# Relatório Completo de Análise Cardíaca

#### === Primeiras linhas do dataset ===

| age             | sex     | painType        | painType restingBP cholesterol |               | highBloodSugar  | restingECG | restingHR | exerciseAngina |  |
|-----------------|---------|-----------------|--------------------------------|---------------|-----------------|------------|-----------|----------------|--|
| STdep           | ression | STslope color   | redVessels                     | defectTyr     | pe heartDisease |            |           |                |  |
| 63              | male    | Typical Angina  | 145.0                          | 233.0         | True Hy         | pertrophy  | 150.0     | False          |  |
| 2.3 Downsloping |         |                 | 0.0                            | FixedDefect   | False           |            |           |                |  |
| 67              | male    | Asymptomatic    | 160.0                          | 286.0         | False Hy        | pertrophy  | 108.0     | True           |  |
|                 | 1.5     | Flat            | 3.0                            | Normal        | True            |            |           |                |  |
| 67              | male    | Asymptomatic    | 120.0                          | 229.0         | False Hy        | pertrophy  | 129.0     | True           |  |
|                 | 2.6     | Flat            | 2.0 Reve                       | ersibleDefect | True            |            |           |                |  |
| 37              | male N  | on-Anginal Pain | 130.0                          | 250.0         | False           | Normal     | 187.0     | False          |  |
|                 | 3.5 Dow | nsloping        | 0.0                            | Normal        | False           |            |           |                |  |
| 41              | female  | Atypical Angina | 130.0                          | 204.0         | False Hy        | pertrophy  | 172.0     | False          |  |
|                 | 1.4 U   | psloping        | 0.0                            | Normal        | False           |            |           |                |  |

#### === Informações do dataset ===

None

#### === Valores ausentes antes do tratamento ===

| age            | 0   |
|----------------|-----|
| sex            | 0   |
| painType       | 0   |
| restingBP      | 60  |
| cholesterol    | 202 |
| highBloodSugar | 90  |
| restingECG     | 2   |
| restingHR      | 55  |
| exerciseAngina | 55  |
| STdepression   | 62  |
| STslope        | 309 |
| coloredVessels | 611 |
| defectType     | 486 |
| heartDisease   | 0   |

### === Valores ausentes após tratamento ===

| age            | 0 |
|----------------|---|
| sex            | 0 |
| painType       | 0 |
| restingBP      | 0 |
| cholesterol    | 0 |
| highBloodSugar | 0 |
| restingECG     | 0 |
| restingHR      | 0 |
| exerciseAngina | 0 |
| STdepression   | 0 |
| STslope        | 0 |
| coloredVessels | 0 |

defectType 0 heartDisease 0

### === Métricas de Desempenho ===

Acurácia: 0.7935 Precisão: 0.8243 Recall: 0.7974 F1-Score: 0.8106

#### Matriz de Confusão:

[[ 97 26] [ 31 122]]

### Relatório de Classificação:

|              | precision | recall | f1-score | support |
|--------------|-----------|--------|----------|---------|
|              |           |        |          |         |
| 0            | 0.76      | 0.79   | 0.77     | 123     |
| 1            | 0.82      | 0.80   | 0.81     | 153     |
|              |           |        |          |         |
| accuracy     |           |        | 0.79     | 276     |
| macro avg    | 0.79      | 0.79   | 0.79     | 276     |
| weighted avg | 0.79      | 0.79   | 0.79     | 276     |

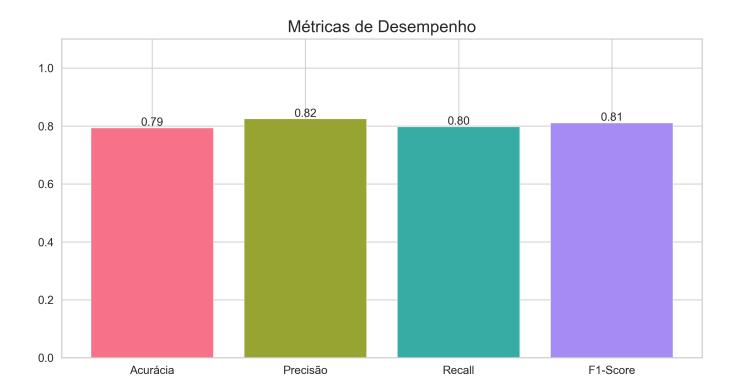
### === Validação Cruzada ===

Acurácias: [0.8043 0.7609 0.75 0.8152 0.7446]

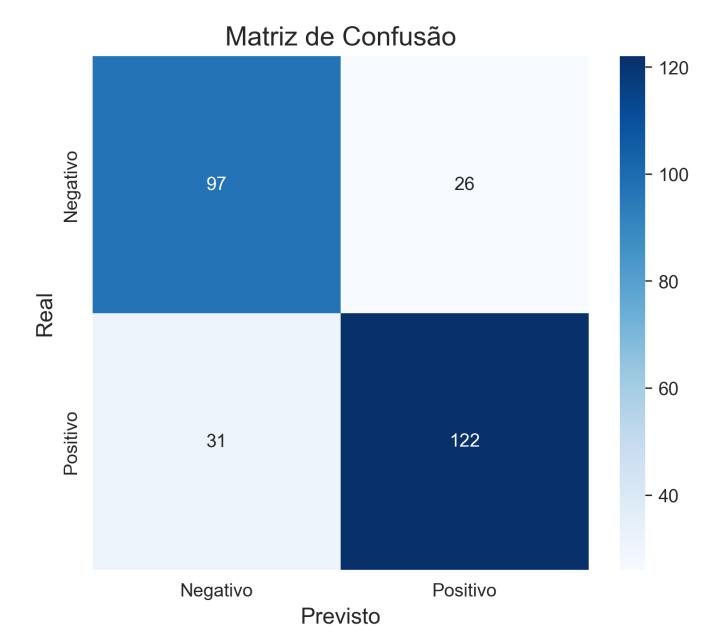
Média: 0.7750

Desvio padrão: 0.0291

## **Metrics**



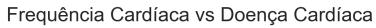
## **Confusion Matrix**

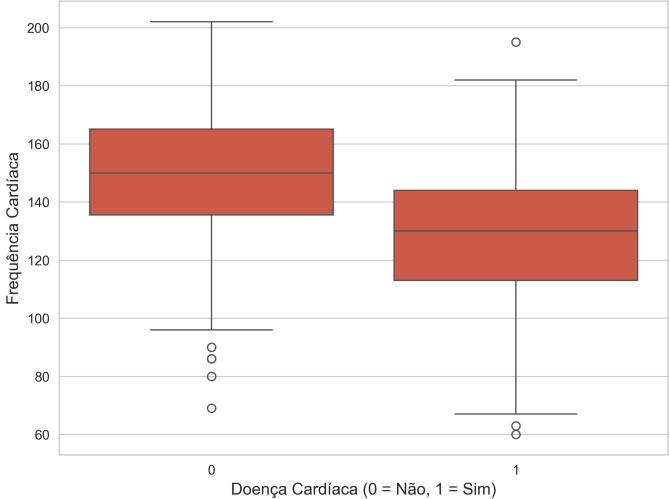


## **Correlation Matrix**

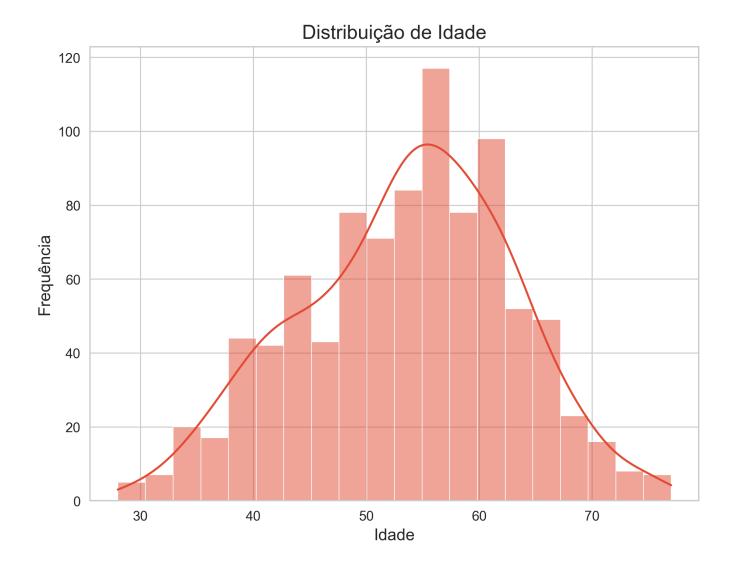
| Matriz de Correlação de Pearson |       |       |          |           |             |                |            |           |                |              | 1.0     |                |            |              |       |       |
|---------------------------------|-------|-------|----------|-----------|-------------|----------------|------------|-----------|----------------|--------------|---------|----------------|------------|--------------|-------|-------|
| age                             | 1.00  | -0.02 | 0.17     | 0.24      | 0.07        | 0.22           | 0.21       | -0.35     | 0.16           | 0.23         | 0.08    | 0.22           | 0.14       | 0.28         |       | 1.0   |
| sex                             | -0.02 | 1.00  | 0.05     | 0.04      | 0.06        | -0.02          | -0.35      | -0.24     | -0.01          | -0.14        | 0.24    | -0.42          | -0.40      | -0.00        |       | . 0 0 |
| painType                        | 0.17  | 0.05  | 1.00     | 0.02      | 0.08        | 0.02           | 0.02       | -0.34     | 0.40           | 0.24         | 0.11    | 0.08           | 0.19       | 0.47         | - 0.8 |       |
| restingBP                       | 0.24  | 0.04  | 0.02     | 1.00      | 0.08        | 0.14           | 0.09       | -0.10     | 0.15           | 0.17         | 0.05    | 0.04           | 0.08       | 0.11         |       | 0.6   |
| cholesterol                     | 0.07  | 0.06  | 0.08     | 0.08      | 1.00        | 0.05           | 0.08       | -0.02     | 0.07           | 0.05         | 0.00    | 0.07           | -0.00      | 0.09         | 0.0   |       |
| highBloodSugar                  | 0.22  | -0.02 | 0.02     | 0.14      | 0.05        | 1.00           | 0.14       | -0.03     | -0.00          | 0.03         | 0.07    | 0.06           | 0.05       | 0.11         | - 0.4 |       |
| restingECG                      | 0.21  | -0.35 | 0.02     | 0.09      | 0.08        | 0.14           | 1.00       | 0.10      | 0.01           | 0.12         | -0.08   | 0.31           | 0.18       | 0.04         |       |       |
| restingHR                       | -0.35 | -0.24 | -0.34    | -0.10     | -0.02       | -0.03          | 0.10       | 1.00      | -0.35          | -0.15        | -0.29   | 0.04           | -0.10      | -0.38        | _     | 0.2   |
| exerciseAngina                  | 0.16  | -0.01 | 0.40     | 0.15      | 0.07        | -0.00          | 0.01       | -0.35     | 1.00           | 0.40         | 0.19    | 0.04           | 0.21       | 0.43         | 3.2   |       |
| STdepression                    | 0.23  | -0.14 | 0.24     | 0.17      | 0.05        | 0.03           | 0.12       | -0.15     | 0.40           | 1.00         | 0.26    | 0.22           | 0.17       | 0.37         | _     | 0.0   |
| STslope                         | 0.08  | 0.24  | 0.11     | 0.05      | 0.00        | 0.07           | -0.08      | -0.29     | 0.19           | 0.26         | 1.00    | -0.10          | 0.01       | 0.21         |       |       |
| coloredVessels                  | 0.22  | -0.42 | 0.08     | 0.04      | 0.07        | 0.06           | 0.31       | 0.04      | 0.04           | 0.22         | -0.10   | 1.00           | 0.29       | 0.16         | _     | -0.2  |
| defectType                      | 0.14  | -0.40 | 0.19     | 0.08      | -0.00       | 0.05           | 0.18       | -0.10     | 0.21           | 0.17         | 0.01    | 0.29           | 1.00       | 0.28         |       |       |
| heartDisease                    | 0.28  | -0.00 | 0.47     | 0.11      | 0.09        | 0.11           | 0.04       | -0.38     | 0.43           | 0.37         | 0.21    | 0.16           | 0.28       | 1.00         | _     | -0.4  |
|                                 | age   | sex   | painType | restingBP | cholesterol | highBloodSugar | restingECG | restingHR | exerciseAngina | STdepression | STslope | coloredVessels | defectType | heartDisease |       |       |

## **Heart Rate**



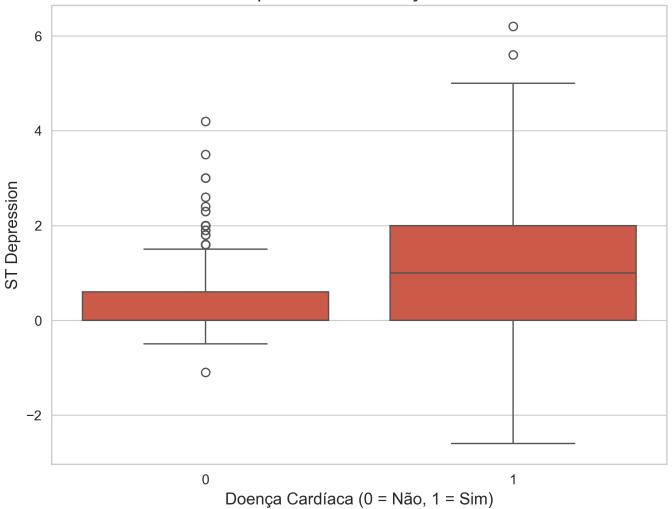


# **Age Distribution**

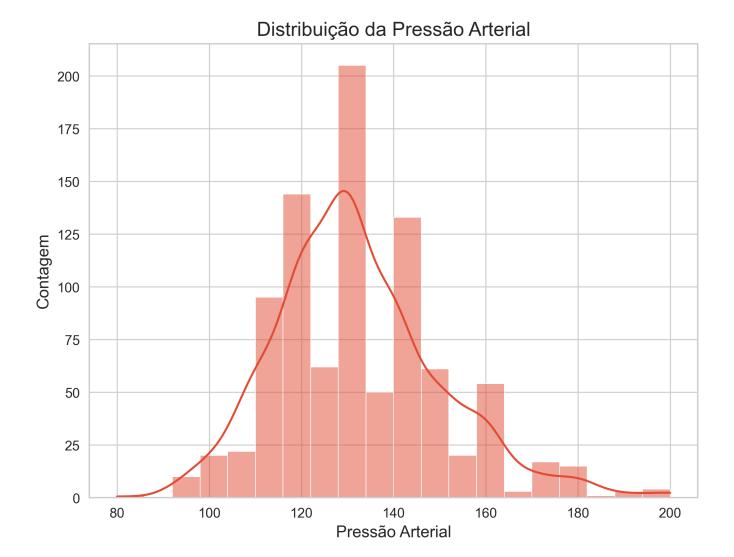


# St Depression

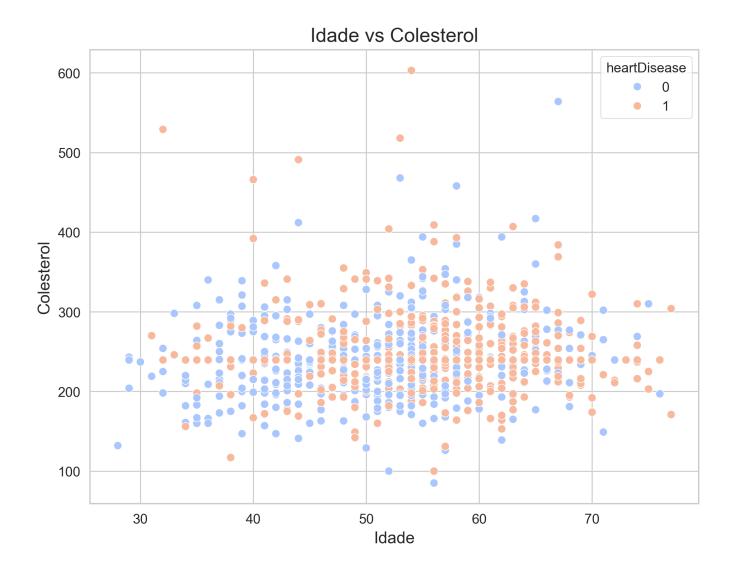




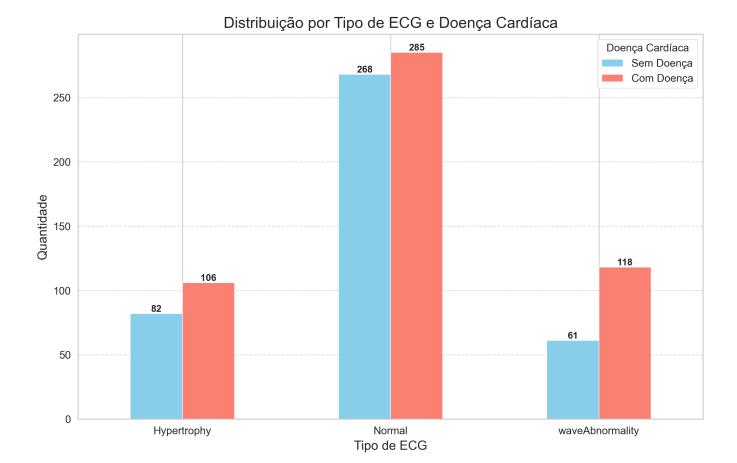
## **Blood Pressure**



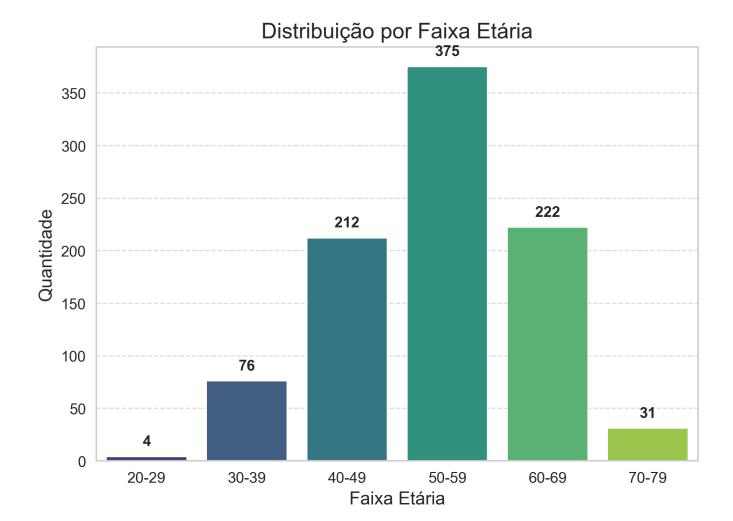
# **Age Cholesterol**



# **Resting Ecg Disease**



## **Age Distribution Count**



# **Age Disease Distribution**

