

Genetic, Lifestyle, and Social Factors in Hypertension and Cardiac Disease

Sanjana Nallapaneni, Lauren Cruz, MPH, and Patrick Osei-Owusu, PhD

Case Western Reserve University, School of Medicine, Department of Physiology and Biophysics

Background

- My practicum site was the CWRU Department of Physiology and Biophysics (2210 Circle Dr, Cleveland, OH 44106).
- I worked at the Osei-Owusu lab which investigates genetic markers in hypertension and heart disease which inspired me to examine this concept in the context of public health.

Population

The population I aimed to serve was the Cleveland community by providing education to CWRU campus members and those attending the Greater Cleveland Food Bank's Euclid Food Pantry and by conducting research on this topic.

Learning Objectives

- Create infographics on factors in hypertension and heart disease based on a literature review and make computer models that includes predisposition, lifestyle, and social factors.
- Evaluate and analyze genetic and environmental factors in hypertension and cardiac disease and generate forward-facing conclusions
- Understand and remember social determinants of health, lifestyle, and genetic factors in hypertension and cardiac disease and how to communicate this information to communities

Activities

The Osei-Owusu lab looks at genetics and cardiac disease and hypertension. My role was to apply this idea to public health and consider for environmental factors.

My responsibilities included:

- Conducting a literature review on genetics, lifestyle, and social factors in hypertension and heart disease risk
- Making infographics from this literature review for both a high and low health literacy audience
- Applying this research to an NHANES analysis

Deliverables

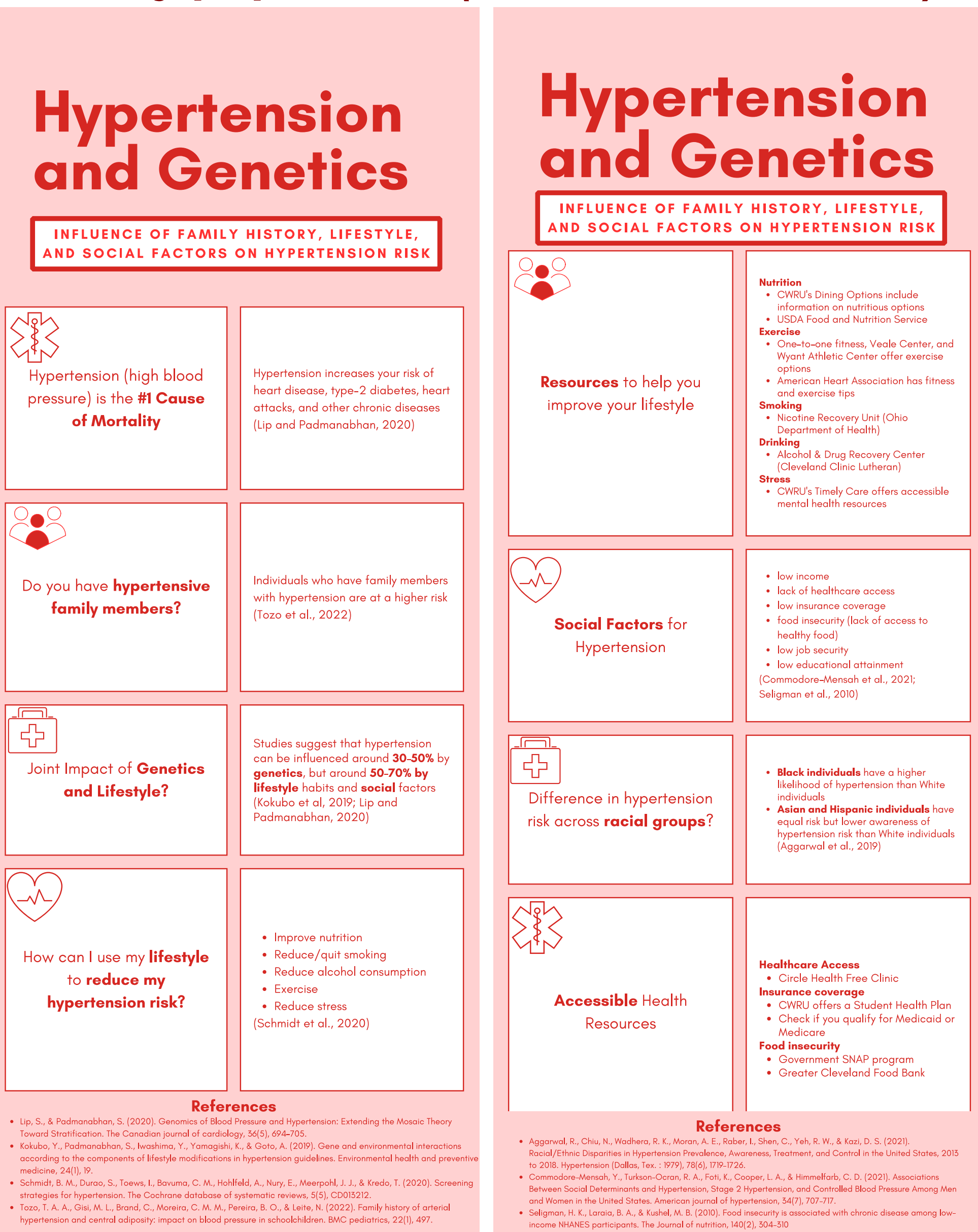
- Infographic for CWRU community
- Infographic for Euclid Food Pantry
- Literature Review
- NHANES analysis



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Figure 1— Infographic for high health literacy population (Created with Canva)



Methods and Results

To generate the statistical models, I created logistic regression models. I then conducted a Z-test to generate the p-values.

Figure 2—Conceptual Model

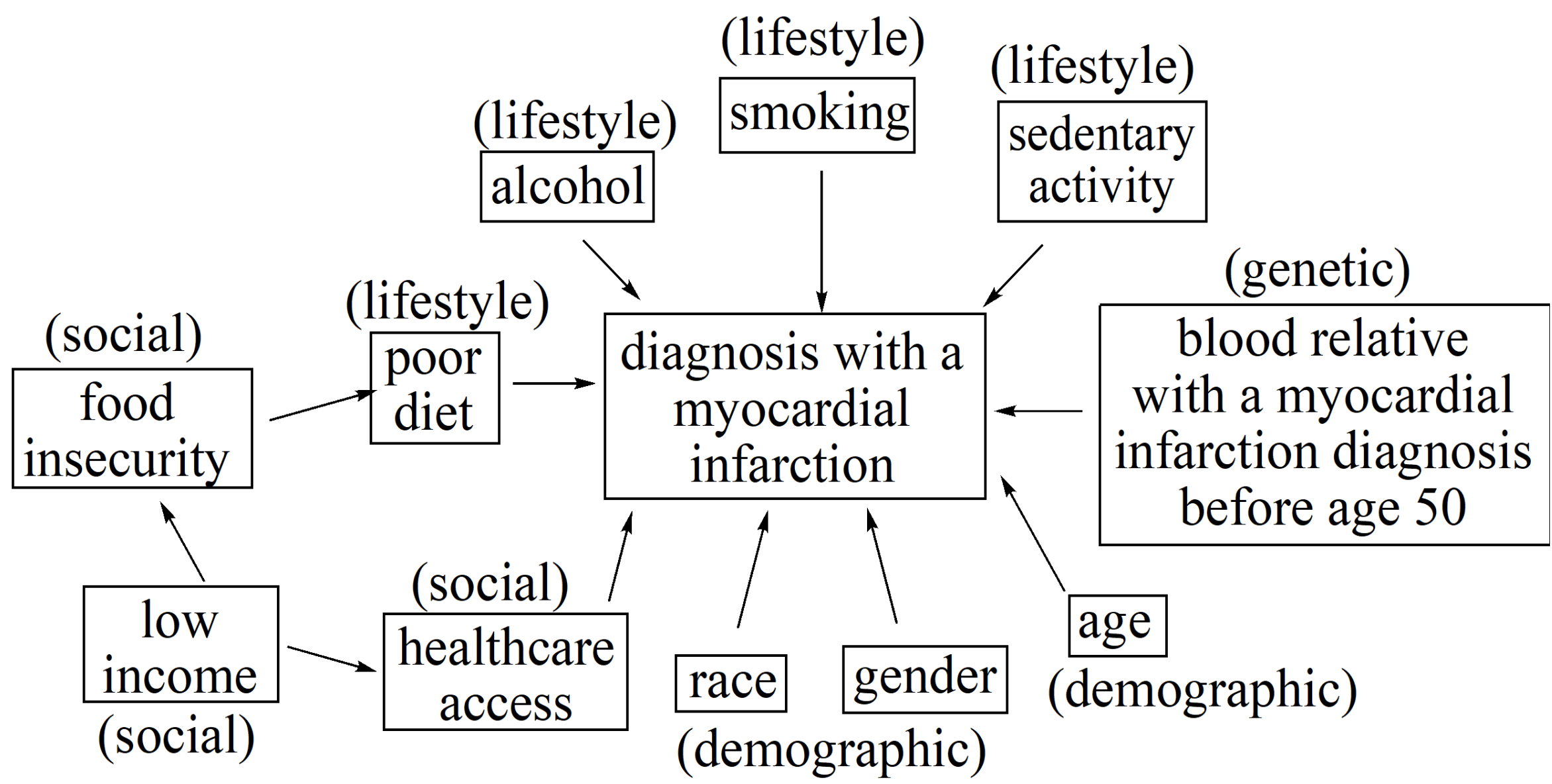


Table 1—NHANES 2017-2020 Raw Data Analysis

Variable	Estimate	Odds Ratio (OR)	Std. Error (OR)	z value	Pr(> z)
Blood relative who had an MI under age 50	1.16	3.20	1.11	10.5	<2.00e-16***
Food security level	0.230	1.26	1.05	5.05	4.33e-07**
Healthcare access	-0.693	0.500	1.18	-4.14	3.43e-05***
Diet grade	0.0699	1.07	1.06	1.19	0.235
Fast food consumption	-0.0675	0.935	1.03	-2.47	0.0136*
“Ready-to-Eat” food consumption	-0.0303	0.970	1.02	-1.95	0.0508
Insurance coverage	0.961	2.61	1.21	4.94	7.96e-07***
Alcohol level	-0.101	0.904	1.02	-6.12	9.24e-10***
Sedentary activity	0.0116	1.00	1.00	5.03	4.84e-07
Current smoking	0.191	1.21	1.07	2.67	0.00768**
Poverty level	-0.173	0.841	1.06	-3.00	0.00271**
Age	0.0682	1.07	1.00	16.2	<2.00e-16***
Gender	-0.963	0.382	1.12	-8.25	<2.00e-16***
Income: poverty ratio	-0.167	0.846	1.04	-4.79	1.65e-06***
Self-report race of Black	-0.629	0.533	1.15	-4.59	1.65e-06***
Self-report race of Hispanic	-0.830	0.436	1.17	-5.18	2.26e-07***
Self-report race of Asian	-1.44	0.237	1.30	-5.48	4.19e-08***
Self-report race of Other	-0.139	0.870	1.26	-0.612	0.541

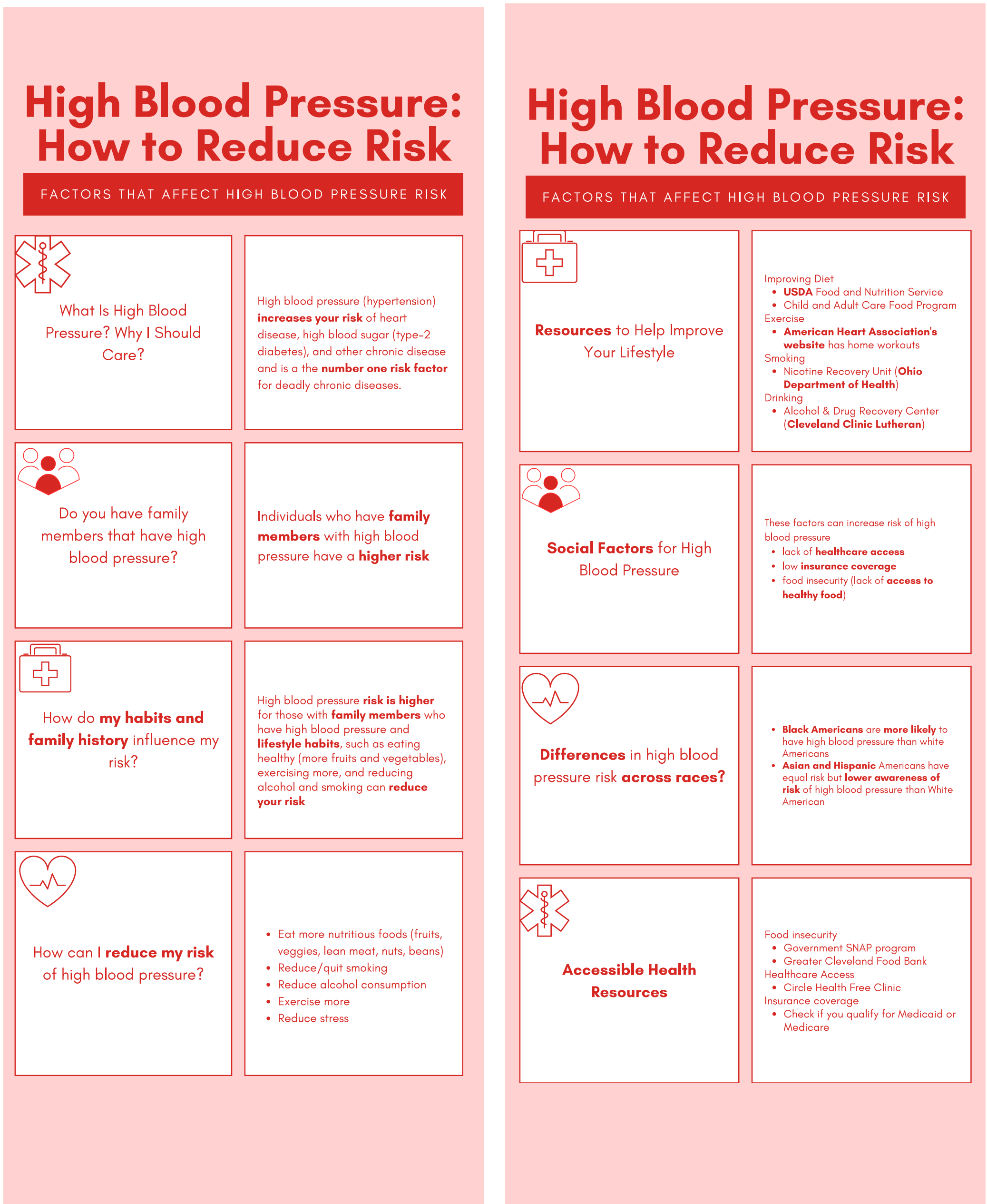
Lessons Learned

- (1) Since I am looking at myocardial infarctions as an endpoint for my capstone, I need to focus on this specific condition in my literature review.
- (2) While making educational materials, health literacy is valuable to consider.
- (3) When combining datasets, only considering individuals who answered all surveys reduces statistical power.
- (4) Some raw data associations are in the opposite direction as other literature, so examining confounders and covariates are next steps.

Public Health Implications

- My community education helped raise Cleveland's awareness of risk factors for hypertension and heart disease.
- For the NHANES analysis, the data I generated can lead to forward facing conclusions which can be analyzed in the context of public health literature.

Figure 3— Infographic for low health literacy population (Created with Canva)



Acknowledgements

I would like to thank the Osei-Owusu Lab for technical and intellectual guidance. Special thanks to Dr. Dana Crawford, the Crawford Lab, and the Cullen lab for providing insight for dataset selection, orienting my question, and making statistical models in R.