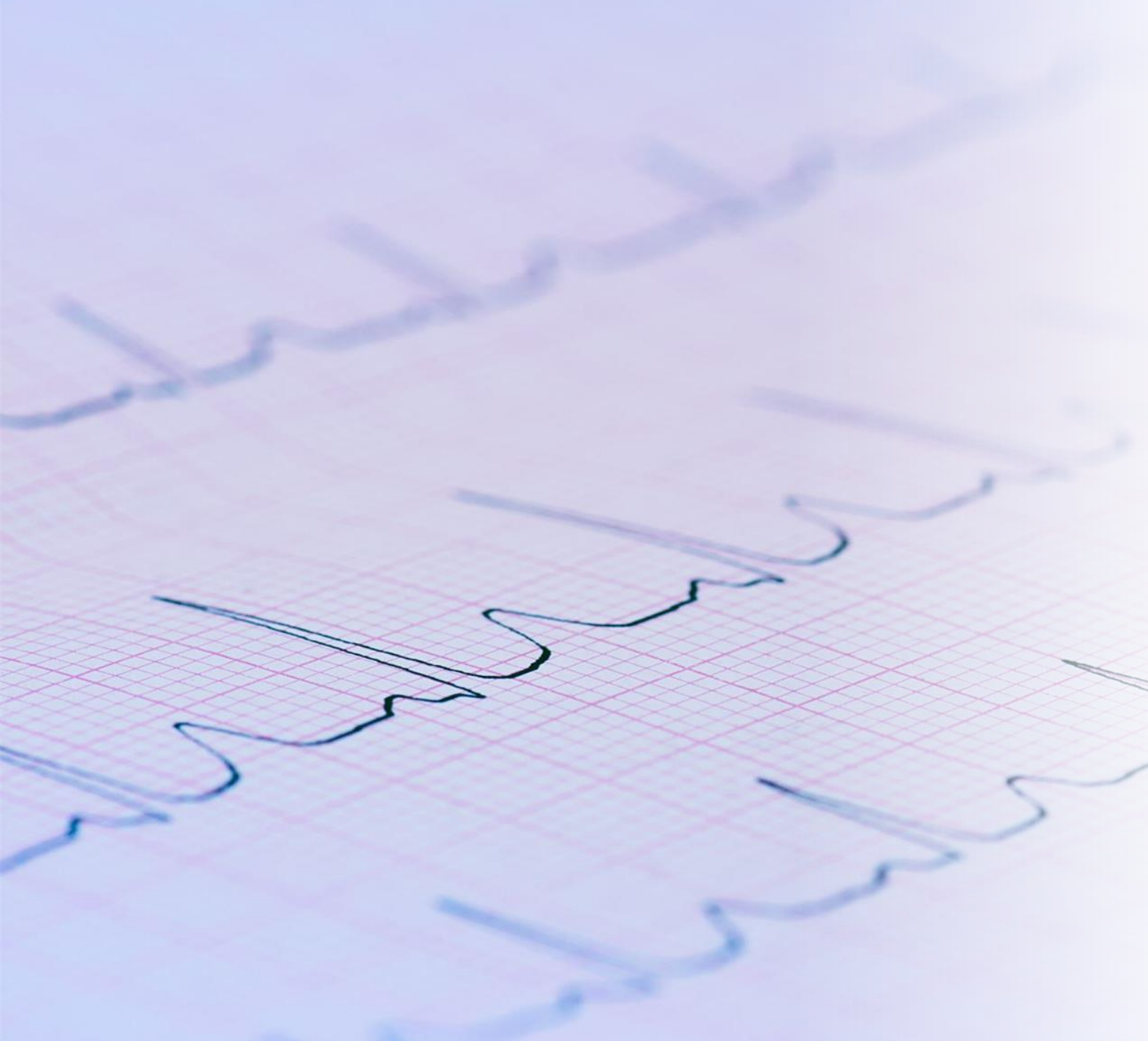


MATTERS OF HEART

Predicting survivability among cardiac patients.

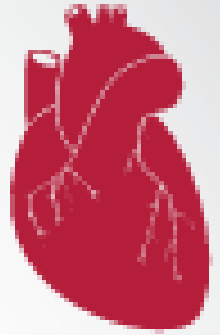
Group 5

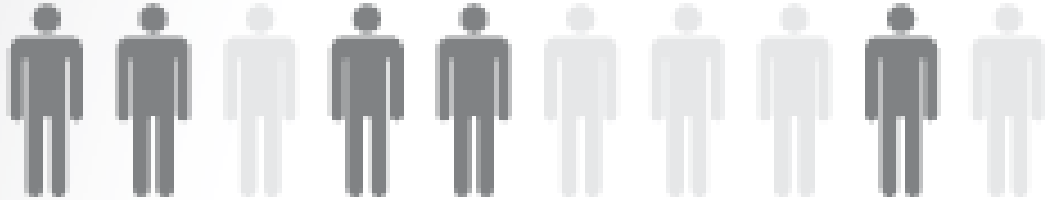
UNIVERSITY OF OTTAWA
HEART INSTITUTE

INSTITUT DE CARDIOLOGIE
DE L'UNIVERSITÉ D'OTTAWA

CANADA'S SILENT EPIDEMIC

the impact of heart failure





50% of patients diagnosed with heart failure will **die within 5 years**

40 million **people are affected** by heart failure around the world

10 billion

spent annually on **hospital costs** associated with heart failure

No. **1**

driver for unplanned **hospital admission**

Annual deaths from heart failure in Canada exceed the combined total of

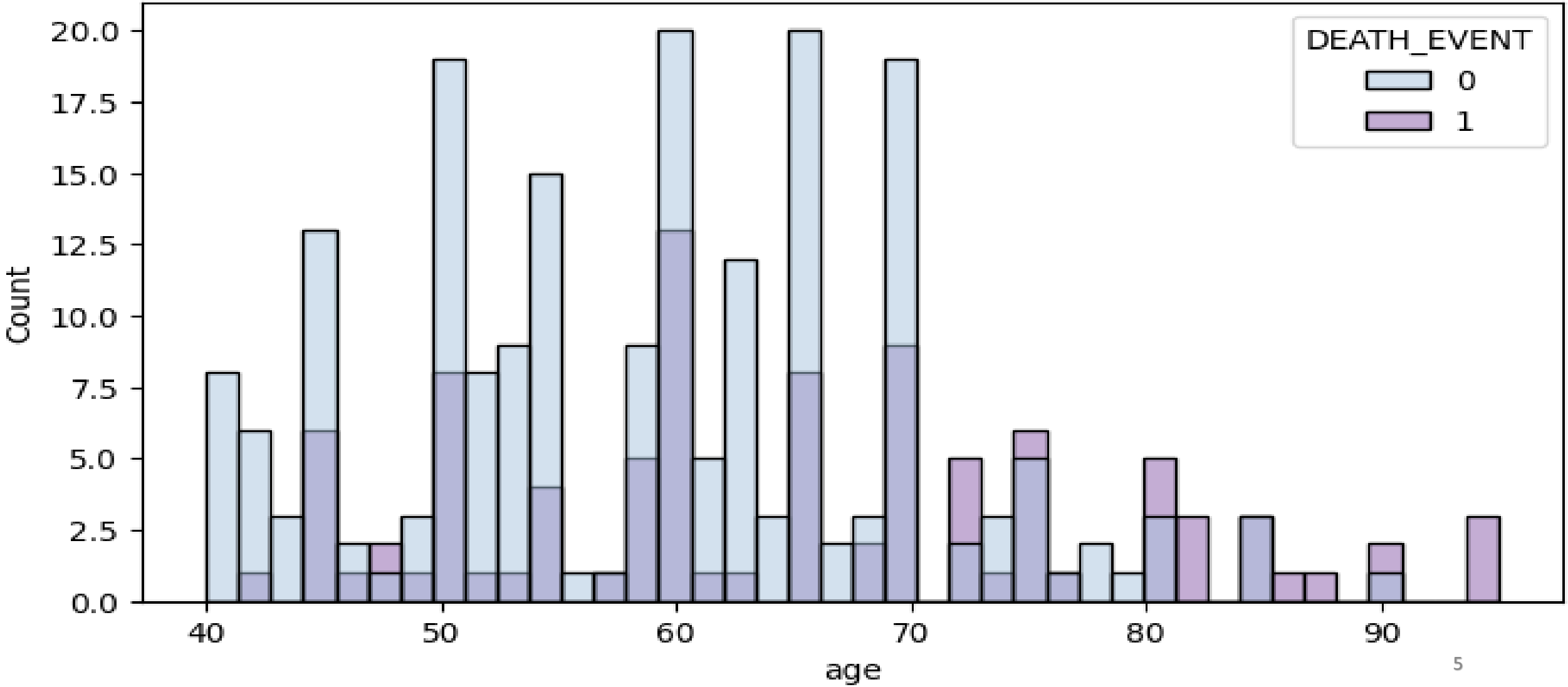
BREAST + COLON + PROSTATE CANCER

Learn the symptoms of heart failure | **www.ottawaheart.ca/heartfailure**

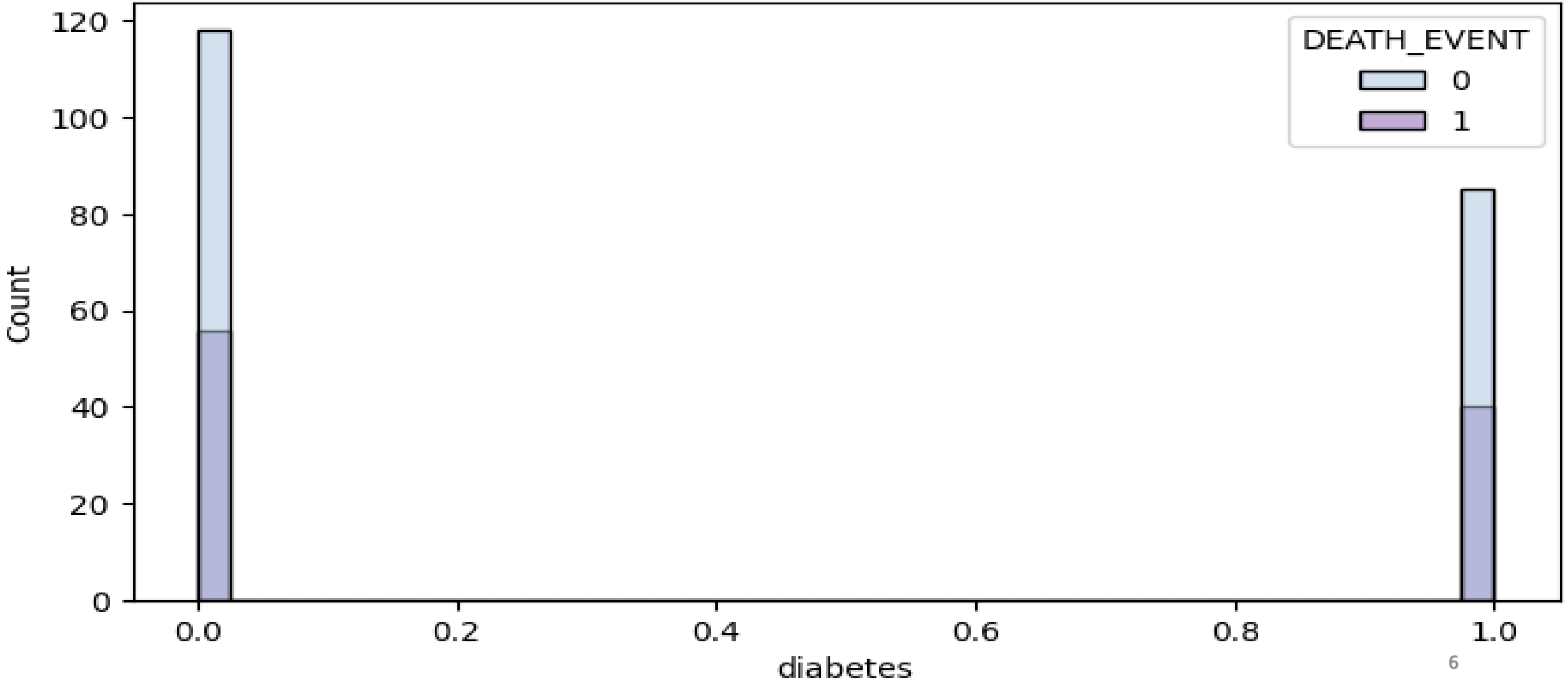
DATA

Feature	Explanation	Measurement	Range
Age	Age of the patient	Years	[40,..., 95]
Anaemia	Decrease of red blood cells or hemoglobin	Boolean	0, 1
High blood pressure	If a patient has hypertension	Boolean	0, 1
Creatinine phosphokinase (CPK)	Level of the CPK enzyme in the blood	mcg/L	[23,..., 7861]
Diabetes	If the patient has diabetes	Boolean	0, 1
Ejection fraction	Percentage of blood leaving the heart at each contraction	Percentage	[14,..., 80]
Sex	Woman or man	Binary	0, 1
Platelets	Platelets in the blood	kiloplatelets/mL	[25.01,..., 850.00]
Serum creatinine	Level of creatinine in the blood	mg/dL	[0.50,..., 9.40]
Serum sodium	Level of sodium in the blood	mEq/L	[114,..., 148]
Smoking	If the patient smokes	Boolean	0, 1
Time	Follow-up period	Days	[4,..., 285]
(target) death event	If the patient died during the follow-up period	Boolean	0, 1

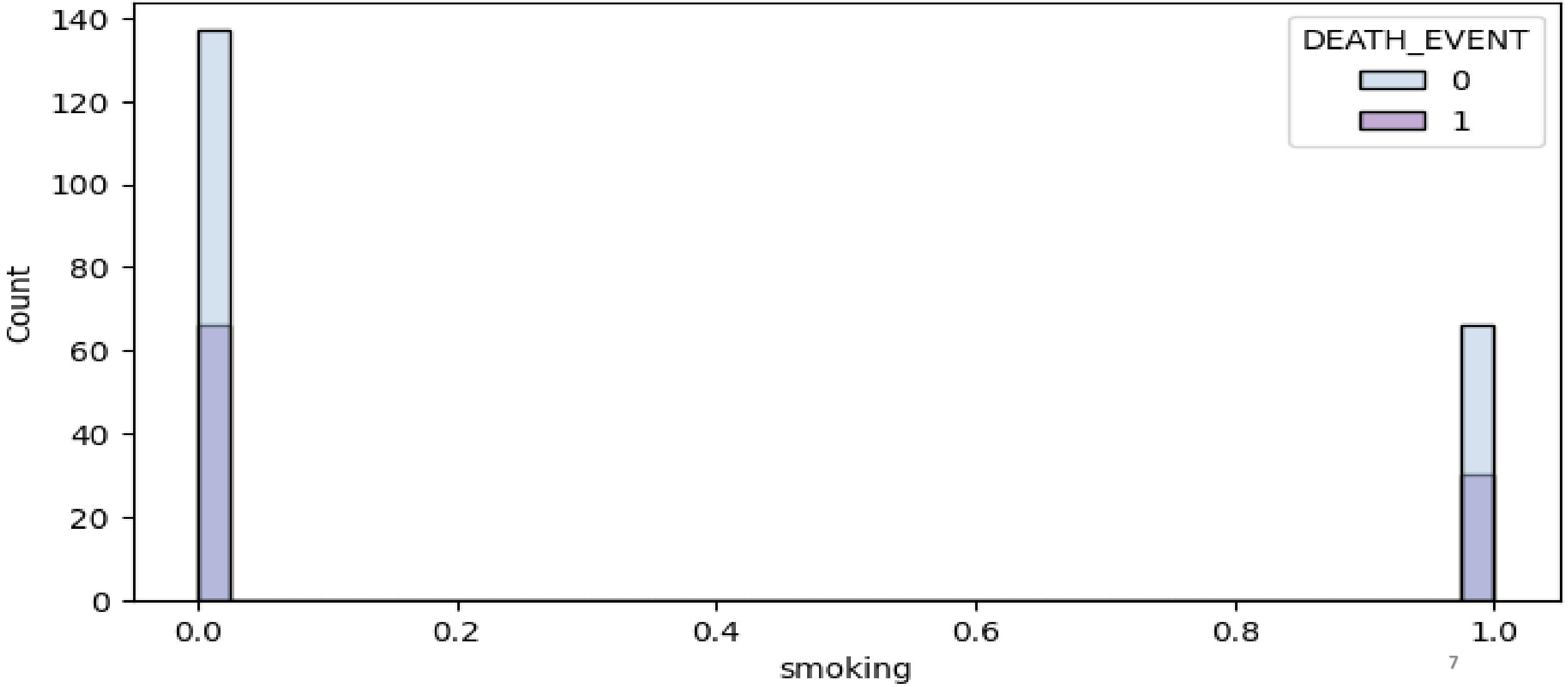
CORRELATION BETWEEN DEATH AND AGE



CORRELATION BETWEEN DEATH AND DIABETES



CORRELATION BETWEEN DEATH AND SMOKING



CLASSIFICATION MODELS FOR DEATH_EVENT

K-Nearest Neighbour	63% Accuracy
Logistic Regression Model	80% Accuracy
Random Forest Classifier	81% Accuracy

Heart Failure and Anaemia Prediction

Select Prediction Model

Predict Death Event

Predict Death Event

Age

75

Anaemia

0

Creatinine Phosphokinase (mcg/L)

582

Diabetes

0

Ejection Fraction (%)

20

High Blood Pressure

0

Platelets (platelets/mL)

265000

Serum Creatinine (mg/dL)

1.90

Serum Sodium (mEq/L)

130

Sex (0: Female, 1: Male)

1

Smoking

0

Follow-up Period (days)

4

Predict Death Event

The model predicts that the patient might have a death event during the follow-up period.

CLASSIFICATION MODELS FOR ANEMIA DETECTION

Support Vector Classifier	60% Accuracy
K-Nearest Neighbour	68% Accuracy
Random Forest Classifier	82% Accuracy

Heart Failure and Anaemia Prediction

Select Prediction Model

Predict Anaemia

Predict Anaemia

Age

75

High Blood Pressure

0

Creatinine Phosphokinase (mcg/L)

582

Diabetes

0

Ejection Fraction (%)

20

Sex (0: Female, 1: Male)

1

Platelets (platelets/mL)

265000

Serum Creatinine (mg/dL)

1.90

Serum Sodium (mEq/L)

130

Smoking

0

Follow-up Period (days)

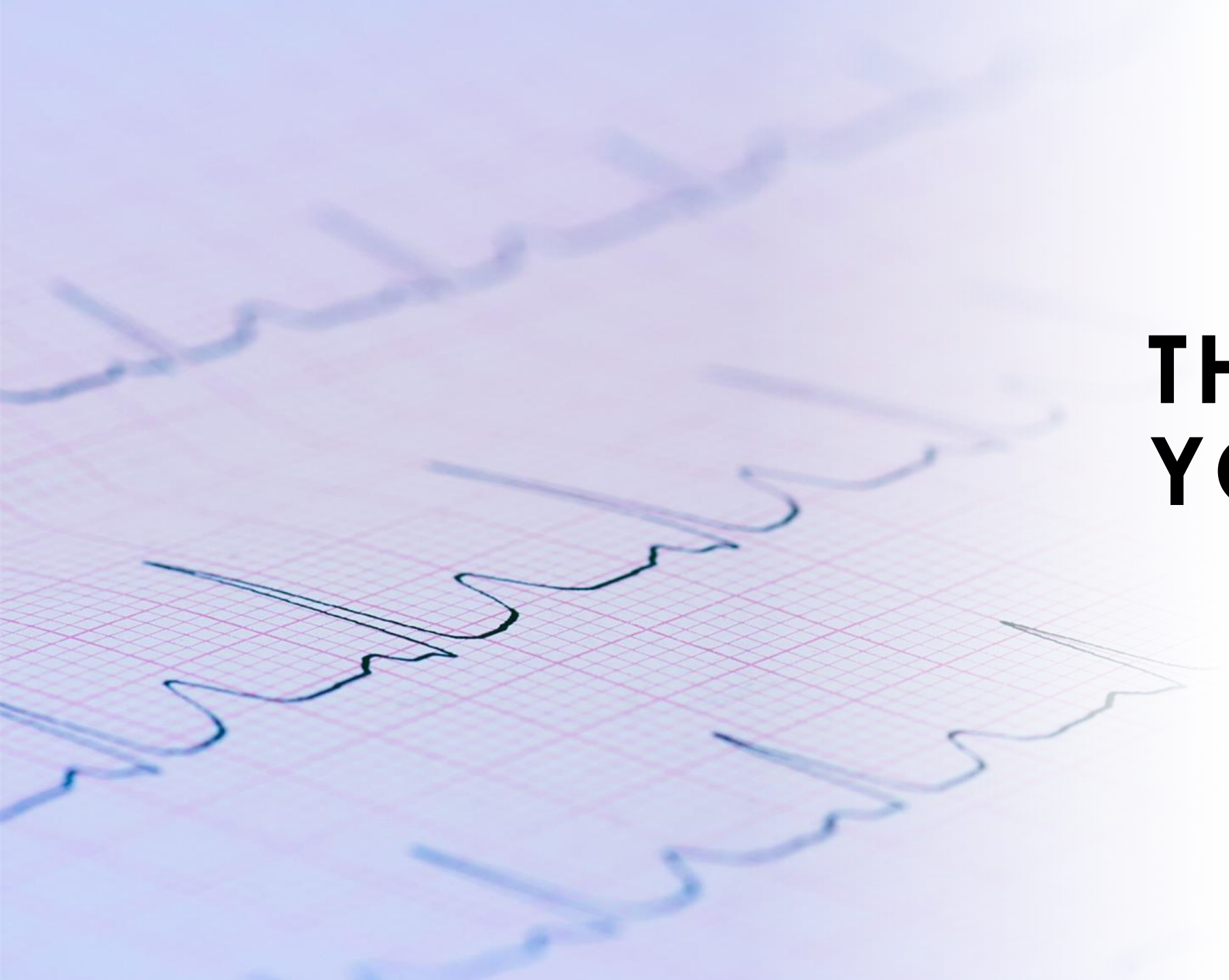
4

Death Event

1

Predict Anaemia

The model predicts that the patient is unlikely to have anaemia.



THANK YOU