

# The Gender-Specific Effects of Statin Use

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## Background

- Male-focused clinical studies leave gaps in women's outcomes.
- Statins offer a chance to study gender-specific responses.
- Former research found statins affect men and women differently, but results vary.



## Statins

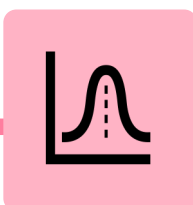
- Male-focused clinical studies leave gaps in women's outcomes.
- Statins offer a chance to study gender-specific responses.

## Process

Feature Selection



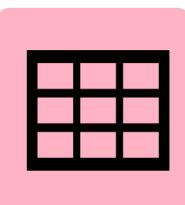
Statistical Analysis



Model Evaluation



Data Preprocessing



Model Selection



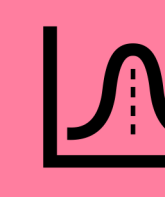
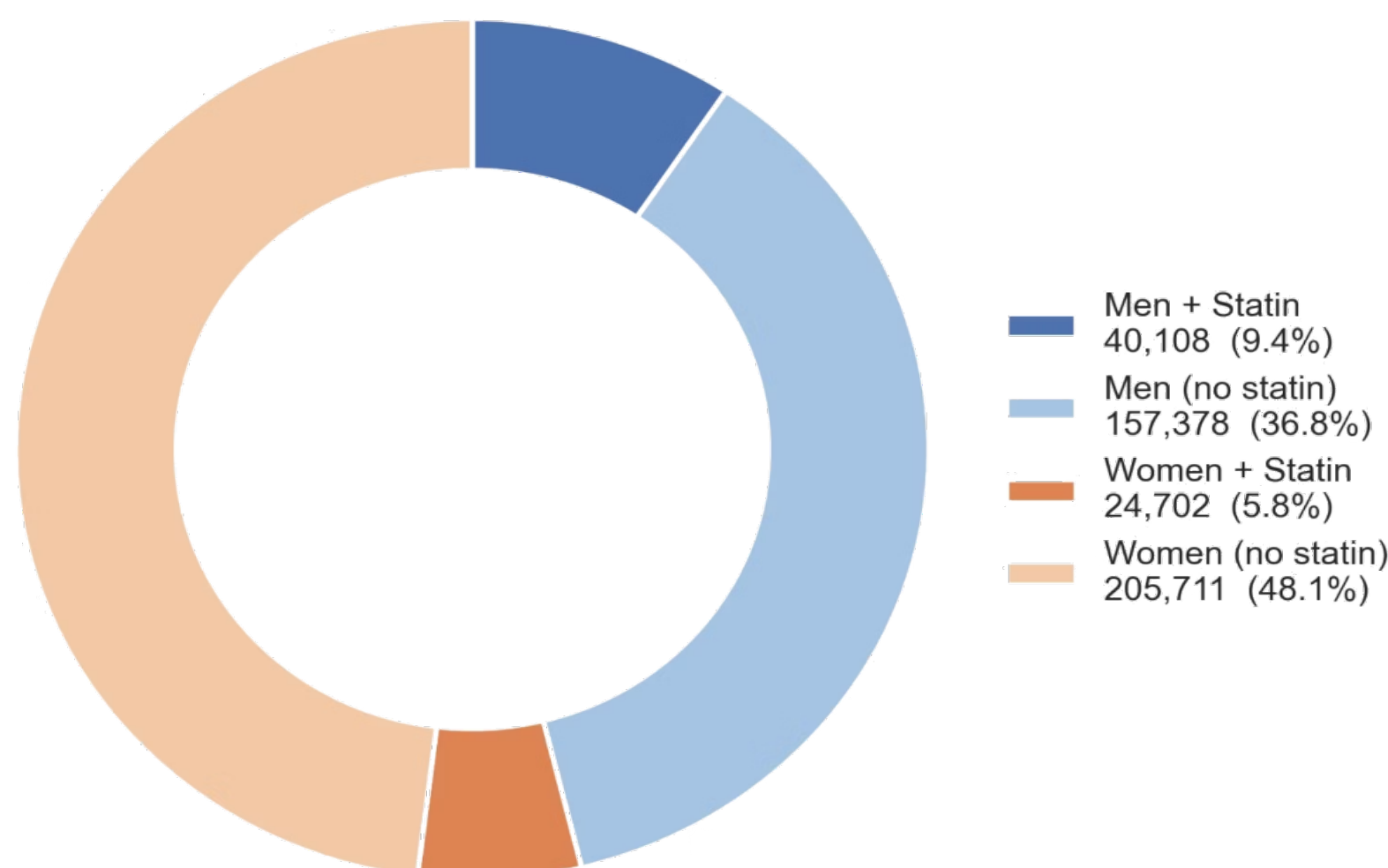
Conclusions



## Data & Features

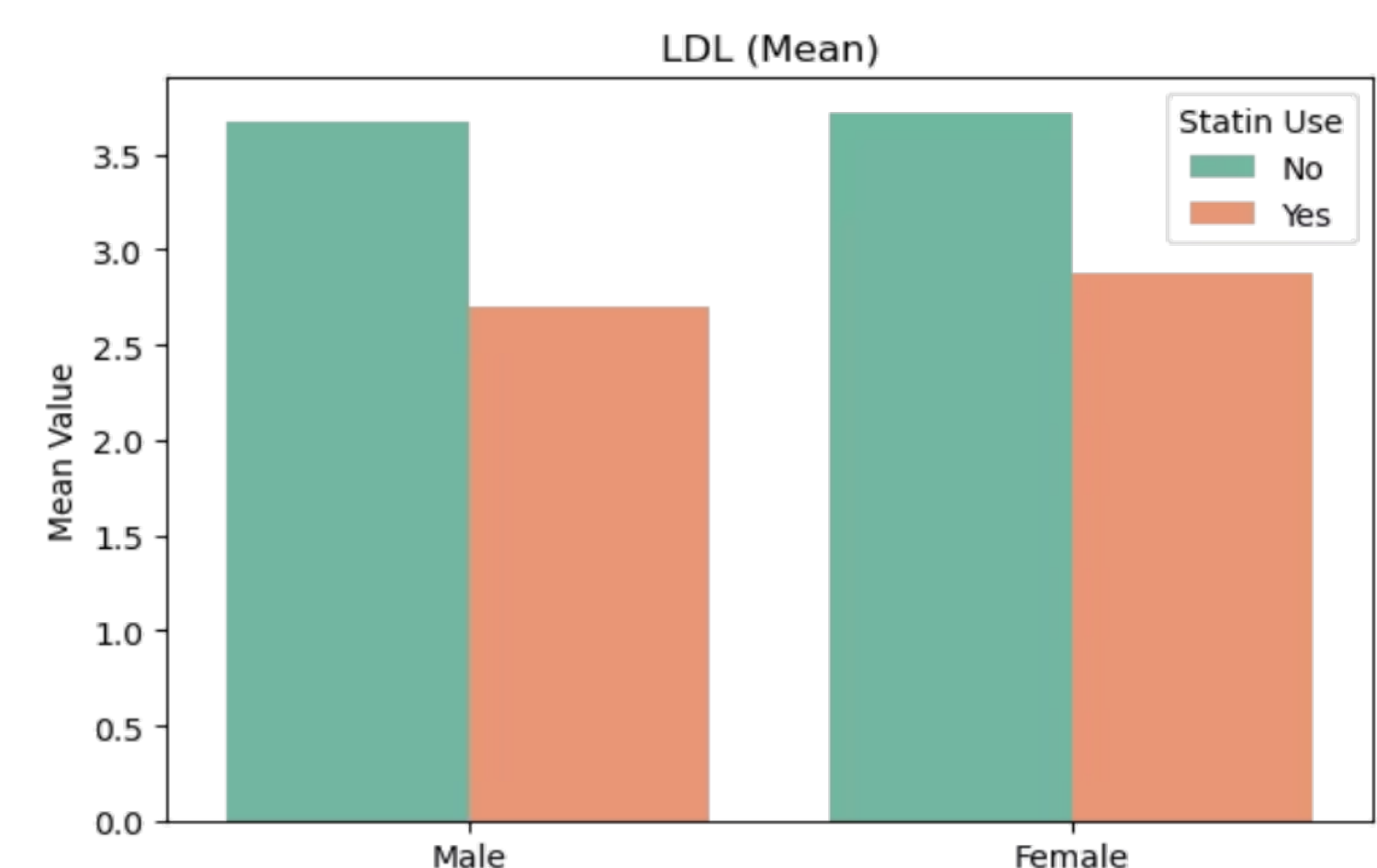
**UK Biobank** (~430,000 people, age 37+).

- Demographics:** age, gender.
- Lifestyle:** smoking, BMI.
- Clinical:** blood pressure, diabetes.
- Lipids:** LDL, HDL, triglycerides.
- Other:** liver tests, CRP, statin use.



## Statistical Analysis

- T-tests:** on LDL, HDL, triglycerides, CRP.
- Hypotheses:**
  - null - no effect.
  - alternative - statins change values.
- Found gender-specific effects**
  - LDL drop larger in men than in women.



## Model Selection & Evaluation

- Model:** linear regression, model for each target.
- Data Split:** men, women, younger ( $\leq 50$ ), older ( $\geq 60$ ).
- Evaluation:** compared the statin-use coefficient.
- Found gender-specific effects of Statin use:**
  - LDL drop is larger in men.
  - Women get less anti-inflammation benefit.
  - HDL may improve more in women.

Sex	Age Band	$\beta$ (statin)
Men	$\leq 50$	-0.694
Women	$\leq 50$	-0.898
Men	$\geq 60$	-1.216
Women	$\geq 60$	-1.076



## Conclusions

- Good medicine needs to understand how drugs work **differently in everyone**.
- our research shows **we still have work to do** order to figure out these differences between men and women.