UCLA California Center for Population Research

Comparative CoViD-19 Mortality Indicators: An Early Assessment

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Background

- Make suggestions to non-demographers public; illustrate w/ “real” data, need frequent updating:

medRxiv paper (May 5)

https://doi.org/10.1101/2020.04.29.20085506

- Reflecting back, what works/doesn’t, needs further investigation

#1: Deaths rather than cases

- Data on “excess” deaths => ~ 4:5 ratio to CoViD-19 deaths
- Not necessarily death undercount (depending on mortality from other causes) but order of magnitude smaller than case undercount: ~1:10 (Commercial Lab Seroprevalence Survey)
- Deaths more meaningful metric anyway

#2: Rates rather than ratios

- Deaths per capita: D/P
- v. CDR: D[0,T]/T.P(T/2)
- Diff. easy to miss when T=1 year, here dividing by days/366 to compare w/ overall mortality:

$$CCDR[t_1, t] = \frac{D^C[t_1, t]}{N(t_m).(t - t_1)}$$

#3: Standardize (yes you can)

- CoViD-19 death rates by age & sex may not be available => indirect standardization (*CMR*)

$$CCMR[t_1, t] = \frac{D^C[t_1, t]}{\sum_j \sum_i {}^{US}M^C_{ij}.\, N_{ij}(t_m)}$$

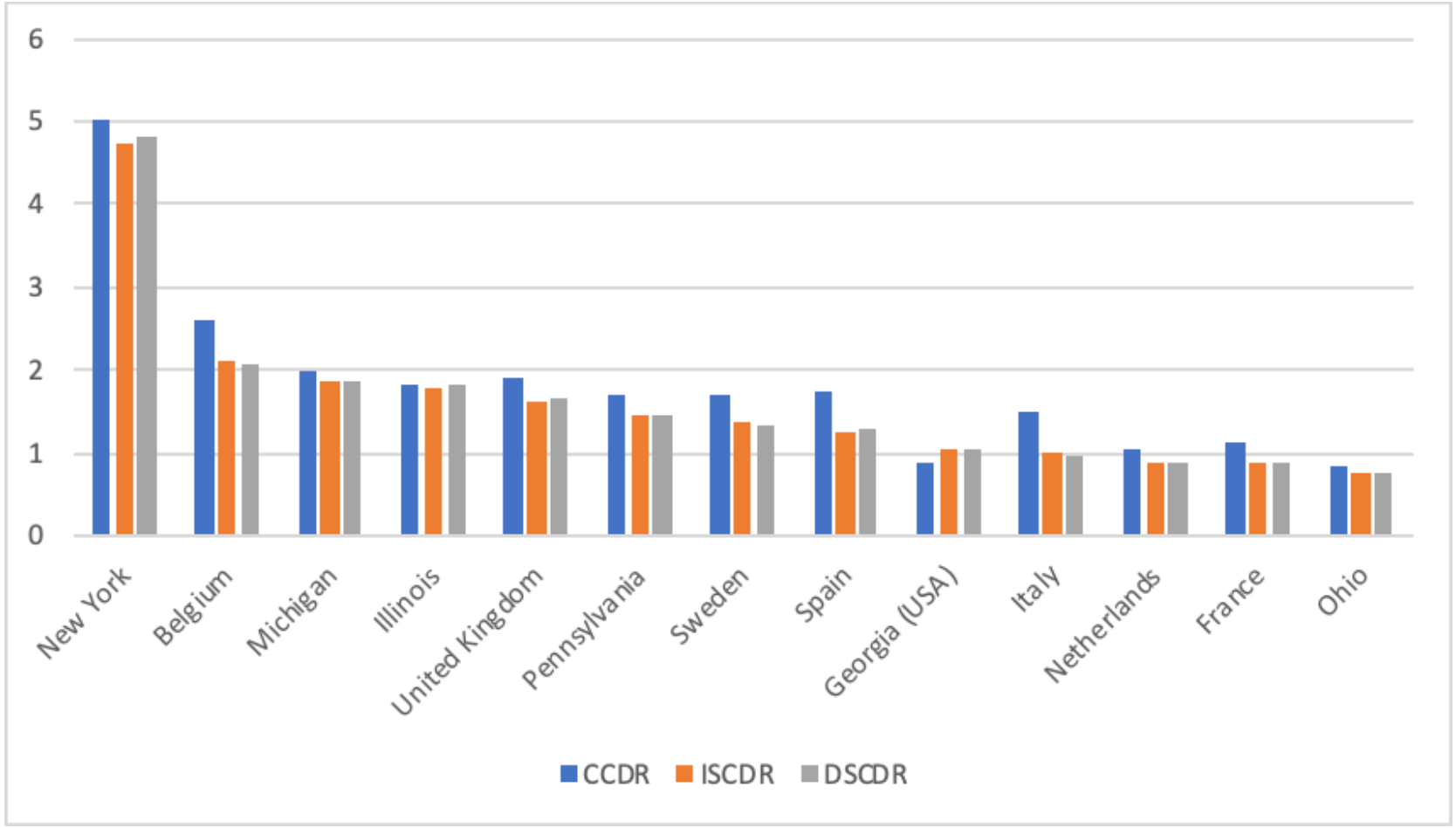
- *CCMR* compares to 1, to compare to (direct) *ASCDR*, mult. by US *CCDR*:

$$ISCDR[t_1, t] = \sum_j \sum_i \left({}^{US}M^C_{ij}.\, CCMR[t_1, t]\right).\, {}^{US}N_{ij}(t_m)$$

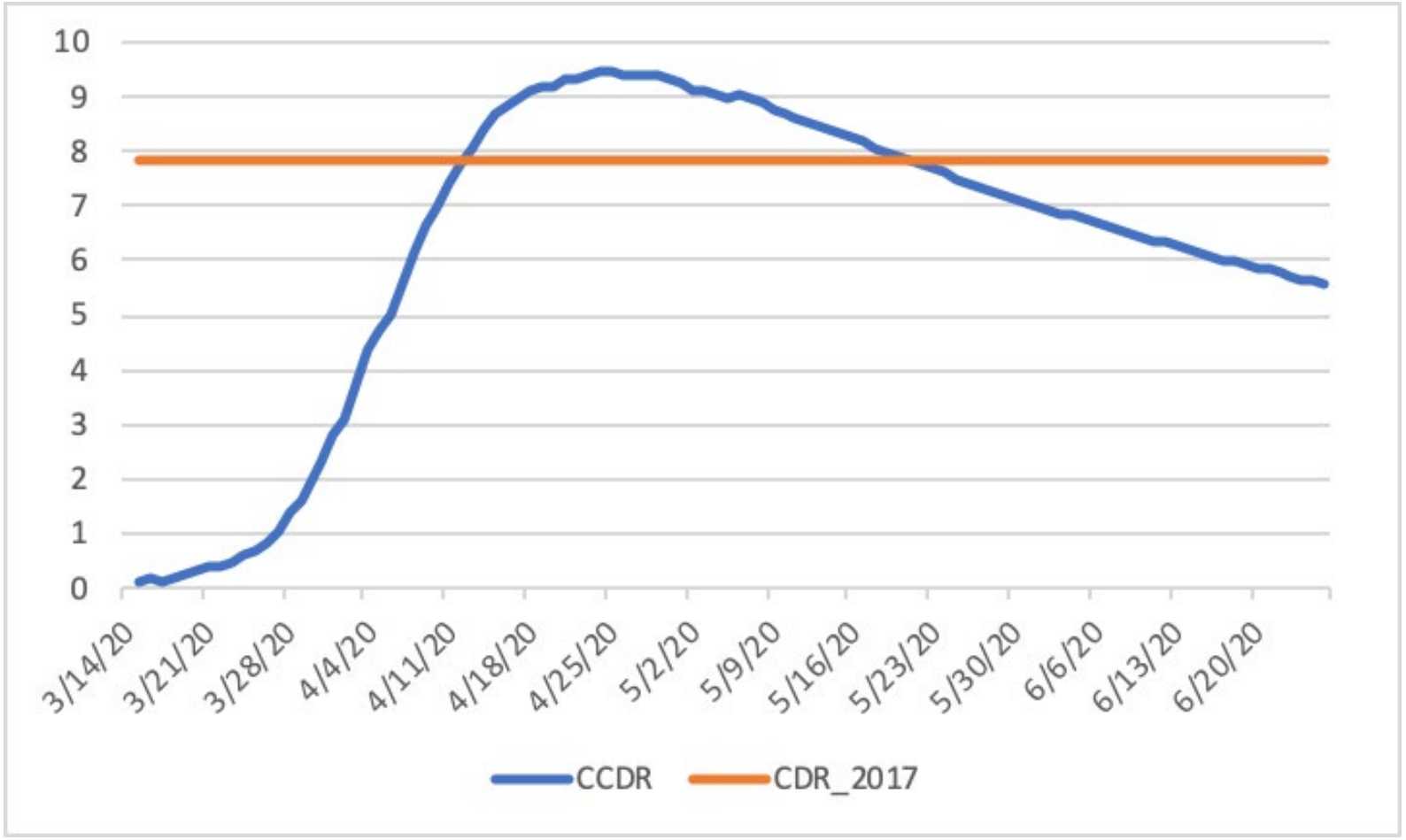
#4: Estimate life expectancies (l.t. & some assembly required)

- Reverse MDLT => ASDLT, w/ pre-CoViD-19 l.t. as ASDLT (-> independent prob.) & CoViD-19 death rates (-> dependent prob.)
- Most intuitive metric, can compare across populations & w/ previous public health crises (*e*(0) historical time series widely available)

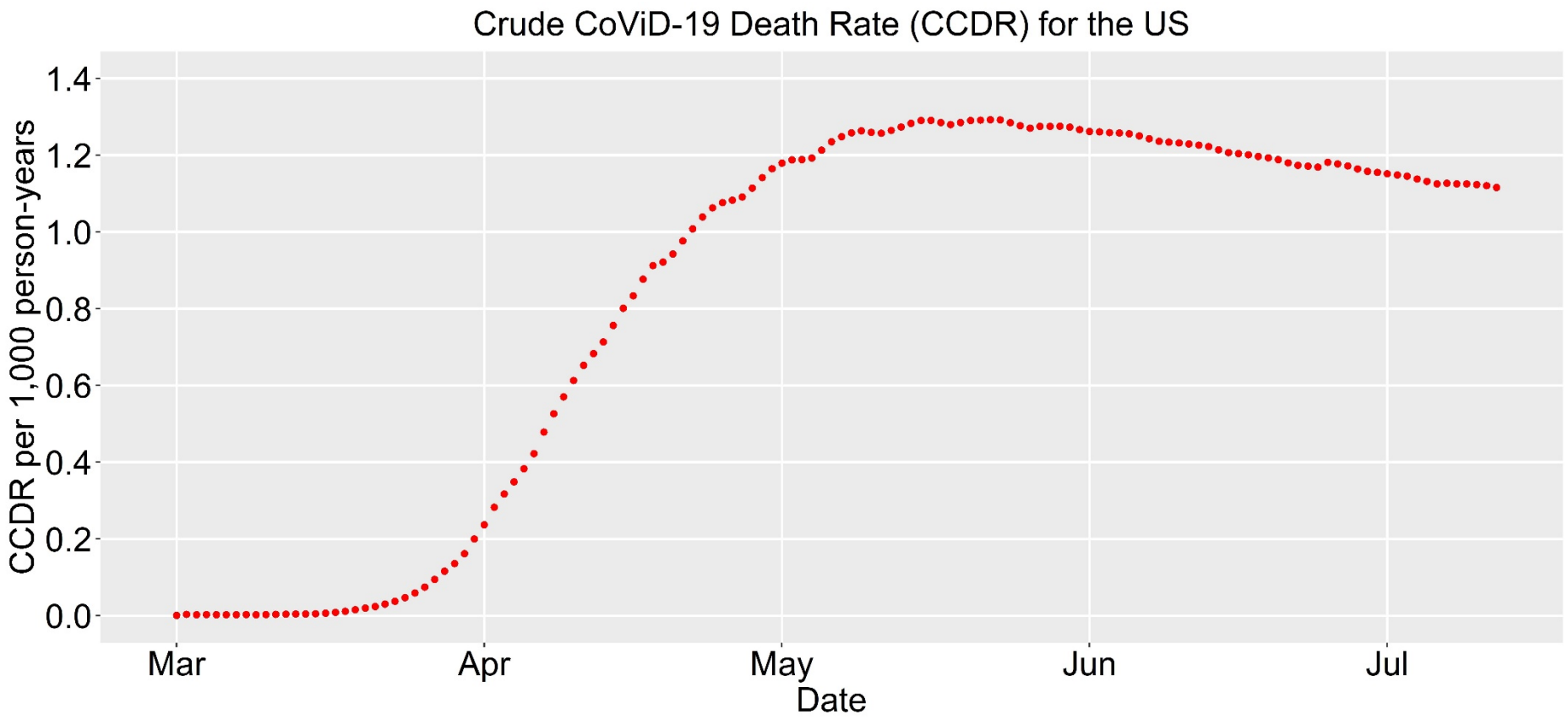
LL1: Indirect standardization works



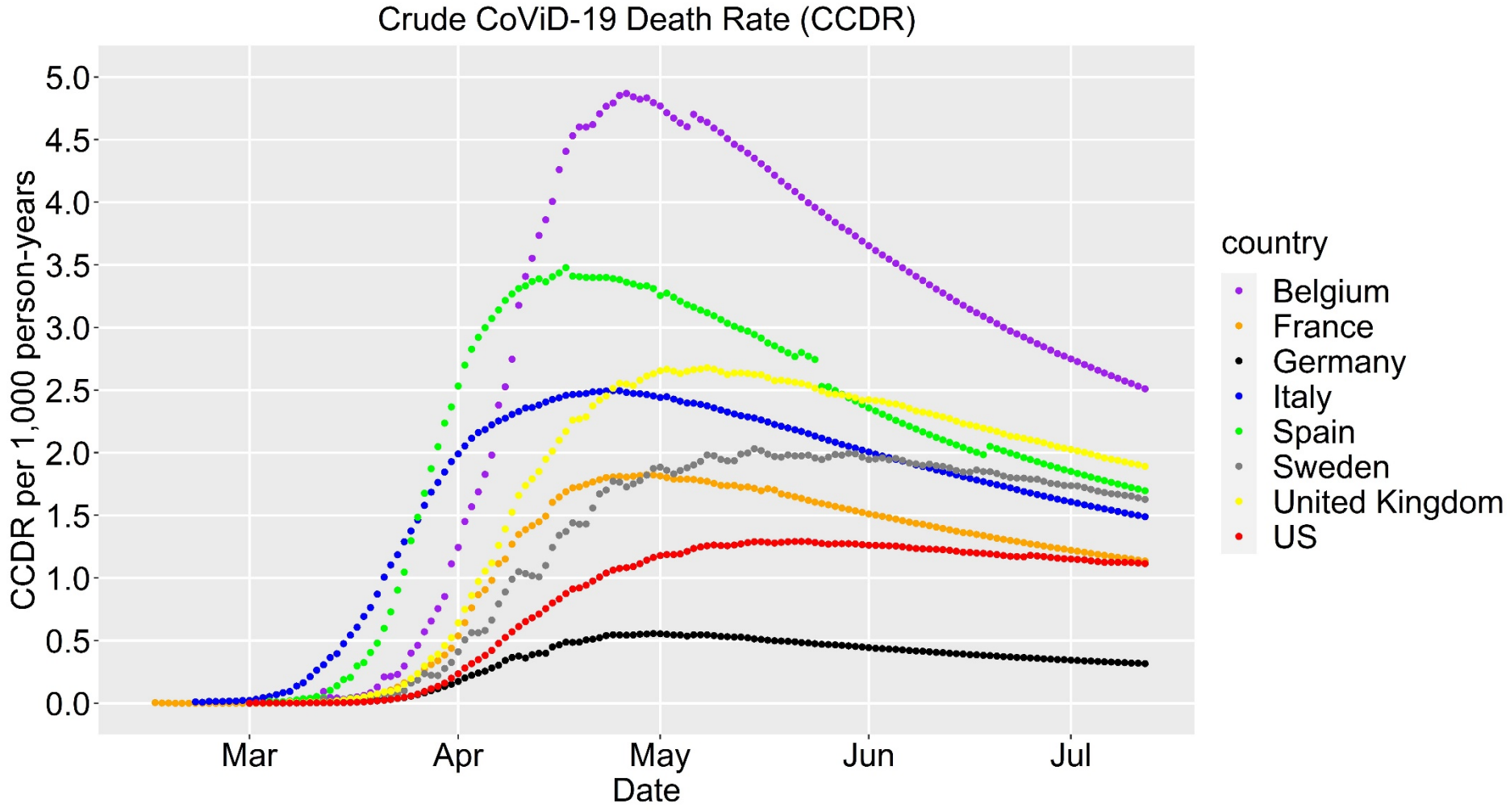
LL2: Duration still matters



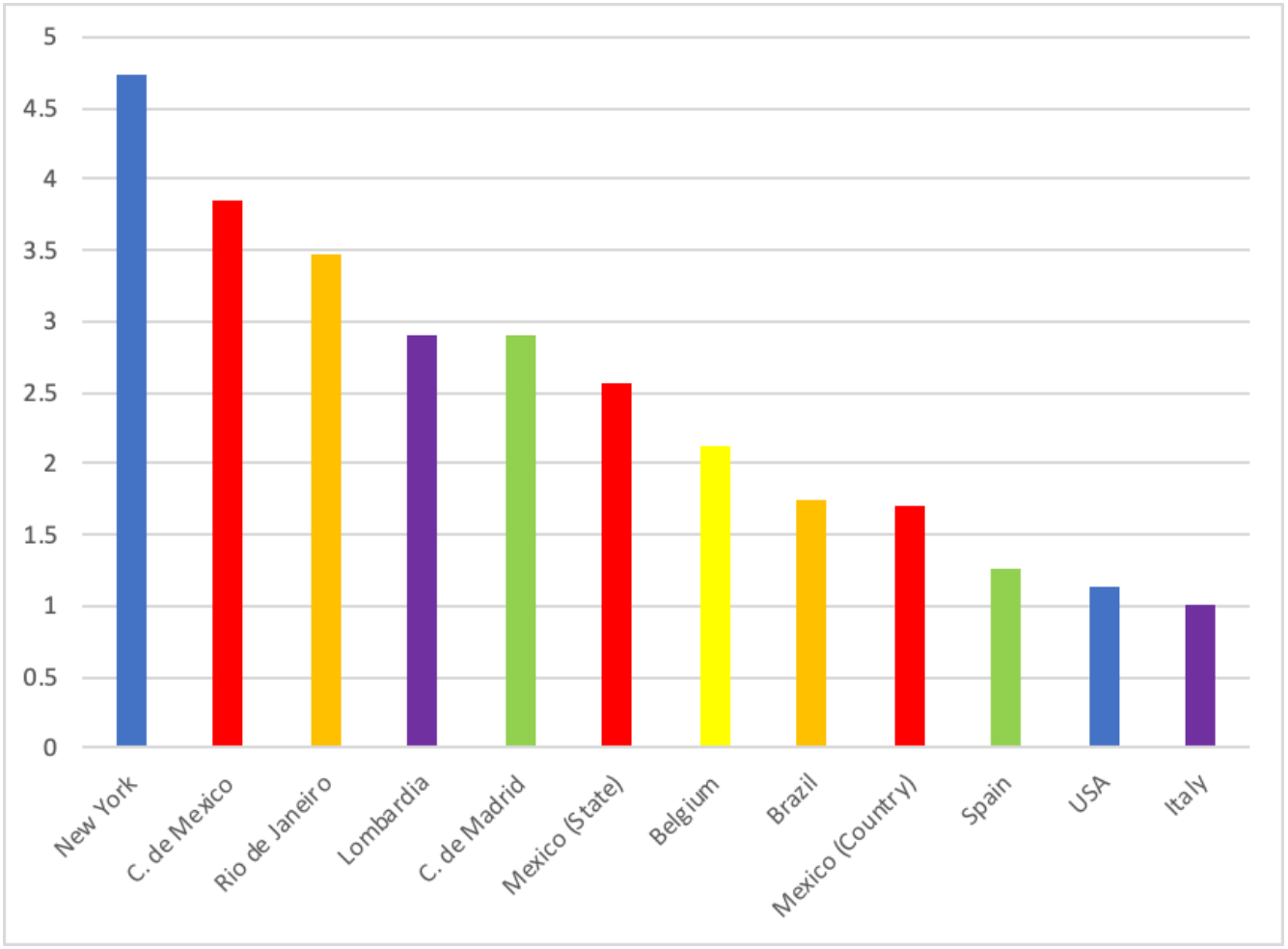
LL3: Population size still matters



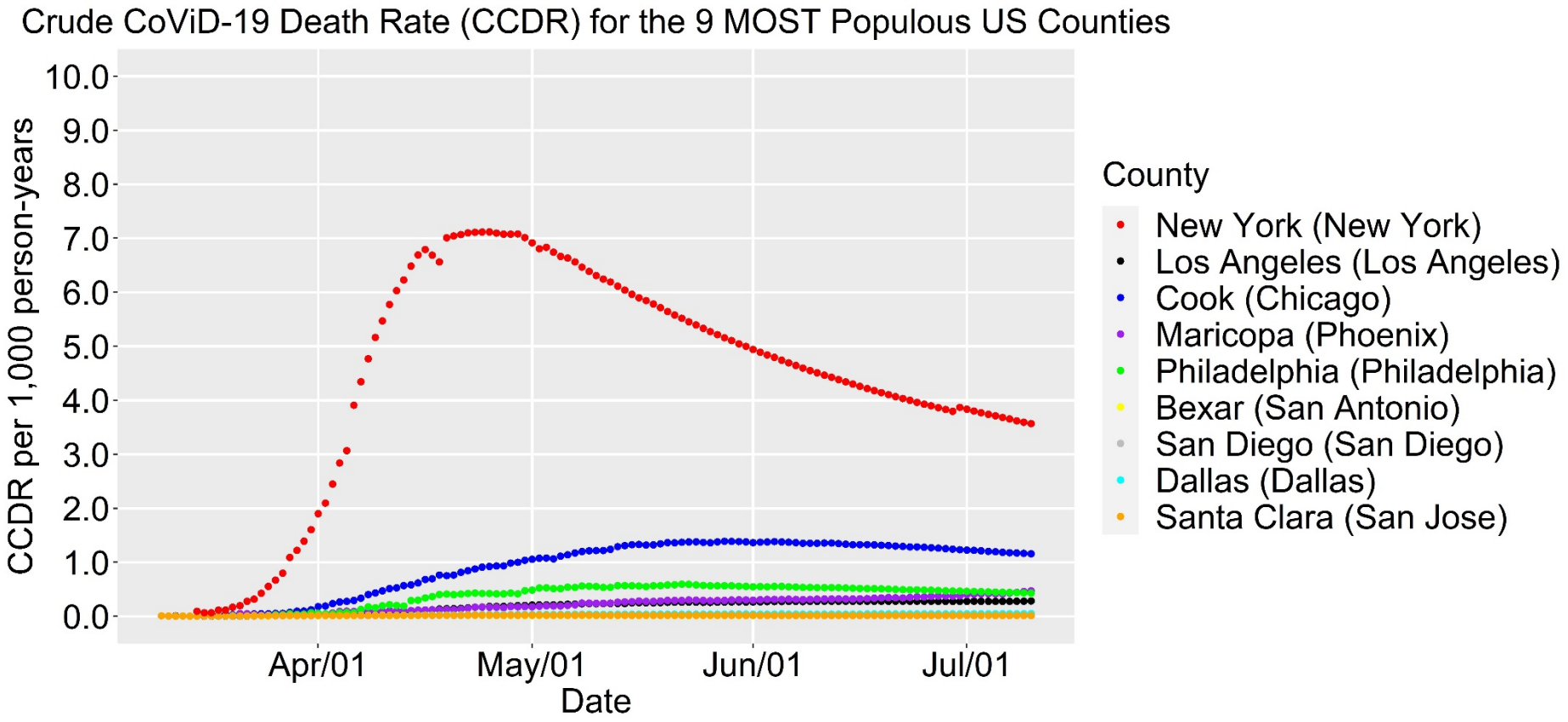
The US in Comparative Perspective



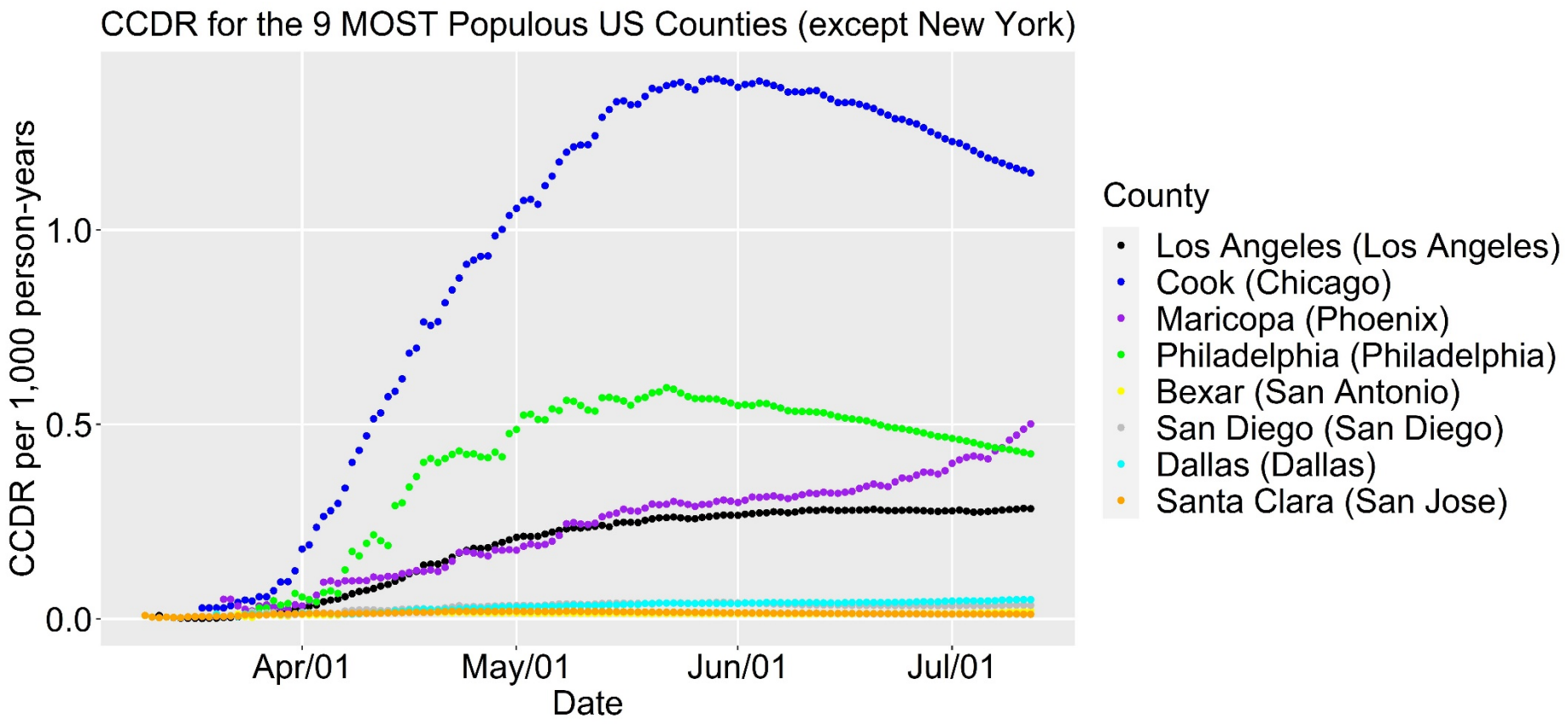
Population size still matters (cont.)



Heterogeneity Ruse



Heterogeneity Ruse (cont.)



LL4: *e*(0) may not impress

- *Δe*(0) rarely huge: in the US, -.3 yr b/w 2014 & 2017, and b/w 1992 & 1993
- In Europe & US, <1 yr for countries, may reach ~1.5 yr in Euro regions & 2 yr in US states
- In LatAm countries, maybe up to 2+ yr but CoViD trend harder to predict there
- Non-CoViD mortality trend hard to predict *everywhere*