

Mortality during India's COVID-19 pandemic

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A difficult problem!

Potential sources of data:

- Civil registration
- Panel/ survey data
- Epidemiological calculations/modelling
- Health information systems (e.g. HMIS)
- Others (burial/cremation records, life-insurance, ...)

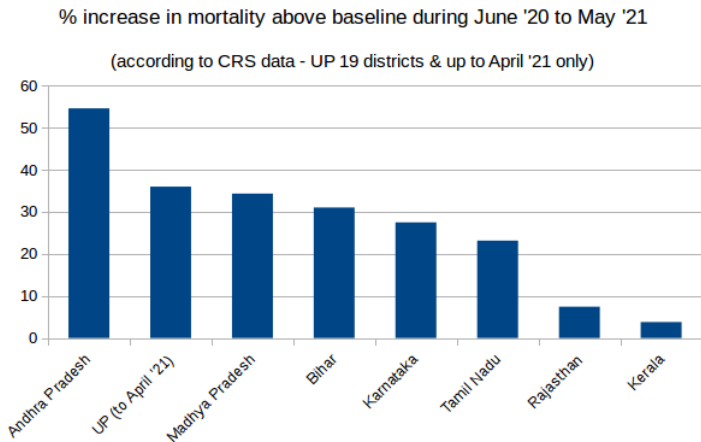
Limitations in each. Need to try and synthesise the information into something coherent.

Consistency: scale, split, timing

CRS and epidemiological data fairly consistent. CPHS data suggests higher estimates/ different timing?

- **Scale** of the surge over the pandemic period from CRS/epi calculations: 30-40%? (2.5M - 3.5M excess so far).
- **Waves**: ~45% in wave 1, ~55% in wave 2 (but wave 2 data incomplete – likely to skew further towards wave 2). CPHS data appears to suggest much higher wave 1 mortality?
- **Timing**: how do excess deaths estimates align with the timing of the epidemic?

The scale in different states: CRS-based

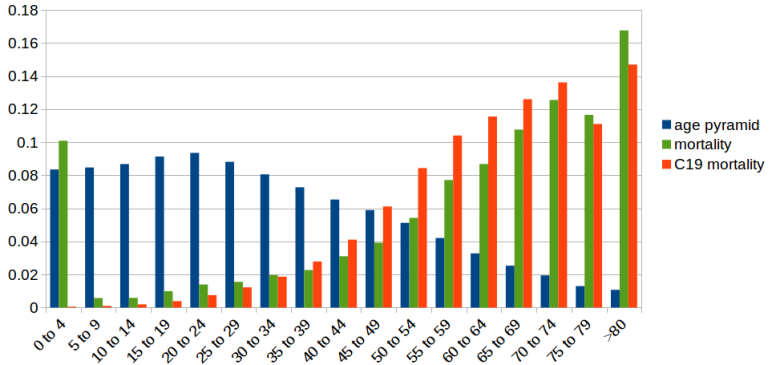


- (Survey) sampling/weighting risks. Exponential age-dependence increases these risks.
- (CRS and survey) How to choose a baseline, how to deal with trends?
- (CRS) Pandemic/lockdown effects on registration.
- (CRS) How to “extrapolate”? How has the pandemic differentially affected areas where registration is weaker/stronger?

Age-dependence of mortality

India: Age, mortality, expected C-19 mortality

(based on SRS 2018, MoHFW 2021 projections, and Levin et al - even spread)



IFR-based estimates of COVID-19 mortality

India's equal-spread IFR estimates from meta-analyses (2020):

- O'Driscoll: 0.24%,
- Brazeau: 0.3%,
- Verity/Levin: 0.41-0.45%

Expected COVID-19 deaths at 60% infection rate with even spread: **2.0M - 3.7M**

BUT we now have:

- vaccination of the elderly (pushing IFR down)
- possibly more lethal variants (pushing IFR up)

- Survey / panel data is a valuable tool for estimating pandemic mortality.
- The story is still unclear – but a broad consensus is emerging about the high mortality.
- We don't know how many excess deaths are from COVID-19.
- First wave devastation was spread out in time, but also very high.
- Filling the gaps: need to reconcile mortality data and epidemiological data with care.

The work needs to continue!