall/CRC.