



# Population-level Estimation #1: Hydroxychloroquine

Dani Prieto-Alhambra  
University of Oxford



# BACKGROUND

## What have we achieved?

### TWO RQs

1. What is the safety profile of hydroxychloroquine?
  2. What is its potential anti-viral efficacy?
-



# METHODS

## DESIGN

1. Comparative cohort HCQ (t) vs SSZ (o) in RA patients
2. SCCS (regardless of indication)

## PARTICIPANTS

1. RA diagnosis + new use of HCQ or SSZ
2. HCQ use (on/off) + outcome of interest (“case”)



## METHODS (2)

### OUTCOMES

1. Serious adverse events, including: arrhythmia, cv disease, vte, liver failure, kidney failure, GI bleeds, mortality
2. Flu/viral infections, hospitalized pneumonia (not in SCCS)

### ANALYSES

1. PS stratification + negative control outcome calibration
  - On treatment and ITT (up to 5y)
2. Age and season-adjusted SCCS



# RESULTS (VTE)

## *Power*

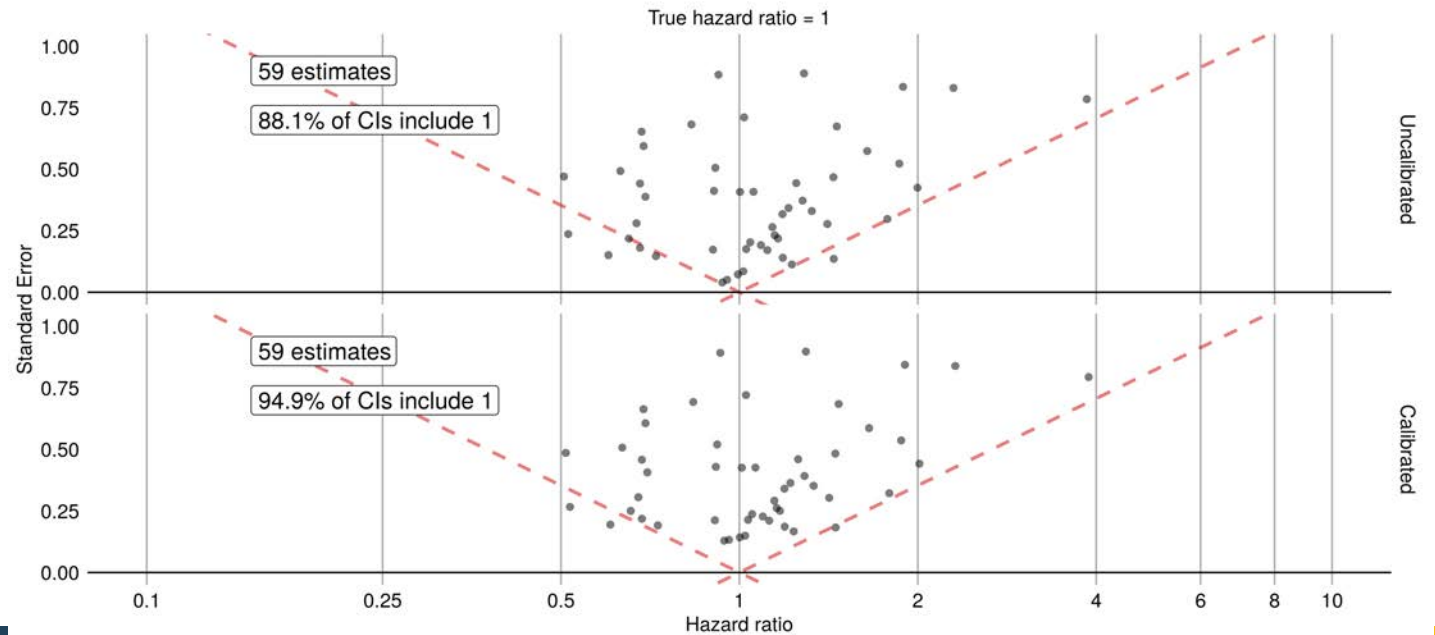
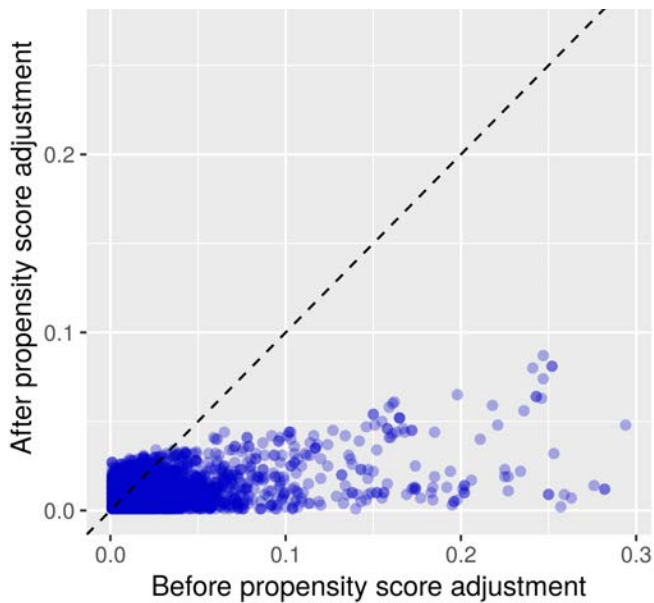
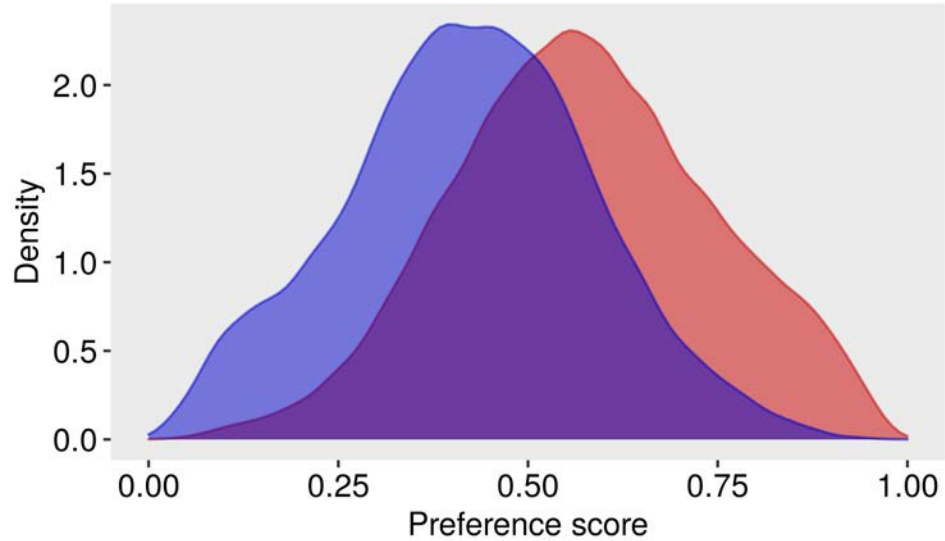
DATA SOURCE	N HCQ	N SSZ	T events HCQ	C events SSZ
CCAE	66,162	23,319	641	159
CPRD	9,134	11,401	131	176
IQVIA-DE	3,898	5,052	34	47
OPTUM	51,288	17,464	946	209
<b>TOTAL</b>	<b>130,482</b>	<b>57,236</b>	<b>1,752</b>	<b>591</b>



# RESULTS (VTE)

## *Diagnostics (CCA)*

- ✓ PS overlap
- ✓ Covariate balance
- ✓ Negative control outcomes





# RESULTS (3)

## Risk estimates

### OHDSI COVID-19 Studyathon: Hydroxychloroquine population-level effect estimation

About Explore results

**Target**

[OHDSI Cov19] New users of Hydroxychloroquine with prior rheumatoid arthritis

**Comparator**

[OHDSI Cov19] New users of sulfasazine with prior rheumatoid arthritis

**Outcome**

[LEGEND HTN] Venous thromboembolic (pulmonary embolism and deep vein thrombosis) events

Show 15 entries

Analysis	Data source	HR	LB	UB	P	Cal.HR	Cal.LB	Cal.UB
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	CCAIE	0.99	0.82	1.20	0.92	1.00	0.74	1.35
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	CPRD	1.06	0.81	1.38	0.66	1.01	0.52	1.98
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	IQVIA_GERMANY	0.98	0.58	1.63	0.94	0.72	0.42	1.23
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	OptumDOD	1.04	0.89	1.22	0.64	1.06	0.84	1.32
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	CCAIE	0.97	0.87	1.07	0.51	0.98	0.88	1.10
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	CPRD	0.99	0.83	1.19	0.94	1.01	0.83	1.23
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	IQVIA_GERMANY	0.86	0.65	1.14	0.30	0.76	0.57	1.02
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	OptumDOD	0.95	0.87	1.04	0.24	0.97	0.88	1.07

Showing 1 to 8 of 8 entries

Previous

- Data source**
- CCAIE
  - CPRD
  - IQVIA\_GERMANY
  - OptumDOD



# RESULTS (3)

## *Risk estimates*

<b>Analysis</b>	<b>Data source</b>	<b>HR</b>	<b>LB</b>	<b>UB</b>	<b>P</b>	<b>Cal.HR</b>	<b>Cal.LB</b>	<b>Cal.UB</b>	<b>Cal.P</b>
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	CCAIE	0.99	0.82	1.20	0.92	1.00	0.74	1.35	0.88
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	CPRD	1.06	0.81	1.38	0.66	1.01	0.52	1.98	0.83
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	IQVIA_GERMANY	0.98	0.58	1.63	0.94	0.72	0.42	1.23	0.28
No prior outcome in last 30d, 5 PS strata, TAR on-treatment+14d	OptumDOD	1.04	0.89	1.22	0.64	1.06	0.84	1.32	0.69
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	CCAIE	0.97	0.87	1.07	0.51	0.98	0.88	1.10	0.77
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	CPRD	0.99	0.83	1.19	0.94	1.01	0.83	1.23	0.73
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	IQVIA_GERMANY	0.86	0.65	1.14	0.30	0.76	0.57	1.02	0.09
No prior outcome in last 30d, 5 PS strata, TAR intent-to-treat 5yr	OptumDOD	0.95	0.87	1.04	0.24	0.97	0.88	1.07	0.56





# DISCUSSION

## COMPLETED

- ✓ The biggest study to date on the safety of HCQ
- ✓ Reassuringly, no consistent signals found

## WORK IN PROGRESS

- Running across the whole network (where possible)
- SCCS

## OUTSTANDING

- Anti-viral efficacy (new user design in COVID19 infectees)