
Technical paper
COVID 19
Rapid Anti Body Test sero-surveillance -Base line Report-
Kerala



Department of Health & Family Welfare

Government of Kerala

Results of community based sero-surveillance using rapid antibody test among special groups in Kerala - Baseline Report

Background: Sero-surveillance is a tool to assess trends of COVID. Though there are several limitations to rapid antibody tests and the results need to be interpreted cautiously, it can help the policy makers and academicians to examine the trends of population immunity over time, evaluate the impact of preventive measures, identification of groups at risk and inform policy.

Kerala has completed the baseline community based sero- surveillance in the last week of May 2020 using rapid antibody tests. The initial survey would serve as a baseline to determine the seroprevalence of SARS-CoV-2 infection in the community and the subsequent rounds would help to monitor the trends of infection in the community.

The process of conduct of sero-surveillance was a very challenging exercise; it was completed successfully with the efforts of all concerned in planning and implementation. A committee was constituted to evaluate the process and outcome of first round and give recommendations for the next round of sero-surveillance. Committee prepared this report, based on analysis of data, group discussions, e-mail communication, in depth interviews (to verify/triangulate methodology including sampling), document analysis (such as validation process of NIV) and review of literature.

Process: The best available rapid antibody test kits available at that time in terms of accuracy which was quickly validated by NIV (70% sensitivity using 80 samples and 90.5 -100% specificity), as reported by NIV) were used. Samples were collected from 14 districts, from specific groups based on the guidelines issued by Dept of Health and Family Welfare (Table 1).

In regions with low COVID-19 disease prevalence, the risk of false positive results by serologic testing is higher, even with high specificity. As positive predictive value (probability that the person really has the disease, given the test is positive) for antibody-based kits in a low prevalence setting like Kerala was estimated (assumption: 1% prevalence and 98% specificity) prior to the survey to be less than 25% (If anybody is found positive for IgM, less than 25% will actually have true disease), RT-PCR was done for all those tested positive for IgM antibodies.

All those identified during sero-survey who were IgM or IgG positive were brought under surveillance network and were managed appropriately based on existing surveillance and clinical management guidelines.

Results: Analysis is based on data from 9483 individuals in specific groups with varying levels of risk. Based on the algorithm, Infection has been confirmed using RTPCR in thirteen individuals (0.13 %).

The proportion of IgG positivity was high in those groups with exposure such as those in institutional quarantine (19%), home quarantine (6%) and expatriates (5%). If groups with high exposure are eliminated, in other groups, proportion of previous infection (IgG positivity) was between 0.2 to 0.5 %. There is not much difference in evidence of previous infection among health care workers of COVID and non COVID settings (0.5%).

Discussion: The IgG positivity obtained in non-exposed groups were consistent with the ICMR sero surveillance which was conducted in the state during May second week (0.33%).

The sampling method adopted to recruit low risk categories such as the elderly is a matter of concern in interpreting the results. It is only a practical and feasible alternative in the field to include willing persons, during an outbreak situation. The bias which is subsequent to this restricts the generalisability of the results.

Cross reactivity with any corona virus types can lead to false positive results. 4 (out of six) of the corona viruses are commonly circulating common colds. Disproportionally high proportion of elderly and people with ARI tested more among IgM could be due to this cross reactivity also. On RTPCR confirmation, they all turned negative.

Recommendations for conducting future rounds of sero-survey:

- The next round of surveillance can have components of hospital surveillance in antenatal women similar to HIV sentinel surveillance and blood donors.
- Hospital based surveillance has the advantage of minimising risk of exposures to those involved.
- Use of more accurate tests based on IgG ELISA or CLIA shall be considered.
- A sounder methodology to establishment of predictive validity by testing a prospective sample may be considered in validation.
- Groups involving exposures like 3A, 3B, 5C can be avoided and more epidemiological samples may be included.
- The sampling method adopted to recruit persons in the low risk categories such as the elderly may be fine-tuned.

The report has given technical insights regarding conduct of the next round of surveillance. This is a baseline report, will guide to plan the next round.

ICMR is conducting the surveillance round 2 and plans to conduct series of rounds. The state is participating in the ICMR studies for the objectivity and getting comparative analysis of response of all the States and Union Territories.

We appreciate the work done by the following members.

Committee members

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Table 1: Summary of antibody positivity among specific groups

Group	Group description	Total (N)	IgM +	%*	IgG +	%	Both IgM/IgG +	%
1A	HCW COVID	998	18	1.80	5	0.50	1	0.10
1B	HCW Non-COVID hospitals	1020	15	1.47	5	0.49	0	0.00
2A	PFALM*	1003	11	1.10	4	0.40	0	0.00
2B	RDC^	508	8	1.57	1	0.20	0	0.00
2C	Contact with ISD#	240	4	1.67	0	0.00	1	0.42
2D	Guest workers	493	6	1.22	0	0.00	0	0.00
3A	Home quarantine	1561	32	2.05	59	3.78	16	1.02
3B	Institutional Quarantine	405	16	3.95	38	9.38	22	5.43
4	Vulnerable >60 yrs	2019	58	2.87	7	0.35	0	0.00
5A	ARI not COVID suspect	502	14	2.79	1	0.20	1	0.20
5B	Epidemiologic al samples	263	6	2.28	1	0.38	2	0.76
5C	Expatriates, after 14 days	471	9	1.91	12	2.55	3	0.64

***of total IgM positive, those confirmed by RTPCR is 13.**

*PFALM	Police, field health workers, ASHA, AWW, LSGD, Media personnel
^RDC	Workers in ration shops, food and grocery delivery boys, community kitchen
# ISD	Interstate truck drivers