

# Using Healthcare Claims Data and Machine Learning to Identify Health Disparities for Individuals with Diagnosed and Undiagnosed Familial Hypercholesterolemia.

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## Background

Individuals with Familial Hypercholesterolemia (FH) warrant intensive lipid lowering therapy to achieve guideline-recommended LDL-C treatment targets. Treatment typically starts with statins and progresses by adding ezetimibe and PCSK9 inhibitors (PCSK9i) as needed.

We previously identified disparities in the use of statins for US FH patients. However, little data are available on whether disparities exist in the use of ezetimibe, PCSK9i, and the combination of statins + ezetimibe + PCSK9i in this population.

## Methods and Material

The Family Heart Database™ is comprised of diagnostic/procedural/prescription data from claims and/or laboratory data for >300 million individuals from the US. The dataset used in this analysis included >77 million individuals with prescription data.

“Diagnosed FH” patients were identified by ICD-10 diagnosis code (E.78.01); undiagnosed FH patients (“Probable FH”) were identified by the Family Heart Foundation’s validated FIND FH® machine learning model.

An analysis of *filled* prescriptions for statins, ezetimibe, and PCSK9i was completed. Data were analyzed in multivariable models including age, education, income, race/ethnicity, and gender.

# Guideline-recommended lipid lowering therapy is more often prescribed for individuals with FH who are White, have high income, or have advanced education.

Odds Ratio (95% Confidence Interval) of Receiving Lipid-Lowering Therapy						
	Diagnosed FH Patients (n=280,426)			Probable FH Patients (n=899,027)		
	Ezetimibe	PCSK9i	Statin + ezetimibe + PCSK9i	Ezetimibe	PCSK9i	Statin + ezetimibe + PCSK9i
<b>Age per year</b>	0.99 (0.99-0.99)	0.97 (0.97-0.97)	0.96 (0.96-0.96)	1.00 (1.00-1.00)	1.01 (1.01-1.01)	0.99 (0.99-0.99)
<b>Education (compared with high school or less)</b>						
<b>Some college</b>	1.08 (1.04-1.12)	1.06 (0.99-1.11)	1.15 (1.04-1.27)	0.98 (0.96-1.00)	0.96 (0.93-0.99)	0.99 (0.93-1.05)
<b>≥Associates degree</b>	1.20 (1.15-1.26)	1.22 (1.13-1.31)	1.51 (1.34-1.70)	1.07 (1.04-1.10)	0.99 (0.96-1.03)	1.15 (1.07-1.24)
<b>Household Income (compared with &lt;\$49K)</b>						
<b>\$50-99K</b>	1.13 (1.09-1.28)	1.26 (1.18-1.34)	1.18 (1.06-1.32)	1.18 (1.15-1.20)	1.22 (1.18-1.26)	1.20 (1.12-1.28)
<b>≥\$100K</b>	1.30 (1.24-1.36)	1.50 (1.40-1.62)	1.40 (1.24-1.57)	1.36 (1.32-1.39)	1.43 (1.38-1.48)	1.47 (1.36-1.58)
<b>Ethnicity/Race (compared with Black)</b>						
<b>White</b>	1.20 (1.14-1.26)	1.28 (1.18-1.39)	1.20 (1.05-1.38)	1.06 (1.03-1.09)	1.30 (1.25-1.35)	1.06 (0.98-1.15)
<b>Hispanic</b>	0.96 (0.90-1.03)	1.01 (0.99-1.13)	0.96 (0.79-1.16)	0.86 (0.83-0.90)	0.92 (0.87-0.98)	0.86 (0.76-0.97)
<b>Gender (compared with female)</b>						
<b>Male</b>	0.80 (0.78-0.83)	0.67 (0.64-0.70)	0.74 (0.68-0.80)	0.97 (0.95-0.98)	1.02 (0.99-1.04)	1.03 (0.98-1.09)

## Results

The Family Heart Dataset included individuals with:

- **Diagnosed FH**, n=280,426 (51% female; 79.5% White, 11.8% Black, and 8.7% Hispanic)
- **Probable FH**, n=899,027 (48% female; 78.7% White, 12.9% Black, and 8.5% Hispanic)

Within both Diagnosed and Probable FH groups:

- Males compared with females were 46-48% more likely to receive high intensity statins.
- Individuals with household income ≥\$100K compared with <\$49K were 30-50% more likely to receive ezetimibe, PCSK9i, or the combination of statin + ezetimibe + PCSK9i (Table).
- Whites compared with Blacks were 6-30% more likely to receive ezetimibe, PCSK9i, or statin + ezetimibe + PCSK9i (Table).

Diagnosed FH patients with a college degree compared with high school or less were 51% more likely to receive statin + ezetimibe + PCSK9i (Table).

## Conclusion

Real world patterns of medical care reveal guideline-recommended lipid lowering therapy is more often prescribed for individuals with FH who are White, have high income, or have advanced education.

Efforts are warranted to improve equity and provide all individuals with FH an opportunity for cardiovascular risk reduction.