Age and Beyond

Investigating Hypertension Risk Factors

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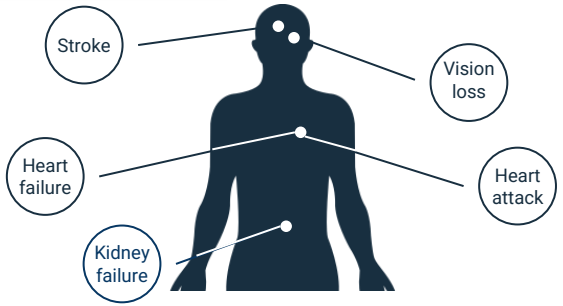
HYPERTENSION: INTRODUCTION & RESEARCH QUESTION

Definition and Health implications

Systolic blood pressure
higher than
140
mmHg

Diastolic blood pressure
higher than
90
mmHg



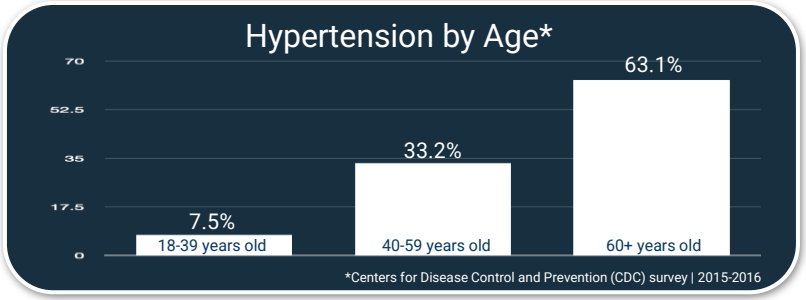
Risk factors

MAIN (investigated in this project)

- ***Age***
- Race
- Gender
- Overweight/obesity
- Sedentary lifestyle
- Alcohol

ADDITIONAL (**NOT** investigated in this project)

- Salt consumption
- Tobacco use
- Excessive stress
- Family history
- Genetic



Research Question: *How does age relate to systolic blood pressure (SBP), and to what extent does this relationship change when considering additional risk factors?*

DATA | MODELS | VISUALIZATIONS

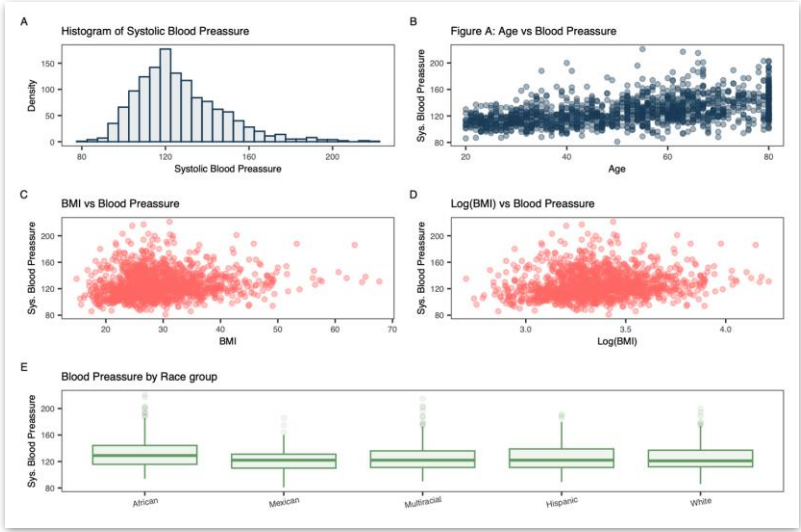
Data

- 2017-2018 National Health and Nutrition Examination Survey (**NHANES**), conducted by the CDC's National Center for Health Statistics (NCHS).
- Sample includes ***non-institutionalized U.S. civilians over 20 years old***.
- The survey collects **person-level demographic, health, and nutrition information** through a ***standardized process***.

Models specifications

- **Simplest model:** SBP versus Age
- More established hypertension risk factors ***sequentially*** incorporated:
  - Body Mass Index (BMI)
  - Physical inactivity (sedentary hours per day)
  - Alcohol consumption (drinks per day)
  - Race
  - Gender
- **Log-transformation of BMI; interaction term between BMI and sedentary**

Visualizations



Summary statistics of variables used

Variable	Observations	Mean	Std. Dev	Median
Sys. Blood Preassure (mmHg) (Y)	1325	127	21	123
Age (X)	1325	52	17	54
BMI (X)	1325	30	7.2	28
Sedentary hours/day (X)	1325	5.5	3.3	5
Alcoholic drinks/day (X)	1325	1.6	2.1	1

RESULTS | LIMITATIONS | CONCLUSIONS

OLS regression summary

Table 1: Systolic Blood Pressure and Risk Factors: OLS Regression Summary

	Dependent variable:		
	Systolic Blood Pressure (mmHg)		
	(1)	(2)	(3)
Age	0.519***	0.516***	0.541***
	(0.017)	(0.017)	(0.018)
log(BMI)		11.420***	12.553***
		(1.371)	(2.609)
Sedentary hrs/day			0.940
			(1.297)
log(BMI):Sedentary			−0.310
			(0.383)
Alcohol drinks/day			0.502**
			(0.177)
Mexican American			−4.381***
			(1.112)
Other/Multi-Racial			−4.599***
			(0.955)
Other Hispanic			−5.125***
			(1.288)
White			−6.470***
			(0.870)
Male			1.666**
			(0.620)
Constant	100.397***	62.087***	60.250***
	(0.813)	(4.578)	(8.835)
Two-model F-test Pr(>F)(vs lhs model)	N/A	1.306e-17 ***	1.314e-14 ***
Observations	3,214	3,214	3,214
Adjusted R^2	0.215	0.232	0.250
F Statistic	878.544***	486.149***	107.909***
Note:	*p<0.05; **p<0.01; ***p<0.001 Race: African American is omitted; gender: female is omitted; last F-stat is vs constant		

Statistical significance

STATISTICALLY SIGNIFICANT
(S.L. = Significance Level)

- ***Age (0.1% S. L.)***
- BMI (0.1% S.L)
- Race (0.1% S.L)
- Gender (1%S.L)
- Alcohol (1% S.L)

STATISTICALLY *IN*SIGNIFICANT

- Sedentary lifestyle

Practical significance

- The ***results addressed the main research question*** regarding SBP and age, and regarding the additional key risk factors, which are aligned with existing peer-reviewed publications.
- The significant F-statistic for all models confirms that the included ***input variables help to describe changes in SBP.***

Limitations

- **Population representation and modeling:** skewing towards the elderly population can *compromising the I.I.D. assumption*.
- **Data availability on other factors:** lacks comprehensive data on factors like salt overconsumption (environmental) or family history (genetic).
- **Medical expertise:** due to lack of domain expertise, we relied on variables discussed in literature, potentially overlooking relevant factors.

Conclusions: *Our study highlights a significant linear relationship between age and SBP, which will be of interest for healthcare institutions seeking to develop preventative strategies and promote healthy lifestyles.*

Thank You

For your attention