PRESS RELEASE - 28th JULY 2020

SARS-CoV2 Sero-prevalence study in Mumbai: NITI-Aayog-BMC-TIFR study

First Round report

A Serological Surveillance for SARS-CoV2 infection was jointly commissioned byNITI-Aayog, Municipal Corporation of Greater Mumbai (MCGM) and the Tata Institute of Fundamental Research (TIFR). This study was carried out in collaboration with the organizations viz. Kasturba Molecular Diagnostic Laboratory, Translational Health Science and Technology Institute (THSTI), A.T.E. Chandra Foundation and IDFC Institute.As a large cross-sectional survey in India, this study aimed to estimate Sero-prevalence in the population based on random sampling methodology from age & gender stratified samples from the general population and Health care workers, and at two time points to infer epidemic spread.

In the first round 6936 samples (out of the estimated 8870) from general population were collected from three wards (R-North, M-West and F-North) in slum and non-slum areas. Participants were recruited following informed voluntary consent. Anti-SARS-CoV2 IgG antibodies was detected using Chemiluminescence assay (CLIA) by Abbott.

Key findings of the study from the general population

Study period: 12-14 days in the first half of July 2020. Participants recruited: 100% of target numbers in slums and 70% in non-slums.

a. Systematically conducted study estimates around 57% Sero-prevalence in slums and 16% sero-prevalence in non-slums, on an average, in the three wards that were studied.
b. Although prevalence in women was marginally higher than men, age wise prevalence in the populations was comparable in these wards.

Interpretations

- Results suggest that asymptomatic infections are likely to be a high proportion of all infections.
- Higher prevalence in slums could be possibly due to population density and shared common facilities (toilets, water points etc.).
- Taking together the current prevalence (estimated here) and records from BMC on reported deaths, the infection fatality rate (IFR) is likely to be very low (0.05-0.10%). Among others, this could be attributed to effective containment efforts and active measures to isolate symptomatic cases by MCGM.
- Lower prevalence in non-slums could be due to better social distancing and access to better hygiene in addition to interventions by MCGM to stem the spread of infection.

- These results will be valuable to learn more about herd immunity. Although it is still unclear what level of prevalence leads to herd immunity, our findings indicate that at least in slums this could be attained sooner than later, if the immunity exists and persists in a significant proportion of the population.

In summary, based on BMC records it seems that unlike the case fatality rate (CFR) (roughly 5-6%), the infection fatality rate (IFR) (0.05-0.10%) in the three wards is lower. Hence, together with relatively low prevalence in the non-slums it suggests that social distancing and related precautions such as wearing masks are effective in slowing the infection spread and should continue as a new normal in all sections of the society independent of prevalence.

Ongoing study/analysis will provide information on (a) presence of neutralizing antibodies (b) risk factors on SARS-CoV2 infection. Planned repeat surveys will provide information about infection spread in both slums and non-slums, and could inform about herd immunity.

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