The Gender-Specific Effects of Statin Use

Danielle Shany | Ron Raviv

Mentors:
Dr. Dorit Shweiki
Dr. Yonatan Bilu
Prof. Adi Shraibman
Prof. Gidon Dror

Background

Male-focused clinical studies leave gaps in women's outcomes.
Former research found statins affect men and women differently, but results vary.

Statins:
Common cholesterol-lowering medicine.
Mainly used to reduce LDL ("bad cholesterol").

Good medicine needs to understand how drugs work **differently in everyone.**

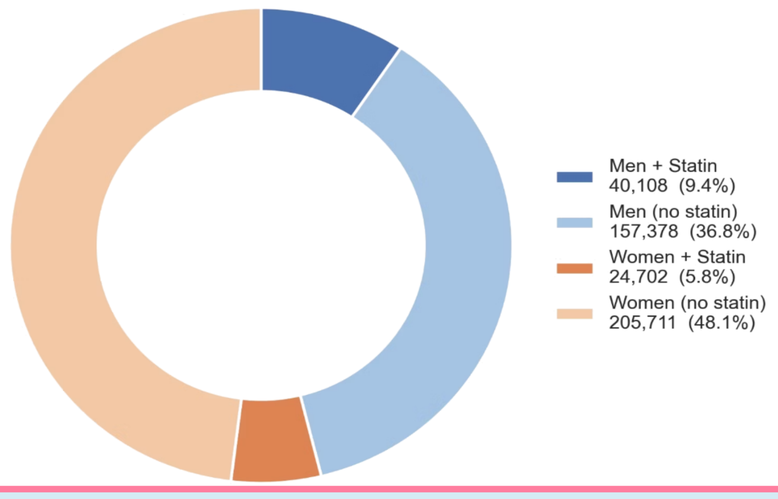
our research shows **we still have work to do** to figure out these differences between men and women.

Process

Feature Selection → **Data Preprocessing** → **Statistical Analysis** → **Model Selection** → **Model Evaluation** → **Conclusions**

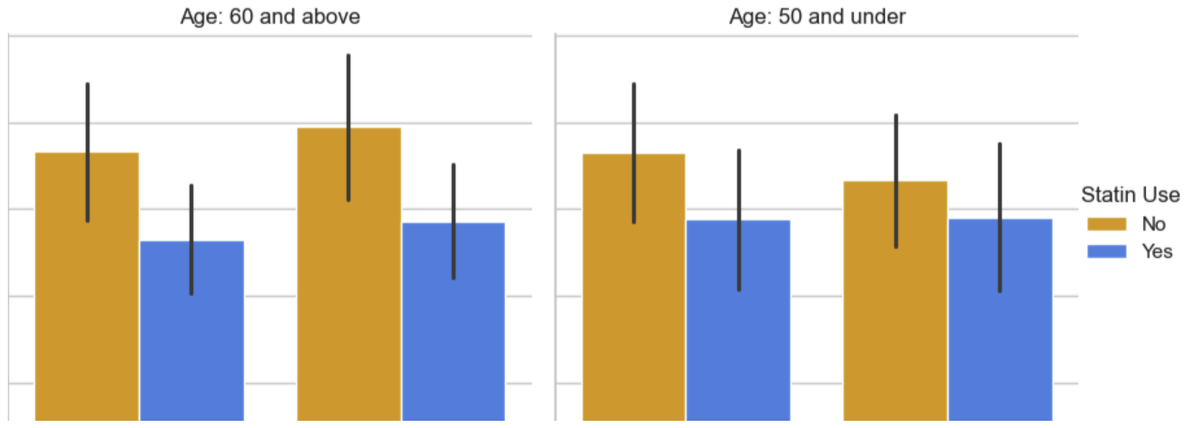
Data & Features

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.



Age Group	Gender	Mean LDL (No Statins)	Mean LDL (Statins)	LDL Decrease	Relative LDL Decrease
50 and under	Female	3.33	2.90	0.43	12.87
50 and under	Male	3.65	2.88	0.77	21.12
60 and above	Female	3.95	2.86	1.09	27.56
60 and above	Male	3.66	2.65	1.01	27.62

Model Selection & Evaluation

Model: linear regression, model for each target.
Data Split: men, women, younger (≤50), older (≥60).
Evaluation: compared the statin-use coefficient.

Sex	Age Band	β (statin)
Men	<= 50	-0.694
Women	<= 50	-0.898
Men	>= 60	-1.216
Women	>= 60	-1.076

Conclusions

1. LDL drop
   less in young women
   similar in older adults
2. Older women have higher LDL and use
   possible under-treatment
3. Weaker anti-inflammatory effect in wo
4. Stronger HDL response in women