

Economic Beliefs and the Local Coronavirus Pandemic

Raymond Duch

raymond.duch@nuffield.ox.ac.uk

Peiran Jiao

p.jiao@maastrichtuniversity.nl

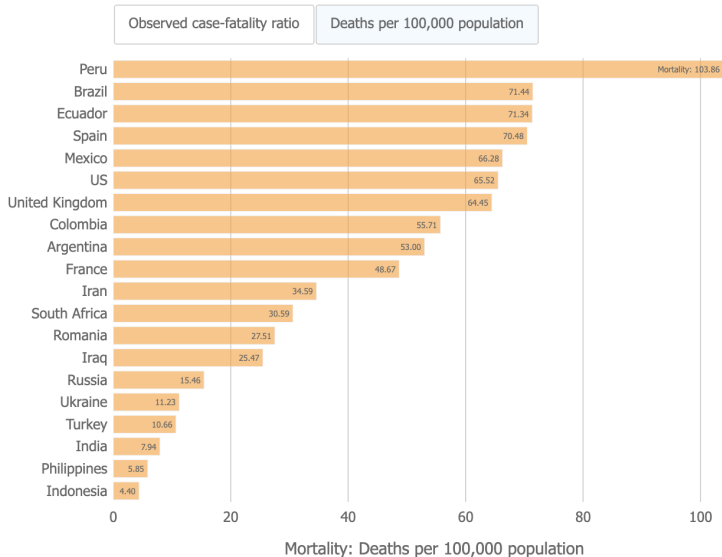
Thomas Robinson

thomas.robinson@durham.ac.uk

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COVID-19 Death Rate World



Economic Preferences?

- ▶ Classic theory
 - ▶ Stable
 - ▶ Do not update in response to rare events
- ▶ What are economic preferences?
 - ▶ Risk preferences
 - ▶ Time discounting
 - ▶ Altruism/other-regarding preferences
- ▶ A conjecture
 - ▶ Economic preferences are not stable
 - ▶ And they are responsive to rare events
 - ▶ COVID-19 pandemic has changed economic preferences

Mixed Evidence

- ▶ Natural Disasters
 - ▶ Hanaoka et al 2018 AJE Applied
 - ▶ versus Cassar et al 2017 World Development
- ▶ 2008 Great Recession
 - ▶ Fisman et al 2015 JPE
- ▶ Violence
 - ▶ Jakiela et al 2019 REStat
 - ▶ Callen and Long 2015 AER
- ▶ COVID-19
 - ▶ Angrisani 2020
 - ▶ Branas-Garza 2020

COVID-19 Infection Rates and Economic Preferences

- ▶ March, 2020
- ▶ COVID-19 “shock” varied significantly across communities
 - ▶ China: (10 cities)
 - ▶ Italy: (12 provinces)
 - ▶ Chile: (11 comunas)
 - ▶ Infection metric: High (top 25 quartile) Medium (25-75) Low (bottom 25 quartile)
- ▶ Global pandemic
 - ▶ the “shock” is not local but rather global
 - ▶ global COVID-19 infections matter
- ▶ Identification
 - ▶ “As if random assignment”

Sample Demographics: Chile, China, Italy

Ctry	N	Infect	Education		Gender		Age			
			High	Med.	M	F	≤34	35-40	45-64	65+
Chile	980		78%	22%	37%	63%	45%	23%	27%	5%
	226	High	89%	13%	41%	59%	43%	19%	33%	5%
	478	Med	77%	23%	39%	61%	45%	21%	28%	6%
	276	Low	73%	27%	31%	69%	49%	28%	22%	2%
China	1500		60%	39%	54%	46%	62%	33%	5%	0%
	300	High	63%	37%	52%	48%	64%	32%	4%	0%
	750	Med	62%	38%	52%	48%	64%	31%	5%	0%
	450	Low	57%	42%	58%	42%	58%	36%	5%	0%
Italy	774		61%	39%	40%	60%	62%	19%	18%	1%
	173	High	58%	42%	45%	55%	66%	19%	15%	0%
	383	Med	63%	37%	38%	62%	61%	18%	20%	1%
	217	Low	61%	39%	39%	61%	60%	19%	17%	1%

Were subjects treated?

Variations in awareness and compliant behavior

- ▶ Subjective awareness
 - ▶ Severe infection rates?
 - ▶ Contact with cases?
 - ▶ Know fatalities?
 - ▶ Lockdown severity

- ▶ Compliant behavior
 - ▶ Masks
 - ▶ Children at school
 - ▶ Avoid crowds

Awareness

	Severity city	People died
GDP	-0.225* (0.118)	-0.068 (0.072)
Male	-0.157* (0.082)	-0.015 (0.023)
Age	0.019*** (0.004)	0.006* (0.004)
Education Medium	-0.222** (0.090)	0.060 (0.124)
Infection Rate	0.048*** (0.005)	0.025*** (0.009)
Constant	6.382*** (0.316)	-0.210 (0.174)
Observations	3,093	3,091
R ²	0.142	0.143
Adjusted R ²	0.140	0.141

Compliance

	Wear mask	Avoid crowds
GDP	0.308 (0.262)	-0.264 (0.433)
Male	-1.892*** (0.632)	-2.333** (0.971)
Age	0.092* (0.048)	0.110*** (0.038)
Education Medium	-3.462*** (1.035)	-3.072*** (0.675)
Infection Rate	0.077*** (0.014)	0.046** (0.020)
Constant	89.917*** (1.842)	86.631*** (1.621)
Observations	3,093	3,093
R ²	0.166	0.045
Adjusted R ²	0.164	0.043

Infection Treatment Effects?

Risk, Time and Altruism

- ▶ Risk Aversion
 - ▶ Global Preference Survey Risk Staircase (Falk et al 2018)
 - ▶ Self-reported (Falk et al 2018)
 - ▶ Domain specific (Weber et al 2002)
- ▶ Time Preferences
 - ▶ Global Preference Survey Time Discounting Staircase (Falk et al 2018)
 - ▶ Self-reported (Falk et al 2018)
- ▶ Other-regarding Preferences
 - ▶ Donation
 - ▶ Reciprocity (positive)
 - ▶ Reciprocity (negative)

Risk and Time Preferences

	GPS Risk	GPS Patience
GDP	0.337 (0.282)	0.382 (0.259)
Male	1.578*** (0.357)	-0.076 (0.575)
Age	-0.007 (0.018)	-0.025 (0.030)
Education Medium	0.097 (0.419)	-1.807*** (0.359)
Infection Rate	-0.024** (0.011)	0.024* (0.013)
Constant	9.145*** (0.715)	9.740*** (1.051)
Observations	2,862	2,881
R ²	0.053	0.076
Adjusted R ²	0.051	0.074

Other-regarding Preferences

	Punish	Return Favor
GDP	-0.005 (0.049)	-0.032 (0.028)
Male	0.197** (0.098)	-0.182*** (0.062)
Age	-0.001 (0.008)	0.006*** (0.002)
Education Medium	-0.254** (0.111)	-0.264*** (0.091)
Infection Rate	0.0001 (0.002)	0.002** (0.001)
Constant	5.425*** (0.341)	10.078*** (0.075)
Observations	3,093	3,093
R ²	0.090	0.100
Adjusted R ²	0.088	0.098

Infection Treatment Effect?

- ▶ Treated?
 - ▶ Higher awareness
 - ▶ More compliance

- ▶ Economic preferences
 - ▶ Higher risk aversion
 - ▶ More patient
 - ▶ More altruistic

- ▶ Reservations?
 - ▶ “As if random assignment”
 - ▶ Heterogeneous treatment effects
 - ▶ Balance
 - ▶ Consequential effects?

Part II: Heterogeneity and Post-stratification

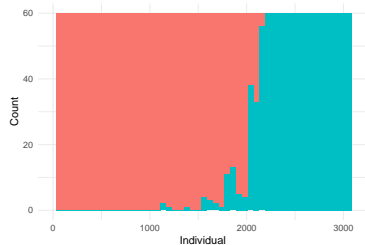
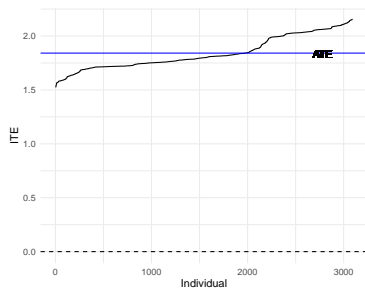
- ▶ Heterogeneity
 - ▶ BART
 - ▶ Identify CATEs
- ▶ Matching
 - ▶ BART generated CATEs inform matching strategy
 - ▶ Generate corrected overall infection treatment effects
- ▶ Post-stratification
 - ▶ Census micro-data at community level
 - ▶ Map estimated community infection to stratification cells

BART Estimation strategy

- ▶ Estimate $f(x) = E(Y|x)$
- ▶ Fit a *sequence* of “weak” tree-based regression models
- ▶ Each tree contributes a “a small and different portion of f ” (Chipman et al 2010)¹
- ▶ Iterative application of sum-of-trees effectively generates a posterior probability distribution of outcomes, given covariate vector X
- ▶ From which you can recover $E(Y|x)$ and uncertainty intervals

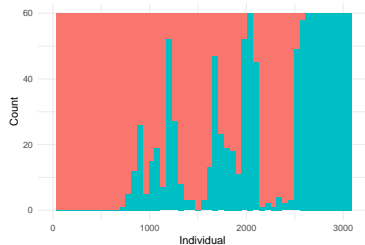
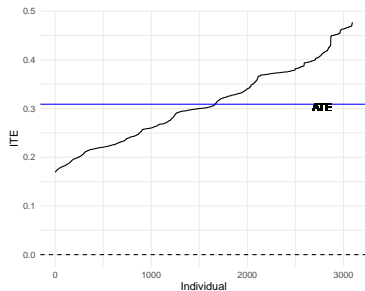
¹*BART: Bayesian Additive Regression Trees*, The Annals of Applied Statistics, 2010, Vo.4, No.1

Awareness



z_gps ■ Completed four years of education beyond ■ Secondary - 3 year Tertiary S

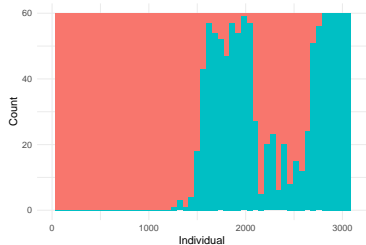
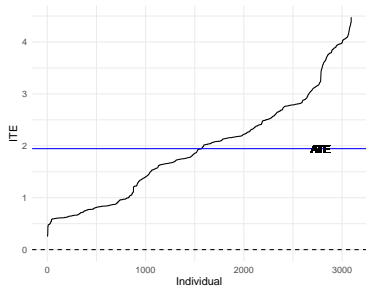
(a) Severity of COVID



z_gps ■ Completed four years of education beyond ■ Secondary - 3 year Tertiary S

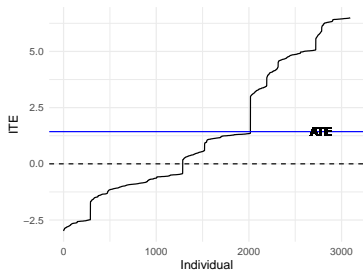
(b) Likelihood of COVID Spread

Compliance



Completed four years of education beyond Secondary - 3 year Tertiary S

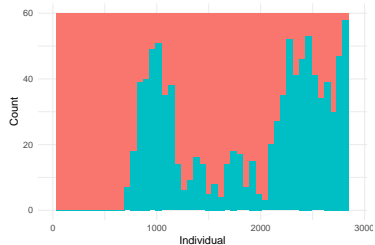
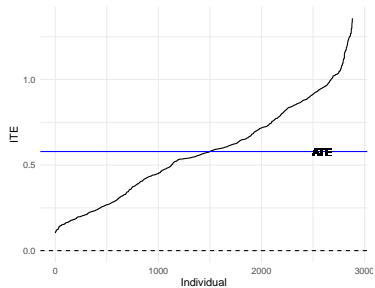
(e) Wear Masks in Public



Completed four years of education beyond Secondary - 3 year Tert

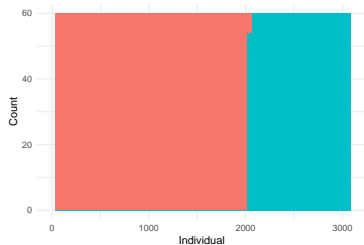
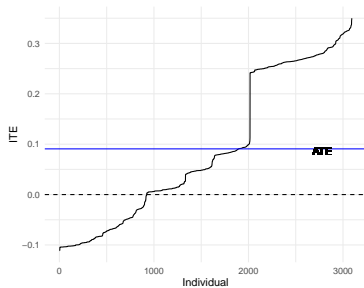
(f) Keep Children Home

Patience and Altruism



_:gps ■ Completed four years of education beyond ■ Secondary - 3 year Tertiary S

(g) Patience



_:gps ■ Completed four years of education beyond ■ Secondary - 3 year Tertiary S

(h) Return Favor

Conclusions

- ▶ Community infection rates
 - ▶ Community residents are aware of intensity
 - ▶ Their compliant behavior seems to respond appropriately
 - ▶ Economic preferences are not stable - they seem to also respond to these sudden rare events
- ▶ Heterogeneity
 - ▶ Infection treatment effects vary significantly in the population
 - ▶ Local intensity most informative to the less well educated
 - ▶ Updating economic preferences by less well educated
- ▶ Consequential (next step)
 - ▶ Matching
 - ▶ Post-stratification