

HEART DISEASE PREDICTION

BY ALICE CHANG

FOR IOD DATA SCIENCE & AI – P/T

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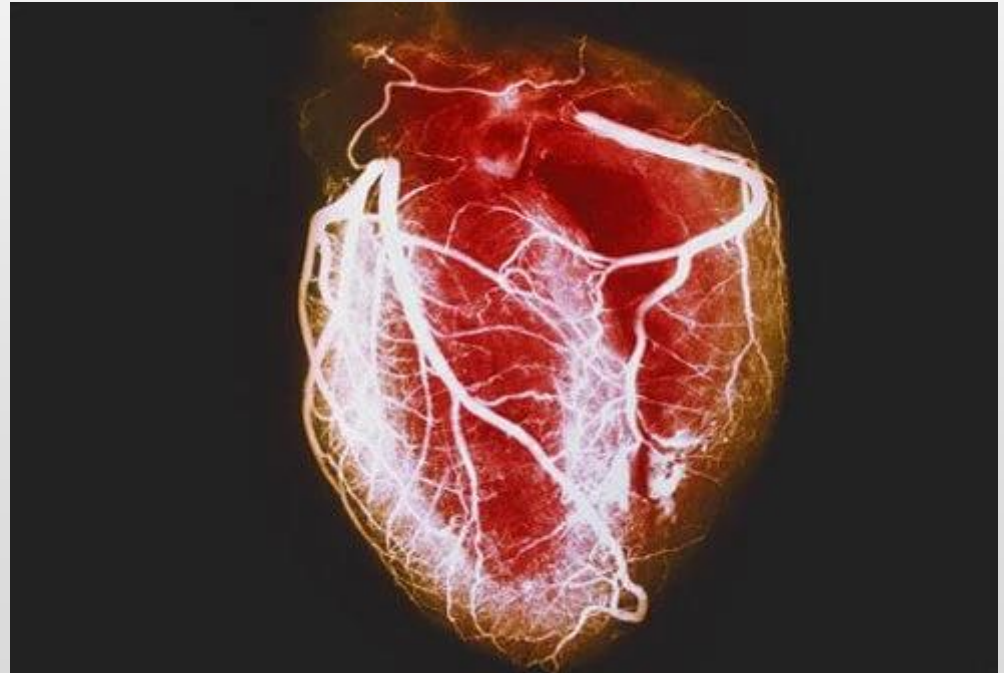
Agenda

- 1. Definition of Heart Disease**
- 2. Stakeholders**
- 3. Findings and outcome**
- 4. Verify with test scores**
- 5. Recommendations**

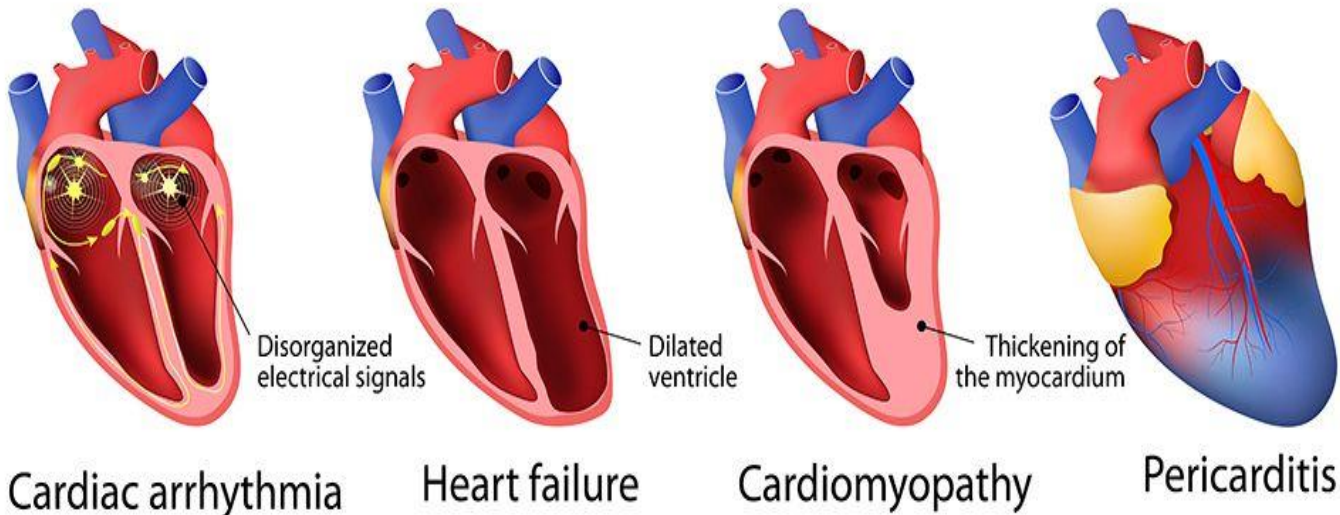
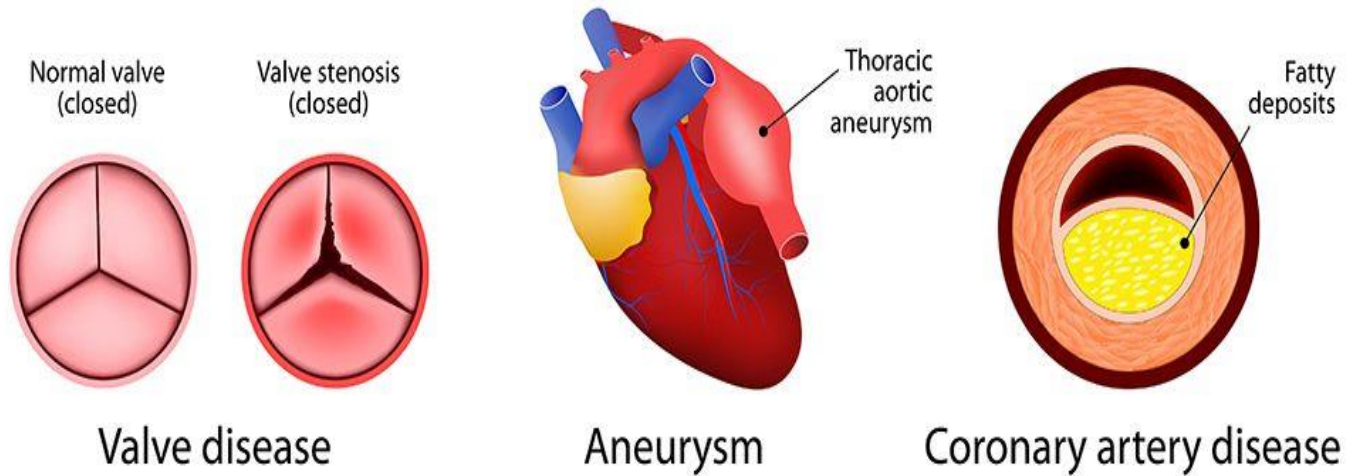
Medical Definition of Heart Disease

- Any **disorder** that **affects the heart**. Heart disease is synonymous with cardiac disease but not with cardiovascular disease which is any disease of the heart or blood vessels.

A heart muscle with blood vessels



Types of heart disease



Examples of Heart Disease

HEART ATTACK SYMPTOMS: MEN VS. WOMEN

The most common symptom of a heart attack for both men and women is chest pain. But women may experience less obvious warning signs.

MEN

Nausea or vomiting



Jaw, neck or back pain



Squeezing chest pressure or pain



Shortness of breath



WOMEN



Nausea or vomiting



Jaw, neck or **upper** back pain



Chest pain, **but not always**



Pain or pressure in the **lower chest** or **upper abdomen**



Shortness of breath



Fainting



Indigestion



Extreme fatigue

American Heart Association.



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Source: American Heart Association's journal, Circulation
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By American Heart Association News

Symptoms of Heart Disease

Stakeholders

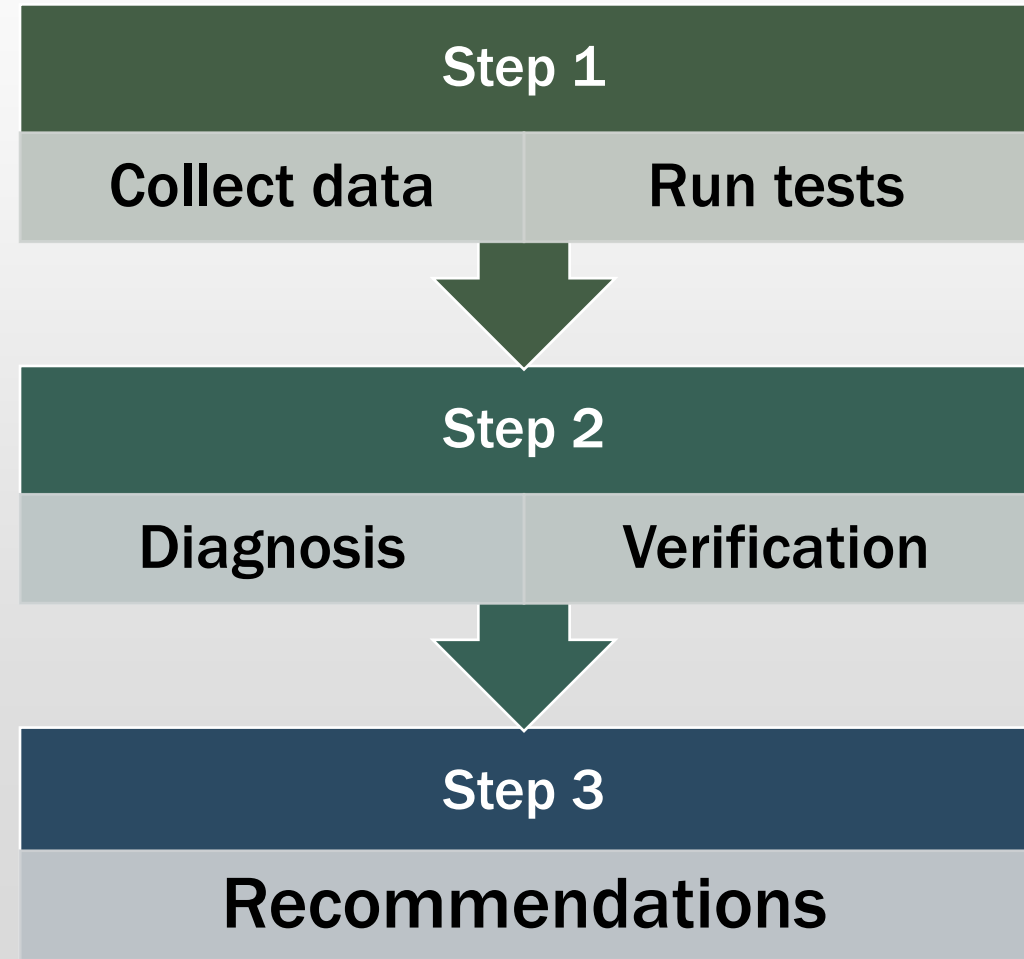
2 patients

- Profile of patient 1:

Age 54, female. With symptoms

- Profile of patient 2:

Age 65, male. No symptoms

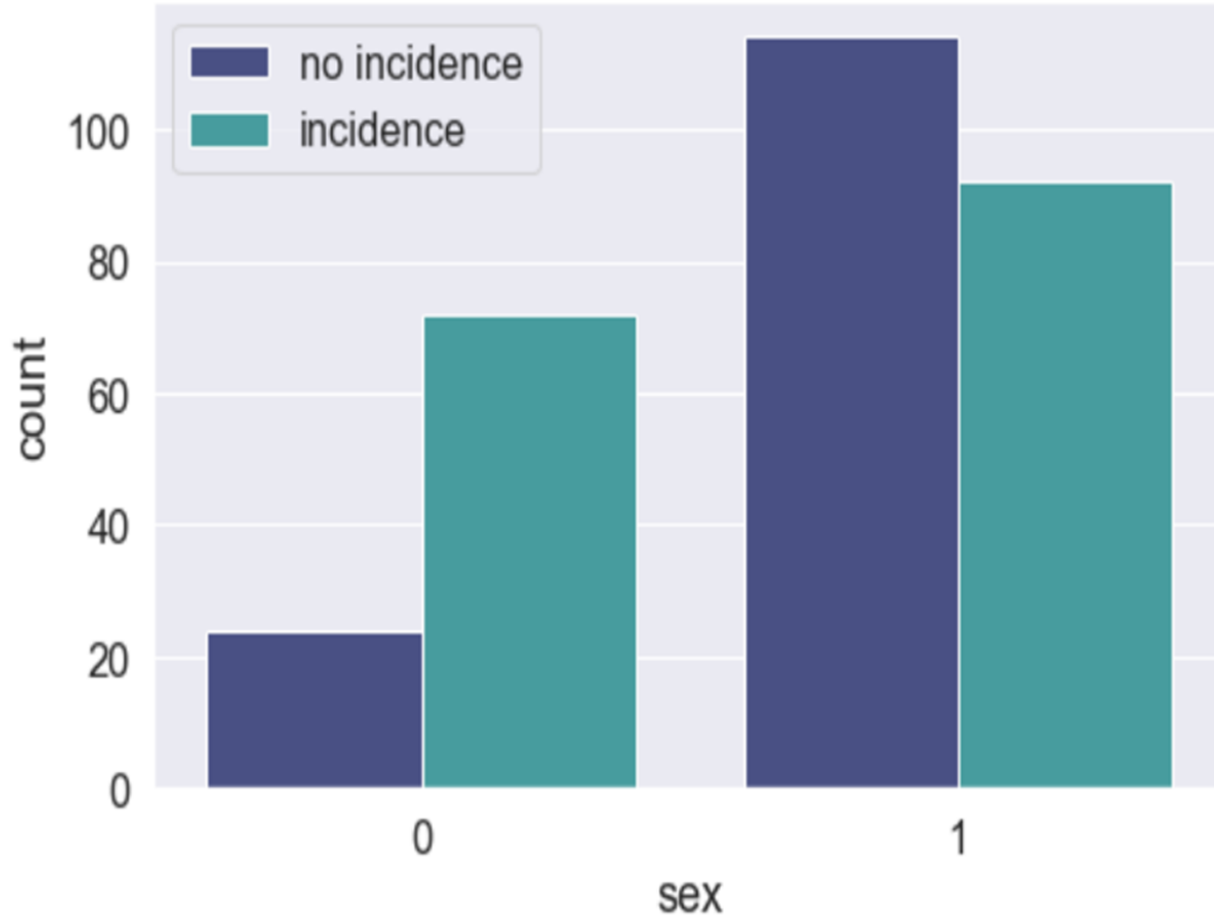


Collecting data

We collect 13 essential datas of patients. There are 4 common indicators:

Items/Descriptions	Abrv.	Values			
Chest Pain	cp	1 = typical angina	2 = atypical angina	3 = non-anginal pain	4 = asymptomatic
Heart rate	thalachh	Maximum heart rate			
Slope of heart rate during exercise	slp	1 = upsloping	2 = flat	3 = downsloping	
Electrographic measure when at rest	restecg	0 = normal	1 = having ST-T wave abnormality	2 = showing probable/ definite left ventricular hypertrophy by Estes' criteria	

Proportion of male or female with heart disease and without heart disease



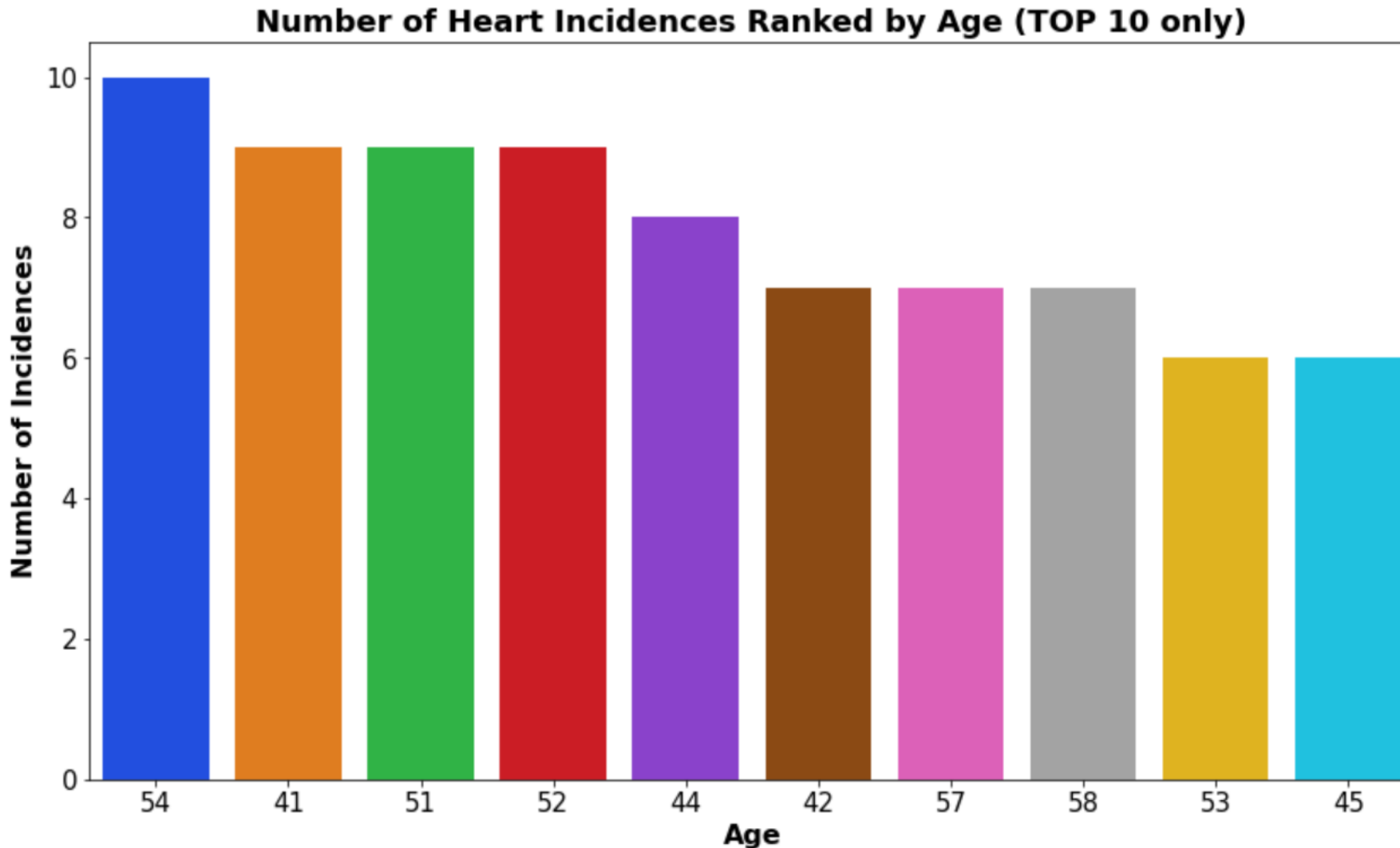
75% females (with heart disease)

vs

47% males (with heart disease)

**Females have a
higher risk for
heart disease**

Top 10 ranking in terms of Age for heart disease



Symptoms of heart disease tend to begin occurring in patients who are in their 50s and 40s.

Patient 1 who is female and 54 years old with symptoms would stand a high chance of being diagnosed with heart disease.

Patient 2 is male and age of 65 with no prior symptoms may not have heart disease.

Logistic Regression model is used to predict the diagnosis.

	Predicted (With heart disease)	Predicted (No heart disease)
Actual (heart disease)	42	0
Actual (no heart disease)	8	32

DIAGNOSIS

90% accuracy for overall prediction

Verify results with more test scores

Precision Score (84%) precision on prediction for those with actual heart disease.



Patient 1 who is female and 54 years old with symptoms has a 84% chance of having a heart disease.

Recall Score of 100% on actual condition and were predicted correctly.



Patient 2 is male and age of 65 with no prior symptoms will have a correct prediction of having no heart disease.

F1 Score of 91.3% assesses the reliability of both Precision and Recall Scores.

Recommendations

To seek 2nd medical opinions and continue to monitor their conditions.



Patient 1 who is female and 54 years old with symptoms has a 84% chance of having a heart disease.



Patient 2 is male and age of 65 with no prior symptoms will have a correct prediction of having no heart disease.

Acknowledgement

Source of data: University of California Irvine.

**End of
Presentation**