



HERA - Large-scale characterization of health equity

Noemie Elhadad PhD
Columbia University



Health equity

*“Health equity means that everyone has a **fair** and **just** **opportunity** to be as healthy as possible.” (RWJF; 2017 report)*



<https://www.nastad.org/domestic/health-equity>



Health disparities

“Race/ethnicity, sex, sexual identity, age, disability, socioeconomic status, and geographic location all contribute to an individual's ability to achieve good health.” (Healthy People 2020)

- Health disparities are multi-factorial
- Intersectionality plays a role

Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of health and social behavior*, Spec No, 80–94.

Galea, S., Tracy, M., Hoggatt, K. J., DiMaggio, C., & Karpati, A. (2011). Estimated deaths attributable to social factors in the United States. *American journal of public health*, 101(8), 1456-1465.

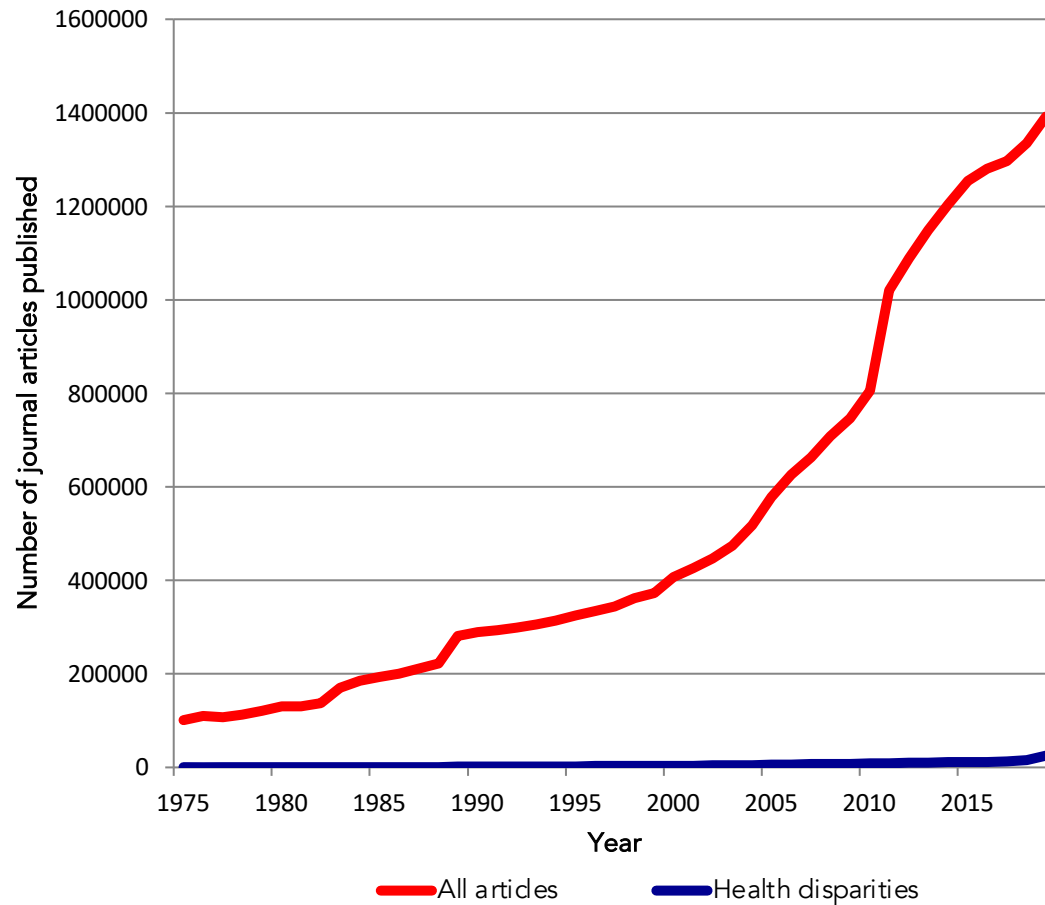
Bartz, D., Chitnis, T., Kaiser, U. B., Rich-Edwards, J. W., Rexrode, K. M., Pennell, P. B., ... & Seely, E. W. (2020). Clinical advances in sex-and gender-informed medicine to improve the health of all: a review. *JAMA Internal Medicine*, 180(4), 574-583.

Bowleg, L. (2012). The problem with the phrase women and minorities: intersectionality—an important theoretical framework for public health. *American journal of public health*, 102(7), 1267-1273.

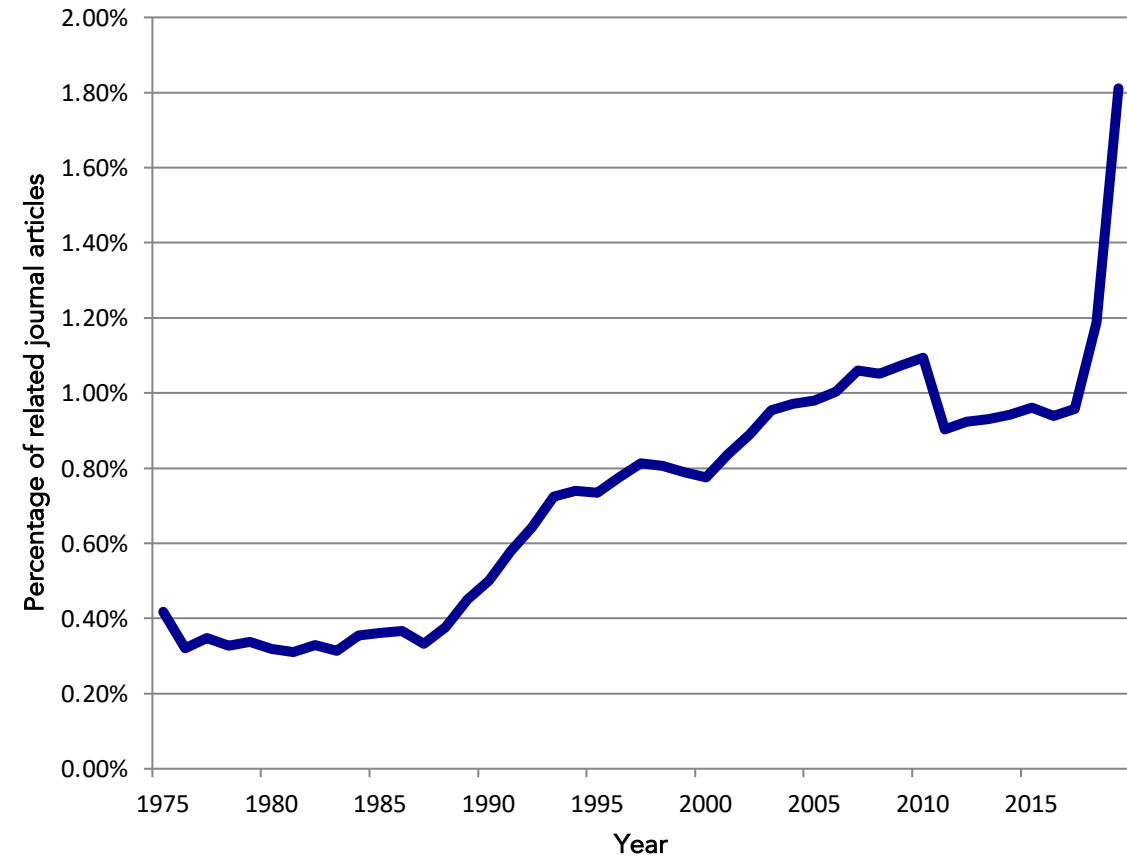


Health disparities research

Publication count by year, 1975-2019



Percent of articles related to health disparities/
minority health by year, 1975-2019



Graphics: Harry Reyes Nieva, Columbia University



The opportunity

- Observational health data are a particularly valuable source of information to study disparities
- We'd like to characterize health and healthcare disparities
 - Across different cohorts
 - Across different subgroups
 - Across different outcomes
 - Across databases / countries
- Sounds like a **large-scale characterization** question!



The vision

- Large-scale characterization is the first step towards **advancing knowledge** of health disparities and ultimately **reducing** them
 - OHDSI community's input with phenotyping and adding databases to this project, HERA will support
 - Generating hypotheses across a wide range phenotypes and subgroups
 - Identifying conditions under which subgroup differences must be mitigated when building predictive models and causal inference analyses
 - Detangling biological differences from implicit healthcare biases
-



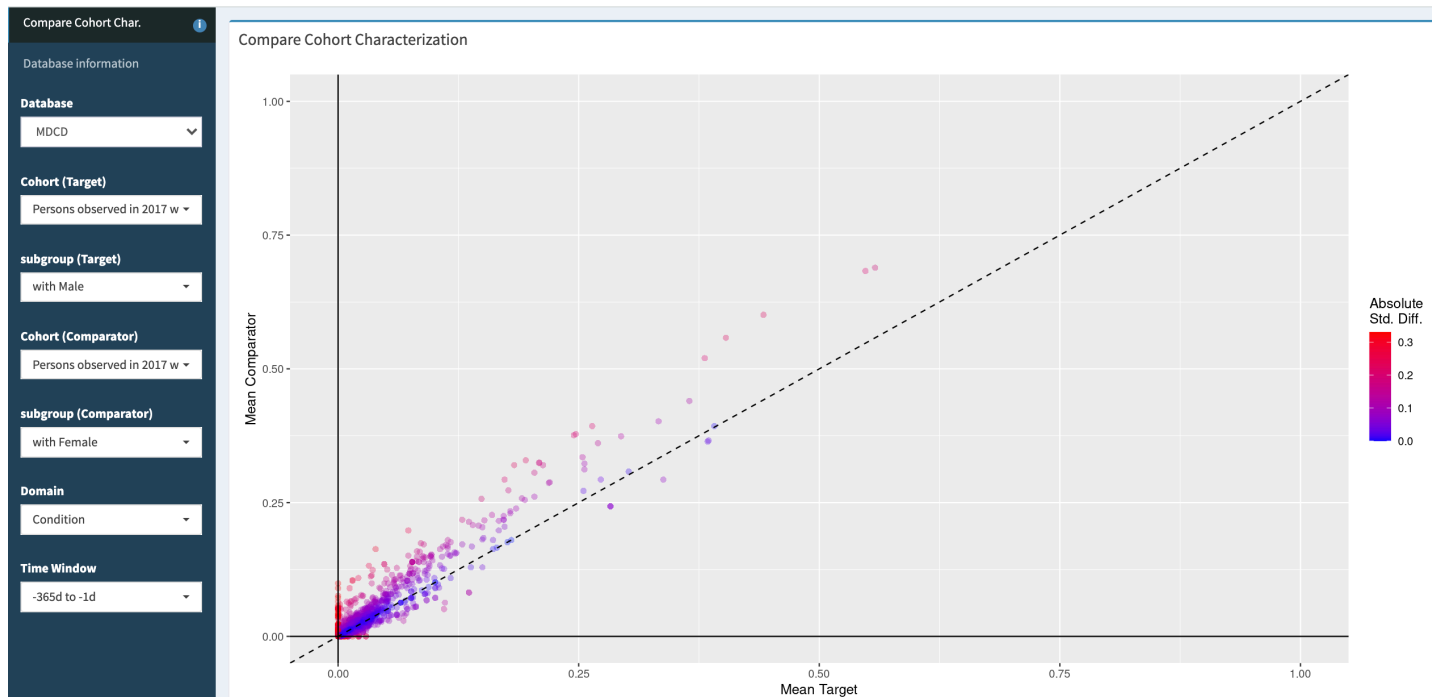
Project HERA - Health Equity Research Assessment

- <https://data.ohdsi.org/HERACharacterization/>
- Gender (Male/Female) and race (Black/White) disparities
- Starting with 10 databases
- Two stories
 - Characterize population-level race/gender differences in cross-sectional analysis of individuals in 2017 with 3+ years of prior data
 - Focusing on a specific cohort (patients with Crohn's disease), compare burden of disease across different subgroups



Story 1 - Population-level analysis

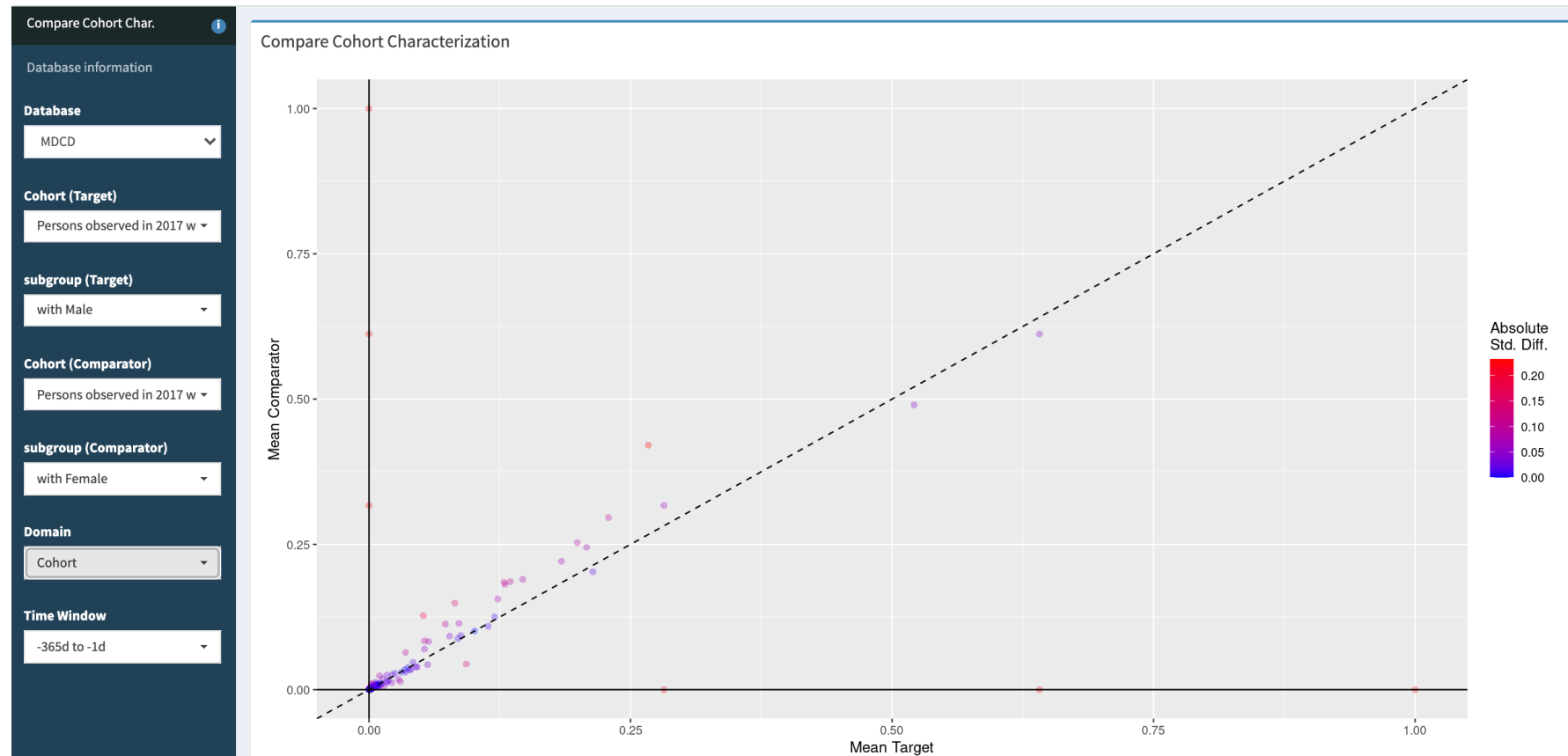
- Across 12 databases, 23M+ patients
- Wide majority of diagnosis codes are more prevalent for women compared to men



Medicaid
Persons aged 40-49



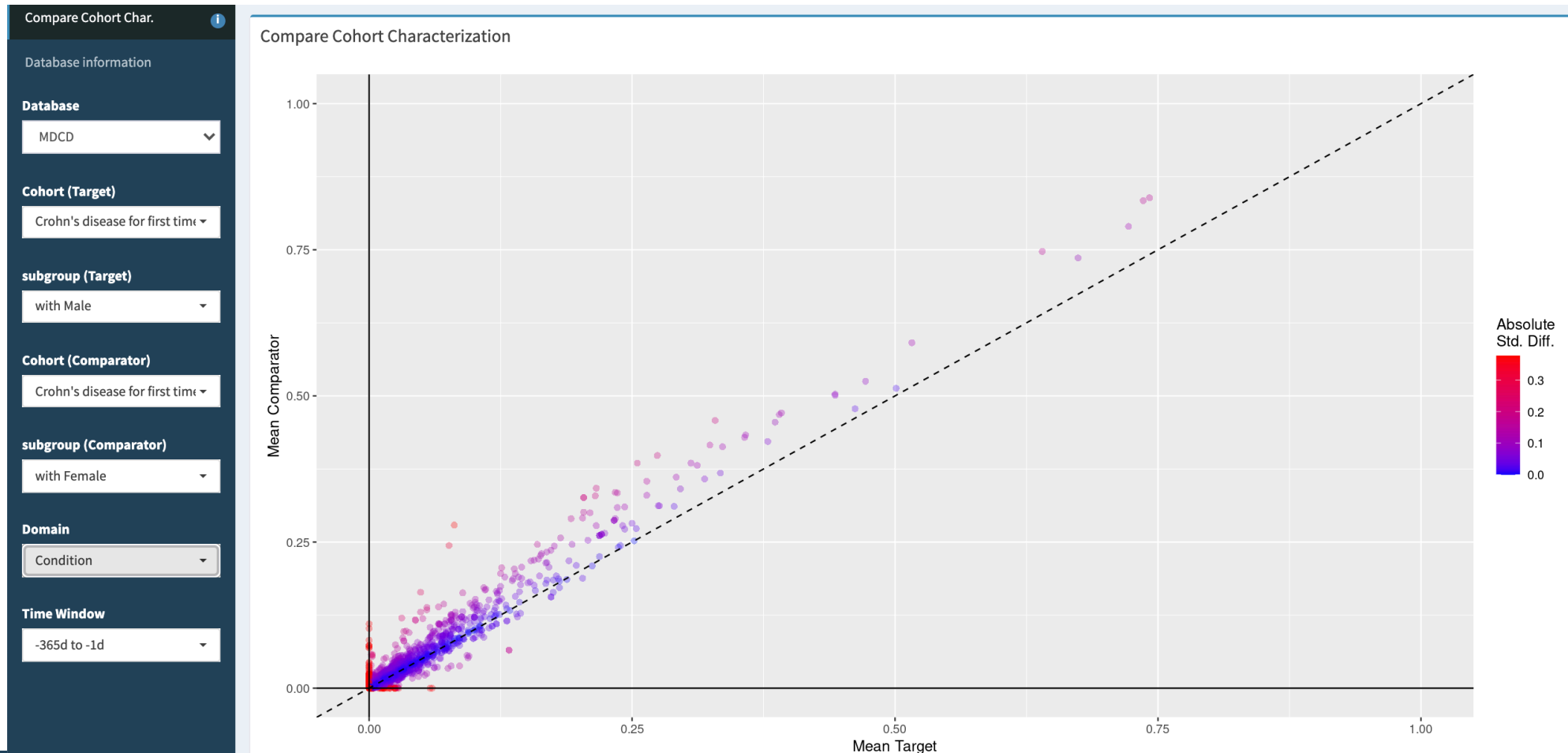
- Same pattern when looking at prevalence of specific, validate phenotypes from the phenotype library





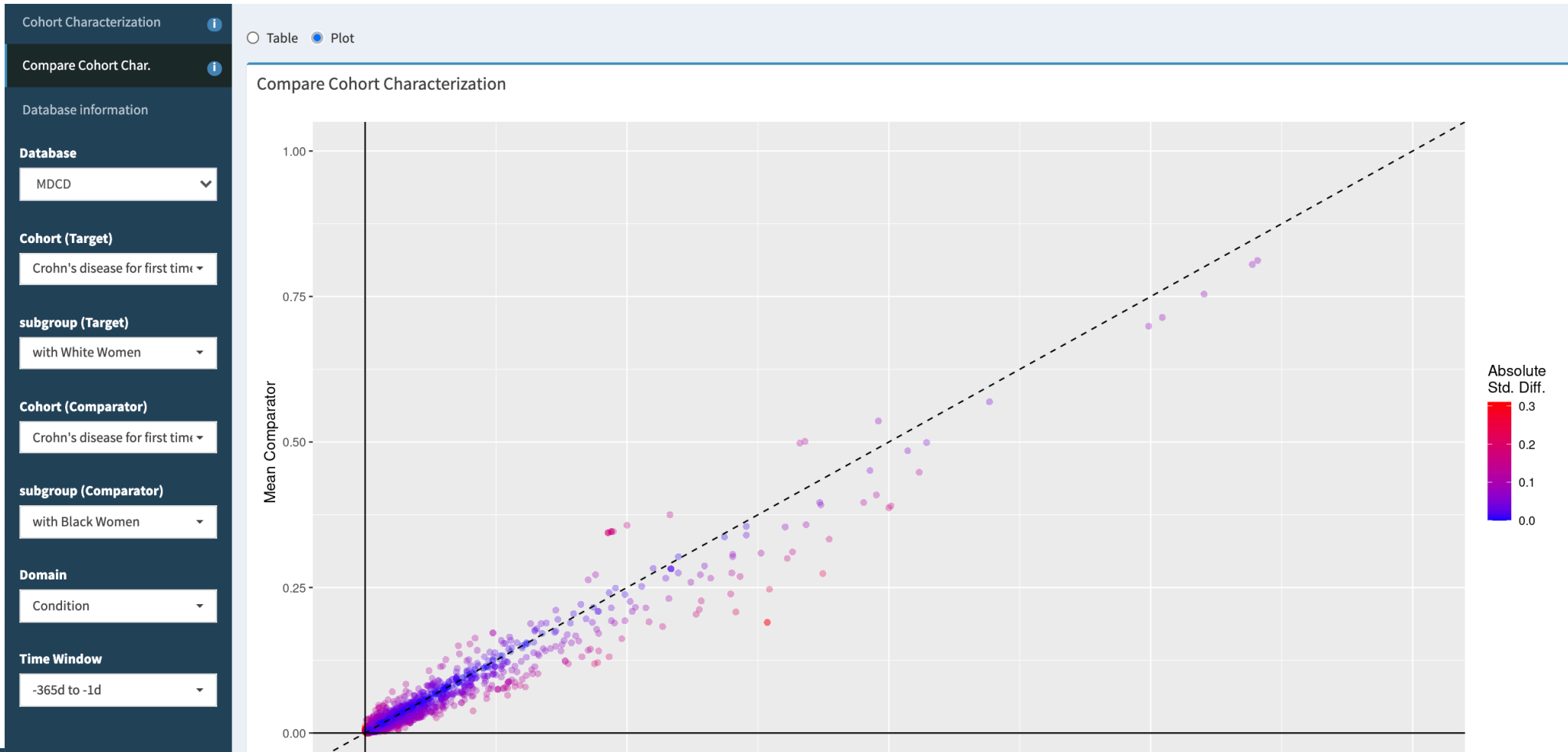
Story 2 – Patients with Crohn's disease

- Male vs Female, window: 1 year prior diagnosis, Medicaid





- Significant differences in subgroups





- Table view

Cohort Characterization					
Compare Cohort Char.					
Database information					
Database					
MDCD					
Cohort (Target)					
Crohn's disease for first time					
subgroup (Target)					
with White Women					
Cohort (Comparator)					
Crohn's disease for first time					
subgroup (Comparator)					
with Black Women					
Domain					
Condition					
Time Window					
-365d to -1d					

Table

Plot

Show 25 entries

Search:

Covariate name	Mean Target	SD Target	Mean Comparator	SD Comparator	StdDiff
condition_era group during day -365 through -1 days relative to index: Anxiety	38.4%	0.49	19.0%	0.39	-0.31
condition_era group during day -365 through -1 days relative to index: Anxiety disorder	38.4%	0.49	19.0%	0.39	-0.31
condition_era group during day -365 through -1 days relative to index: Mood disorder	43.7%	0.50	27.4%	0.45	-0.24
condition_era group during day -365 through -1 days relative to index: Tracheobronchial disorder	35.4%	0.48	20.8%	0.41	-0.23
condition_era group during day -365 through -1 days relative to index: Depressive disorder	38.6%	0.49	24.7%	0.43	-0.21
condition_era group during day -365 through -1 days relative to index: Bronchiolar disease	22.2%	0.42	12.1%	0.33	-0.19
condition_era group during day -365 through -1 days relative to index: Chronic obstructive lung disease	21.9%	0.41	11.9%	0.32	-0.19
condition_era group during day -365 through -1 days relative to index: Bronchitis	23.3%	0.42	13.1%	0.34	-0.19
condition_era group during day -365 through -1 days relative to index: Chronic disease of respiratory system	31.6%	0.47	20.4%	0.40	-0.18
condition_era group during day -365 through -1 days relative to index: Generalized anxiety disorder	10.3%	0.30	3.8%	0.19	-0.18
condition_era group during day -365 through -1 days relative to index: Nicotine dependence	31.9%	0.47	21.2%	0.41	-0.17
condition_era group during day -365 through -1 days relative to index: Drug dependence	34.9%	0.48	23.9%	0.43	-0.17
condition_era group during day -365 through -1 days relative to index: Inflammatory disorder of lower respiratory tract	28.4%	0.45	18.3%	0.39	-0.17
condition_era group during day -365 through -1 days relative to index: Bipolar disorder	13.6%	0.34	6.5%	0.25	-0.17
condition_era group during day -365 through -1 days relative to index: Hypothyroidism	15.3%	0.36	7.9%	0.27	-0.16
condition_era group during day -365 through -1 days relative to index: Inflammatory disorder of the respiratory tract	50.0%	0.50	38.7%	0.49	-0.16
condition_era group during day -365 through -1 days relative to index: Acute respiratory disease	44.3%	0.50	33.3%	0.47	-0.16
condition_era group during day -365 through -1 days relative to index: Inflammatory disorder of the respiratory system	50.2%	0.50	39.0%	0.49	-0.16
condition_era group during day -365 through -1 days relative to index: Traumatic injury	40.3%	0.49	30.0%	0.46	-0.15
condition_era group during day -365 through -1 days relative to index: Major depressive disorder	22.3%	0.42	14.1%	0.35	-0.15
condition_era group during day -365 through -1 days relative to index: Musculoskeletal and connective tissue disorder	32.1%	0.47	22.7%	0.42	-0.15
condition_era group during day -365 through -1 days relative to index: Acute sinusitis	14.8%	0.35	8.2%	0.28	-0.15
condition_era group during day -365 through -1 days relative to index: Sinusitis	19.4%	0.40	11.9%	0.32	-0.15



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Are you in? Join us! We need you!
data.ohdsi.org/HERACharacterization/