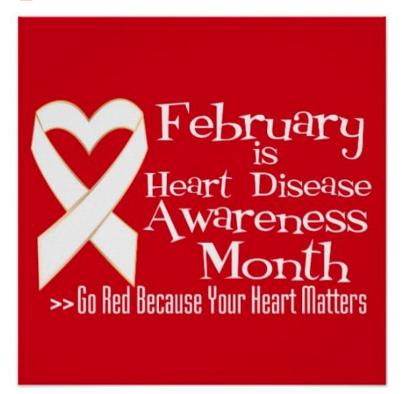
Using Personal Risk Indicators to identify Heart Disease in patients



Presented by: Elijah A, Ridhwaan A, Briauna Y, Evan Z

Why is this important?

- According to CDC, heart disease or CVD (cardiovascular disease) is the leading cause of death in the U.S.
- The increase in hospital admissions since 2020 could impact the quality of care, so providing something to help clinical staff quickly and effectively assess potential heart disease in a patient, is useful.
- Heart disease prevention only starts with awareness!!



Variables

- Heart Disease
- BMI
- Smoking
- Alcohol Drinking
- Stroke
- Physical Health
- Mental Health
- Difficulty Walking
- Sex

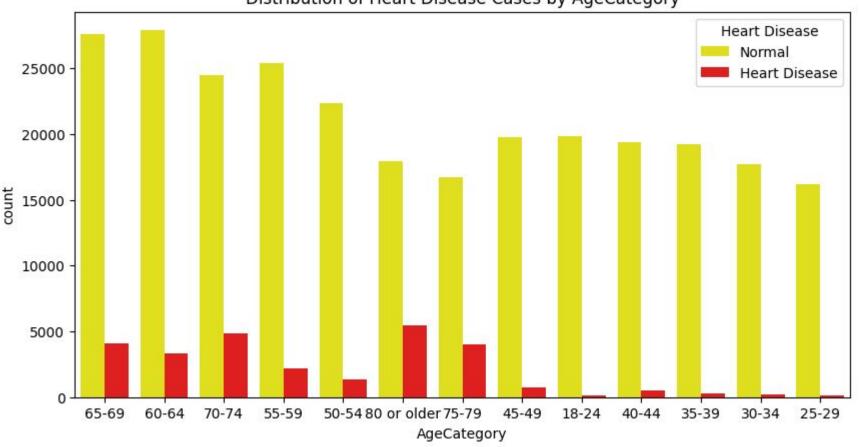


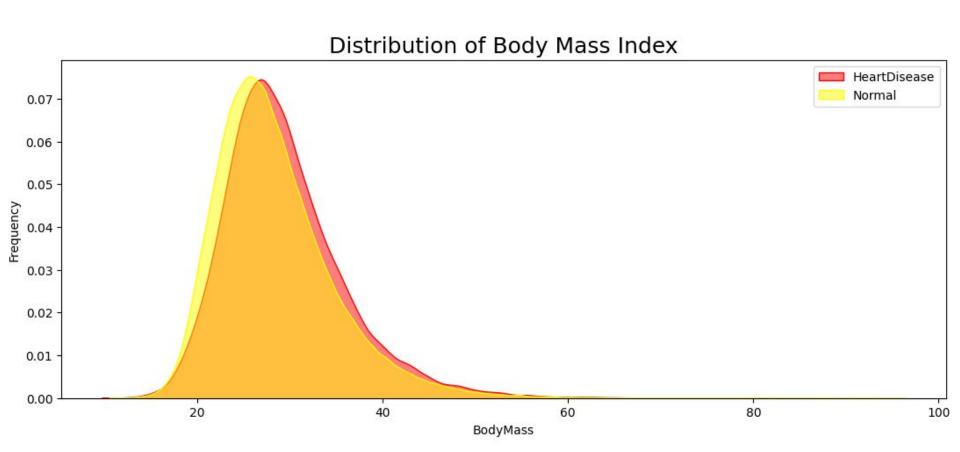


- Diabetic
- Physical Activity
- General Health
- Sleep Time
- Asthma
- Kidney Disease

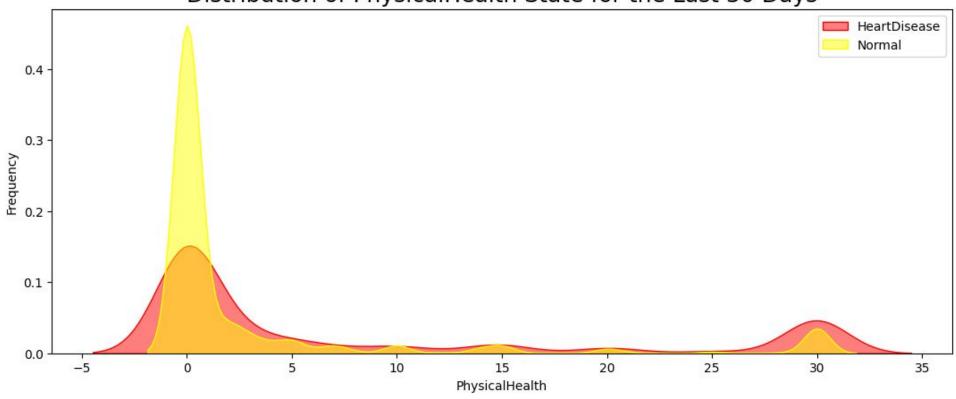


Distribution of Heart Disease Cases by AgeCategory

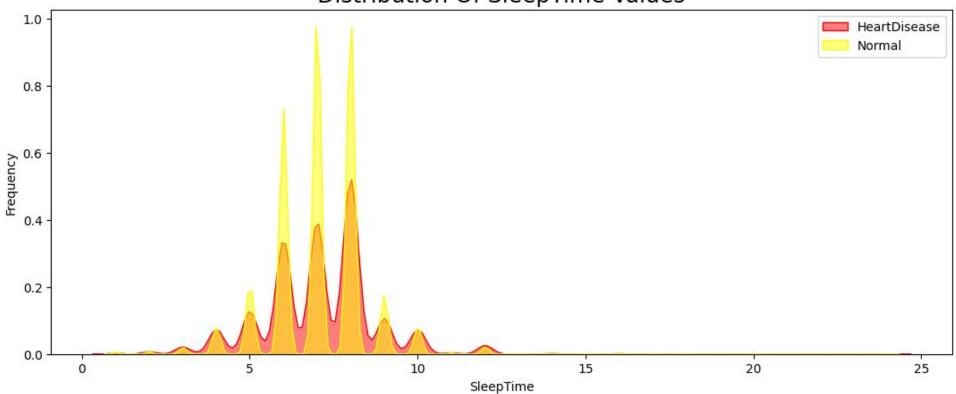




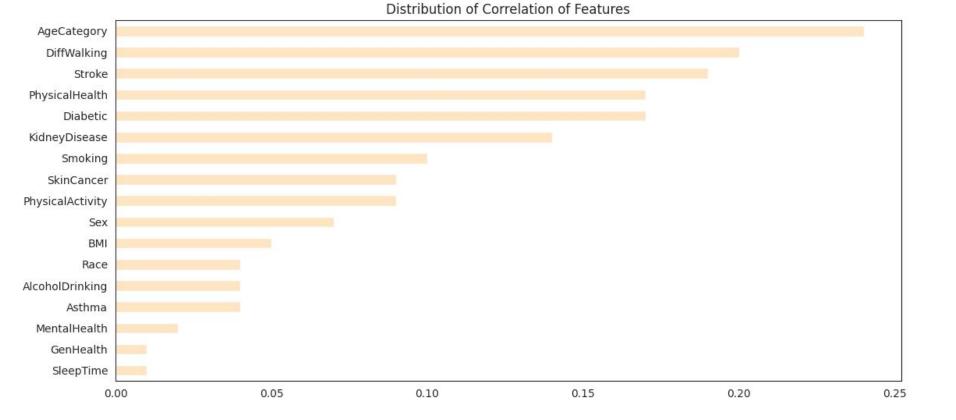
Distribution of PhysicalHealth State for the Last 30 Days







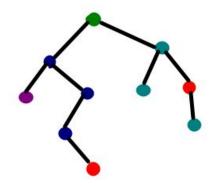
Correlation



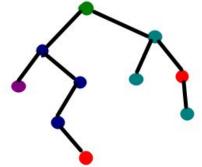
Correlation Between Variables

HeartDisease -	1	0.05	0.1	-0.04	0.19	0.17	0.02	0.2	0.07	0.24	0.04	0.17	-0.09	-0.01	0.01	0.04	0.14	0.09	1.0
ВМІ -	0.05	1	0.02	-0.04	0.02	0.1	0.06	0.18	0.02	-0.01	-0.03	0.2	-0.14	0.03	-0.05	0.09	0.05	-0.04	
Smoking –	0.1	0.02	1	0.11	0.06	0.11	0.08	0.12	0.09	0.13	0.08	0.05	-0.09	0.01	-0.03	0.02	0.03	0.03	- 0.8
AlcoholDrinking –	-0.04	-0.04	0.11	1	-0.02	-0.02	0.05	-0.04	0.01	-0.06	0.04	-0.06	0.02	0	-0	-0.01	-0.03	-0.01	
Stroke -	0.19	0.02	0.06	-0.02	1	0.13	0.04	0.17	-0	0.14	0	0.1	-0.07	-0.01	0.01	0.03	0.09	0.05	
PhysicalHealth -	0.17	0.1	0.11	-0.02	0.13	1	0.28	0.42	-0.04	0.11	0.01	0.15	-0.22	-0.04	-0.06	0.11	0.14	0.04	- 0.6
MentalHealth -	0.02	0.06	0.08	0.05	0.04	0.28	1	0.14	-0.1	-0.16	-0	0.02	-0.08	-0.01	-0.12	0.11	0.03	-0.04	
DiffWalking -	0.2	0.18	0.12	-0.04	0.17	0.42	0.14	1	-0.07	0.25	-0.01	0.2	-0.27	-0.05	-0.02	0.1	0.15	0.06	
Sex -	0.07	0.02	0.09	0.01	-0	-0.04	-0.1	-0.07	1	-0.06	0.02	0	0.05	-0.01	-0.01	-0.07	-0.01	0.02	- 0.4
AgeCategory -	0.24	-0.01	0.13	-0.06	0.14	0.11	-0.16	0.25	-0.06	1.	0.17	0.2	-0.13	0.04	0.11	-0.06	0.13	0.27	
Race -	0.04	-0.03	0.08	0.04	0	0.01	-0	-0.01	0.02	0.17	1	-0.04	0.05	0.05	0.03	-0.01	0.01	0.14	
Diabetic -	0.17	0.2	0.05	-0.06	0.1	0.15	0.02	0.2	0	0.2	-0.04	1	-0.13	-0.01	0.01	0.04	0.15	0.03	- 0.2
PhysicalActivity -	-0.09	-0.14	-0.09	0.02	-0.07	-0.22	-0.08	-0.27	0.05	-0.13	0.05	-0.13	1	0.03	-0	-0.03	-0.08	0	
GenHealth -	-0.01	0.03	0.01	0	-0.01	-0.04	-0.01	-0.05	-0.01	0.04	0.05	-0.01	0.03	1	-0	0.01	-0.01	0.02	
SleepTime -	0.01	-0.05	-0.03	-0	0.01	-0.06	-0.12	-0.02	-0.01	0.11	0.03	0.01	-0	-0	1	-0.05	0.01	0.04	- 0.0
Asthma -	0.04	0.09	0.02	-0.01	0.03	0.11	0.11	0.1	-0.07	-0.06	-0.01	0.04	-0.03	0.01	-0.05	1	0.04	-0.01	
KidneyDisease -	0.14	0.05	0.03	-0.03	0.09	0.14	0.03	0.15	-0.01	0.13	0.01	0.15	-0.08	-0.01	0.01	0.04	1	0.06	0.2
SkinCancer -	0.09	-0.04	0.03	-0.01	0.05	0.04	-0.04	0.06	0.02	0.27	0.14	0.03	0	0.02	0.04	-0.01	0.06	1	-0.2
	HeartDisease -	- BMI	Smoking -	AlcoholDrinking -	Stroke -	PhysicalHealth -	MentalHealth -	DiffWalking -	Sex -	AgeCategory -	- Race	Diabetic -	PhysicalActivity -	GenHealth -	SleepTime -	Asthma -	KidneyDisease -	SkinCancer -	

Machine Learning Method Chosen



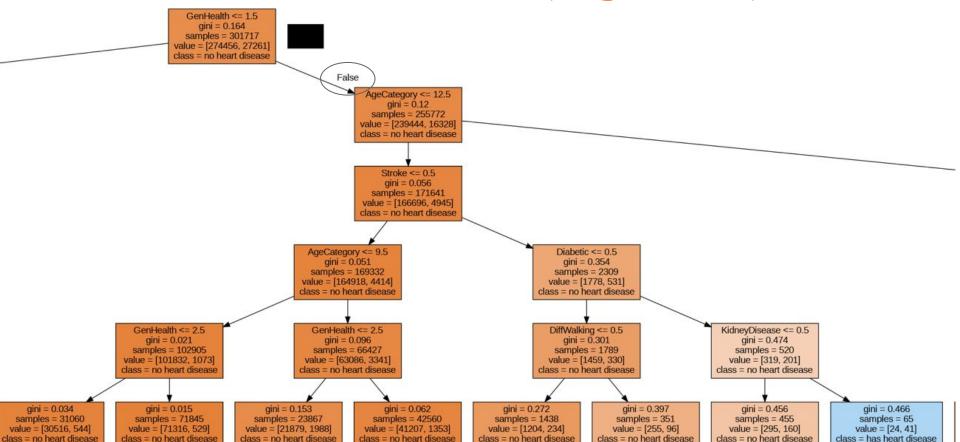
Decision Tree was 92% accurate



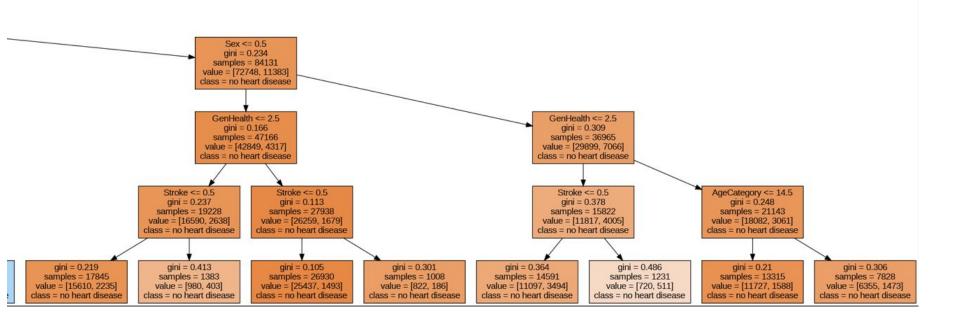
Limitations

- Missing BMI, Mental Health, Sleep
 Time, Physical Health
- Pediatrics is not listed
- Gen Health is a factor that is based off of patient opinion

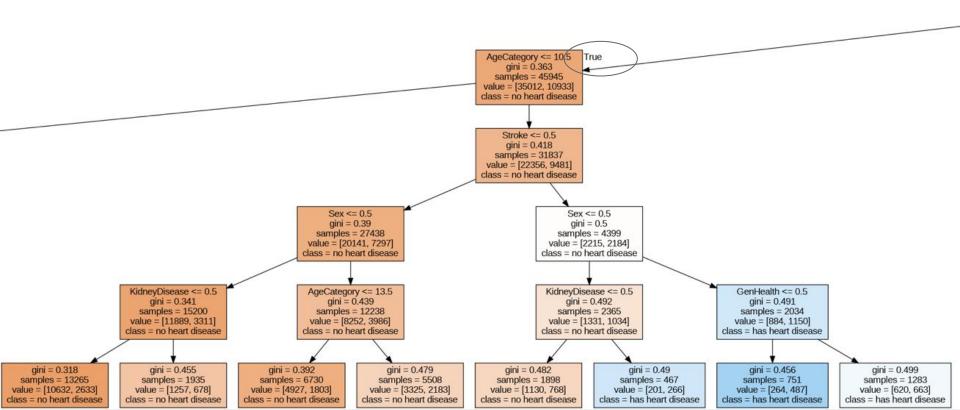
Our Decision tree (Right side)



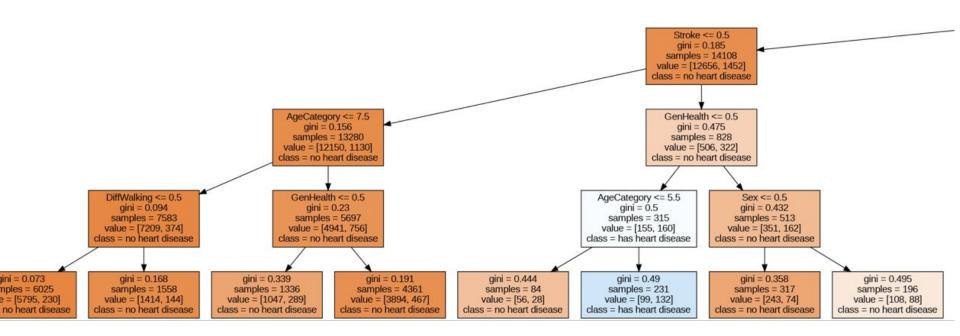
Our Decision tree (Right side)



Our Decision tree (Left side)



Our Decision tree (Left side)



Key Variables:

Along with other variables, kidney disease & stroke is the closest indicator to having heart disease.

Who our model helps CVD awareness in Hospitals

- Heart Doctors/Surgeon can use it for better patient care and to view findings that can help with case studies
- CNA's and RN's a better analysis on patient care with these findings
- Dietitians can limit patient diet that could be related to CVD

