# Public Review of TIFR's Mumbai Simulation Writeup

*08 Sep 2020, Bhaskaran Raman, Dept of CSE, IIT Bombay*

*URL for this review: http://bit.ly/review-tifr-mumbai*

This is a public review of the writeup titled "COVID-19 Epidemic in Mumbai: Long term projections, full economic opening, and containment zones versus contact tracing and testing" [04 Sep 2020, Prahladh Harsha, Sandeep Juneja, Ramprasad Saptharishi]. While the openness of the writeup is appreciable, there is a **fundamental shortcoming** in the writeup, and hence in the policy recommendations, as detailed below. This review also lists **two criticisms** vis-a-vis the writeup's stated goal of "comparing the effectiveness of different non-medical interventions".

## Fundamental Shortcoming: Assuming that Covid is the only concern

The writeup assumes that Covid is the only health concern. What matters for a society is *overall* public health, not only Covid-related health. Consider the following facts:

- Infant mortality in India, even in pre-Corona times, has been an immense problem: with as many as about **2000 infant deaths per day** [link]. Furthermore, Unicef projected in mid-May, that there would be a further **excess 6000 infant deaths/day** around the world, a large share of which is likely to be in India [link]. The causes of these excess deaths include "disruptions in medical supply chains and straining financial and human resources", "curfews and transport disruptions".
- Indeed, ground reports are beginning to emerge, of the devastating effects of such ongoing disruption:
    - "Covid-19 lockdown means 115 million Indian children risk **malnutrition**" [New Scientist, 12 Aug 2020]
    - "Covid-19 Derails Essential Healthcare Services Globally, Says WHO; Sharp Disruptions in India Too" [News18, 31 Aug 2020]
        - See staggering drops in **essential vaccines** such as BCG, Polio, MMR, Rotavirus
        - Also drops in diagnoses of other major killers like **diabetes, cancer, HIV**, etc.
    - "Lockdown hit 9.2 lakh women in need of **abortion services**" [link]
- Excessive Covid focus is resulting in decreased overall health in other countries too: in the UK "for the last 7 weeks in a row, we have had approaching **700 excess deaths** in the private homes that are not related to Covid", [Carl Henegan, 13 Aug 2020]

- Data from NCRB has indicated that **suicides** as a problem is of a similar scale to Covid: there were 1,39,123 suicides in India in 2019 [link]; surely further extending the already long disruption of normalcy, and resulting job losses will only compound this problem.
- Recent data from Mumbai itself suggests that even as the pandemic was at its peak, Mumbai had a larger number of **excess non-covid deaths** than covid-deaths, likely due to lack of access to other essential healthcare [Indian Express 08 Sep].

While there is a mention in the writeup that "social and economic concerns" are "beyond the scope of our simulator", it is but a passing mention well after the list of policy recommendations. Given the above massive scale of lockdown and associated disruption problems, if "social and economic concerns" are outside the scope of the simulation study, policy recommendations should also be outside its scope. If the study cannot balance non-Covid health risks with Covid health risks, it cannot be used by itself for policy recommendations.

The next two criticisms are with respect to the stated goal of the writeup of using the simulator "as a tool for comparing the effectiveness of different non-medical interventions to assist decision making".

# Criticism-1: Pessimistic assumption of vulnerable population

There is growing evidence that the original assumption that all humans are vulnerable to SARS-Cov-2, is very wrong: several people already have immunity, due to prior exposure to related viruses [Sunetra Gupta 17 Aug, Dileep Mavalankar 01 Aug]. This notion of background immunity fits in very well with various observations:

- "80-90% of Family Members of Patients Do Not Contract COVID" [Dileep Mavalankar 01 Aug]
- Ahmedabad has had declining Covid deaths even during the unlock period, with only 17.6% sero-positivity [link]
- Likewise, Delhi has had declining Covid deaths even during the unlock period, with only 15% sero-positivity [link]
- Indeed, measured data from everywhere in the world fits in with the theory that a substantial fraction of the population already has immunity to SARS-Cov-2.

Given this, a simulation which assumes that the entire population is vulnerable is excessively pessimistic. Erring on the side of caution is fine so long as it does not have a cost, i.e if Covid were the only concern. But as stated in the "fundamental shortcoming" above, disruption of normality has huge health and economic costs for a large fraction of Indians and Mumbaikars. Therefore, it would be more reasonable to simulate a range of possibilities here. This also has implications for the next criticism below.

# Criticism-2: Not Exploring Age-Differential Policies

If there is a single defining characteristic of Covid, it is its **age-differential risk**. The risk of hospitalization as well as death decreases exponentially with decreasing age.

The age-differential risk is so much so that several experts have suggested that the “conflict” between “life vs economy” is incorrect: Covid risk minimization, as well as sustained economic activity can be simultaneously achieved by removing restrictions on the young and able, while minimizing risk for the elderly and vulnerable [Raj Bhopal 07 Aug, David Katz 17 Aug].

While it is true that India is a country of mixed-age households, certainly there would be a marked difference in disease progression and spread, in hospital load and deaths, when age-differential policies are considered.

For instance, what if there is no restriction on those under, say, 40 or 50 years of age starting right now, in the month of September ? This, combined with the earlier observation that a large fraction of family members of index patients do not contract Covid, presents an opportunity for policies which simultaneously address Covid risks as well as mitigate the economic and non-Covid health impacts of continued lockdown. Data from Mumbai itself, for “what fraction of family members of index patients contract Covid”, can be used for studying such policies.