



Kerala HEALTH

89.3% Protected themselves from COVID-19

10.7% got Infected & developed antibodies to COVID-19

**How an empowered community
is fighting COVID-19 pandemic?**

**REPORT OF THE KERALA COVID-19
(SARS CoV-2 IgG) SEROSURVEY**

MARCH, 2021

INDEX

Foreword	3
PART-1 Introduction & Methods	6
Part II- Results	11
Part III- Estimation of Infection	21
Discussion	22
Conclusion	23
Recommendations	24
Acknowledgements	25
References	27
Annexures	29

List of Tables

Table.1 Setting and number of samples in each setting used for analysis.	9
Table.2 Seroprevalence of COVID-19 (SARS CoV-2 IgG) antibodies among adult population of Kerala.	11
Table.3 District wise seroprevalence of COVID-19 (SARS CoV-2 IgG) antibody.	12
Table.4. Seroprevalence of SARS CoV-2 IgG antibodies across age categories.	14
Table.5 Seroprevalence of SARS CoV-2 IgG antibodies across gender categories	15
Table.6 Seroprevalence of SARS CoV-2 IgG antibodies across APL/BPL categories.	16
Table.7 Seroprevalence of SARS CoV-2 IgG antibodies across urban and rural population	17
Table.8 Seropositivity of SARS CoV-2 IgG antibodies among Health Care Workers	18
Table.9 Seropositivity of SARS CoV-2 IgG antibodies among Front Line Workers	19
Table.10 Seropositivity of COVID-19 (SARS CoV-2 IgG) antibodies among residual samples	20

List of Figures

Fig. 1. Seroprevalence of COVID-19 (SARS CoV-2 IgG) antibodies among adult population of Kerala.	11
Fig 2. District wise Lower and Upper bounds of Seroprevalence	13
Fig 3. District wise Seroprevalence & Population Density	13
Fig.4. Seroprevalence of SARS CoV-2 IgG antibodies across age categories.	14
Fig.5 Seroprevalence of SARS CoV-2 IgG antibodies across gender categories.	15
Fig.6 Seroprevalence of SARS CoV-2 IgG antibodies across APL/BPL categories.	16
Fig 7 Seroprevalence of SARS CoV-2 IgG antibodies across urban and rural population	17
Fig.8 Percentage Seropositivity of SARS CoV-2 IgG antibodies among Health Care Workers	18
Fig.9 Seropositivity of SARS CoV-2 IgG antibodies among Front Line Workers	19
Fig.10 Seropositivity of COVID-19 (SARS CoV-2 IgG) antibodies among residual samples	20

Foreword

The COVID 19 pandemic has impacted all the aspects of the way we work and function. It has triggered a wide range of responses from scientific discourse to discussions on various day to day aspects. With the collective work by all, there is scientific information available at the same time there is misinformation pervasive at different levels. This gets tackled only by making scientific information available.

It is decided that the sero surveillance study will be presented in two different ways. One to make a common man to understand the outcomes of their resolute fight against COVID and another to do a scientific publication.

All interventions by Kerala Health for pandemic control and prevention are based on scientific rationale and evidence. At no point these principles are compromised.

For the ease of the reader other than the reader from Medical Science, the following few key questions are put forward

What is a sero surveillance study and why is it done?

The principle adapted is after an infection the body produces antibodies. If the antibodies are identified, it gives information regarding the infections.

Seroprevalence studies will give an idea about disease burden in a community. Such surveys can bring insights into disease transmission and can provide vital inputs to policy decisions for optimizing prevention and control activities.

Why the serological prevalence study is done in Jan – Feb 2021?

Conducting sero surveillance in Jan- Feb in all 14 districts is very valuable to understand whether the efforts taken in the last one year are going in a right direction and giving the desired results or not.

What is the interpretation of Sero-surveillance report?

The study shows that the sero prevalence is 10.76%. It means, state wide around 11% people are having antibodies due to COVID-19 virus. It can be interpreted that the disease was not wide spread.

In other way it reflects that remaining 89% population were following prevention and protection meticulously and keeping themselves protected. These people have demonstrated their resolute fight in spite of adverse situation of high density, sizeable aging population, higher comorbidity population and high mobility. This shows the effectiveness of robust containment measures in Kerala including quarantine, contact tracing, rapid detection of cases through improved access to tests and isolation of COVID positive cases, picking up clusters' formation at the beginning through surveillance and containment measures within clusters and the 'break the chain' measures that were adopted in the state.

The proportion of unidentified cases is much less in Kerala as compared to the national average. Kerala might have identified 1 out of 4 actual cases where as country as a whole might have identified and reported only 1 out of 30 actual cases. This shows the effort the state of Kerala is taking to identify the cases and declare the number transparently in public domain.

What are the implications for future strategy to control the pandemic?

What are the choices for management of COVID-19 pandemic? Allow virus to run through and manage the cases in hospital or put in place the mechanism to reduce the spread of virus through prevention strategies and provide efficient treatment, care and support to the patients. Kerala Health has opted for the second approach.

All credits for lower prevalence of COVID in the state goes to the responsible citizens of the state who followed all COVID protocols rigorously and co-operated with all containment measures. It also implies that, till a significant proportion of citizens are vaccinated,

all citizens shall strictly follow physical distancing by reducing the number of primary contacts, use masks, practice hand hygiene and all shops/establishments/markets shall follow 'COVID compliance.

As number of susceptible individuals are higher, ironically which is due to good containment measures adopted by the state, cases will continue to occur in Kerala. In other places where already a good proportion of citizens have got the disease, the susceptible population to new infections are less.

Kerala at this point of time is epidemiologically the most logical geography to go ahead with massive vaccination drive to contain the epidemic. The strategy of prioritizing the segments and only after completing the prioritized segment in the country, going for the next segment needs a considered re-examination. Such a strategy does not allow an excellent opportunity to do operations research of tackling disease in a different way. It also neutralizes efficiencies in one area because of inefficiencies existing in other parts.

During HIV epidemic the country has gained experience how to conduct surveillance and its use for policy formulation and interventions. Therefore, it is suggested by involving the states and union territories formulating a robust country wide COVID surveillance study should be done. Such surveillance should be conducted periodically, is the way forward for taking evidence-based interventions.

REPORT OF THE KERALA COVID-19 (SARS CoV-2 IgG) SEROSURVEY JANUARY, 2021

PART-1 INTRODUCTION AND METHODS

Kerala had reported the first confirmed case of COVID-19 in India on 30th January 2020¹ that was followed up with a well planned and executed prevention and control strategy that has been ongoing even after one year of the pandemic without complacency. The dividends of this strategy are demonstrable in terms of various indicators of which seroprevalence is an important one.

Seroprevalence studies are required to estimate the disease burden in a community. Such surveys can bring insights into disease epidemiology and can provide vital inputs to policy decisions for optimizing prevention and control activities. Kerala COVID-19 (SARS CoV-2IgG) Serosurvey was planned to measure the level of pre-vaccination exposure of Kerala population to COVID-19.

ICMR, Government of India had conducted three rounds of serosurvey in Kerala during the months of May-June 2020², August-September 2020³ and December 2020⁴. The seroprevalence was 0.3%, 0.8% and 11.6% respectively. These were serial cross-sectional surveys from three districts of Kerala.

The Kerala COVID-19 serosurvey was conducted as per the G.O.(Rt)No.282/2021/H&FWD Dated, Thiruvananthapuram, 01/02/2021. The period of data collection was from 17th February to 28th February 2021.

The primary objective of the serosurvey was to estimate the seroprevalence of SARS CoV-2 IgG antibodies among the adult population of Kerala. The setting of this objective is referred to as community setting.

The secondary objectives of the study were the following:

1. To estimate the seroprevalence of SARS CoV-2 IgG antibodies among specific high-risk groups in Kerala namely Health Care Workers and Frontline Workers.
2. To estimate the seroprevalence of SARS CoV-2 IgG antibodies in residual serum samples in designated laboratories and blood banks.

The study design adopted for estimating the seroprevalence of IgG antibodies to SARS CoV-2 is a cross-sectional one applied on a representative adult population of Kerala. An expected prevalence of 3 % was used for sample size calculation. The following parameters were considered for the sample size estimation: 95% confidence level, a precision of 0.5%, design effect of 2.5 and wastage of 8%. The sampling frame was developed with multistage cluster sampling technique and applying population proportionate to size methods. The 2011 census data was used for preparing the sampling frame. The effective sample size for the primary objective was calculated to be 12100 at the state level.

The study subjects for the community setting (primary objective) was identified with the household in the cluster using the KISH grid method. Those individuals who are not willing to consent for the study, presently active cases in home treatment, persons on quarantine, travellers who have arrived in Kerala within the last 4 weeks and those with contraindication for venepuncture were excluded. Informed consent was obtained followed by collection of basic, sociodemographic and COVID-19 related clinical status and exposures. Data was entered on the online portal developed by the NIC Kerala centre and blood samples were collected, processed to obtaining serum, packed and transported in cold chain to designated laboratories. Serum samples were tested for SARS CoV-2 IgG nucleocapsid antibodies using Abbott Architect

kits which are based on High Throughput Chemiluminescent Microparticle Immunoassay (CMIA) technology. The kit has a sensitivity of 100% (95% CI 95.8%-100% CI) and a specificity of 99.6% (96.5% CI 99.0% - 99.9%)⁵. Since the antibody detected is against the nucleocapsid antigen of SARS CoV-2 virus and the antibody induced by the COVISHIELD vaccine is against the spike protein, vaccination with COVISHIELD would not affect the measurement of seropositivity among the individuals vaccinated with COVISHIELD. The survey was completed before the vaccination program for the prioritised groups in the community with COVISHIELD or COVAXIN had started in Kerala.

The study design adopted for the first and second of the secondary objectives were also cross-sectional designs with sample sizes of 3360 and 4900 respectively. The study subjects for estimating the seroprevalence among the health care workers and front-line workers were also selected using the simple random methods. Informed consent was followed by data collection and blood collection as mentioned above. Residual samples from one selected blood bank and two taluk level laboratories per district were also tested for the presence of SARS CoV-2 IgG nucleocapsid antibodies.

The survey was conducted in all the 14 districts in the state. Training of trainers was done before the start of the survey for the district level field and administrative officers as well as for the designated laboratories. This was followed by district level trainings. Field teams and designated laboratories were requested to register in the online portal and approval was given. Sample IDs were generated once the survey participant details were entered in the portal by the field teams. After processing and testing, the samples were recalled on the portal using the sample IDs for entry of results by the designated laboratories. The results were approved by an "approver login" of the designated lab in charge for validating the result entry.

Data was downloaded from the portal and cleaned. Data analysis was done to obtain the state seroprevalence and district specific seropositivity (seroprevalence). Seropositivity with regard to age category, gender, socioeconomic status and urban and rural areas were also performed. The seropositivity among the Health care workers, front line workers and also among the laboratory residual samples were analysed. The setting and number of samples in each setting used for analysis is given below:

Table.1 Setting and number of samples in each setting used for analysis.

SETTING BASED ON THE OBJECTIVES	EFFECTIVE SAMPLE SIZE	OPERATIONALLY ASSIGNED	ACHIEVEMENT AND NUMBER USED FOR ANALYSIS
COMMUNITY (1 ST OBJECTIVE)	12100	13590	12982
HCW AND FLW (2 ND OBJECTIVE)	3360	3360	3185
RESIDUAL SAMPLES (BLOOD BANK AND TALUK LEVEL LAB) (3 RD OBJECTIVE)	4900	4900	4772
TOTAL	20360	21850	20939

387 individuals were removed from the analysis due to incompatible data in relation to the objectives or poor quality of serum samples.

Hallmarks of the survey

1. Total of 20393 samples were analysed of which 12982 was analysed for estimating seroprevalence at the state level.
2. Application of KISH grid method for selection of individuals from the households enabled the adequate representation of age and gender among the survey participants in the community setting.
3. Real Time data entry with quality assurance systems
4. Validation of community seroprevalence results with residual serum samples results from Blood banks and Taluk level labs

Part II- Results

The total number of samples from the adult population of Kerala in the community setting used for the analysis was 12982. The effective sample size estimated was 12100.

SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) AMONG ADULT POPULATION OF KERALA

The overall seroprevalence of COVID-19 (SARS CoV-2 IgG) antibodies among the adult population of Kerala was found to be 10.76%.

Table.2 Seroprevalence of COVID-19 (SARS CoV-2 IgG) antibodies among adult population of Kerala.

POPULATION	TOTAL SAMPLE S-N	POSITIVE (SARS CoV-2 IgG ANTIBODY)	NEGATIVE	PERCENTAGE (SEROPREVALENCE)	95% CONFIDENCE LIMITS
ADULT POPULATION OF KERALA	12982	1397	11585	10.76%	9.89% 11.64%

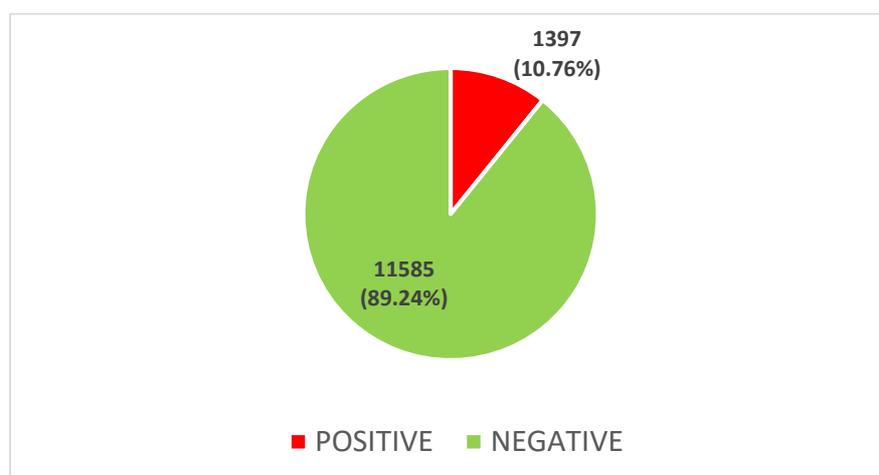


Fig. 1. Seroprevalence of COVID-19 (SARS CoV-2 IgG) antibodies among adult population of Kerala.

1.2 DISTRICT WISE SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES AMONG THE ADULT POPULATION

The seroprevalence (seropositivity) among the 14 districts of Kerala are given in the table below.

Table.3 District wise seroprevalence of COVID-19 (SARS CoV-2 IgG) antibody.

DISTRICT	TOTAL NO. OF SAMPLES (N)	PERCENTAGE OF N	POSITIVE	NEGATIVE	PERCENTAGE POSITIVITY % (95% Confidence Interval)
THIRUVANANTHAPURAM	1200	9.2	150	1050	12.50 (9.5-15.5)
KOLLAM	967	7.4	115	852	11.89 (8.8-15.0)
PATHANAMTHITTA	837	6.4	86	751	10.27 (8.1-12.5)
ALAPPUZHA	751	5.8	113	638	15.04 (11.9-18.1)
KOTTAYAM	683	5.3	66	617	9.66 (5.5-13.9)
IDUKKI	419	3.2	25	394	5.96 (3.9-7.9)
ERNAKULAM	1254	9.7	102	1152	8.13 (6.7-9.6)
THRISSUR	1209	9.3	101	1108	8.35 (5.9-10.9)
MALAPPURAM	1557	12	203	1354	13.03 (9.8-16.2)
PALAKKAD	1035	8	104	931	10.04 (7.7-12.5)
KOZHIKODE	1177	9.1	157	1020	13.33 (10.6-16.1)
WAYANAD	353	2.7	22	331	6.23 (1.5-11.0)
KANNUR	1040	8	99	941	9.51 (6.9-12.0)
KASARAGOD	500	3.9	54	446	10.8 (6.7-14.9)
TOTAL	12982	100	1397	11585	10.76 (9.9-11.6)

Idukki district with lowest population density in inhabited area has comparatively less seroprevalence when compared with other districts. As evidenced in Fig 3, seroprevalence seems to have a relation to the population density of the districts.

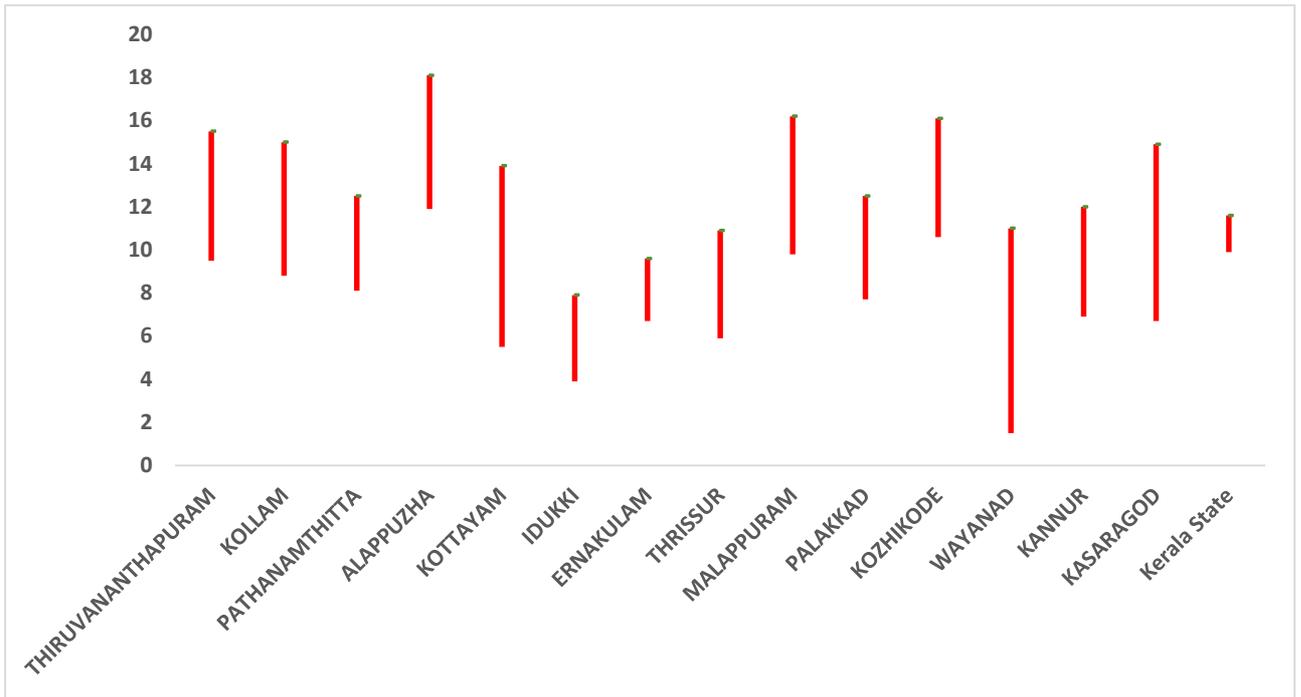


Fig 2. District wise Lower and Upper bounds of Seroprevalence

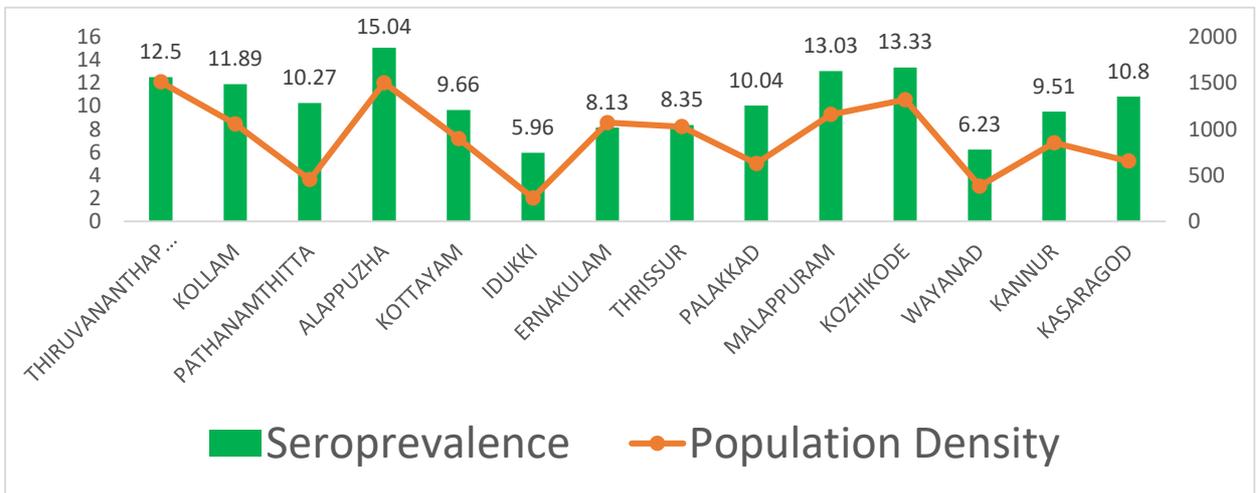


Fig 3. District wise Seroprevalence & Population Density

1.3 SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES ACROSS AGE CATEGORIES

Table.4. Seroprevalence of SARS CoV-2 IgG antibodies across age categories.

AGE CATEGORY	N	PERCENTAGE OF N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPREVALENCE) %
18-20	389	3.0	35	354	9.0
21-30	1571	12.1	170	1401	10.8
31-40	2572	19.8	261	2311	10.1
41-50	3090	23.8	365	2725	11.8
51-60	2726	21.0	309	2417	11.3
61-70	1874	14.4	196	1678	10.5
71-80	638	4.9	52	586	8.2
81 or Above	122	0.9	9	113	7.4
TOTAL	12982	100.0	1397	11585	10.8

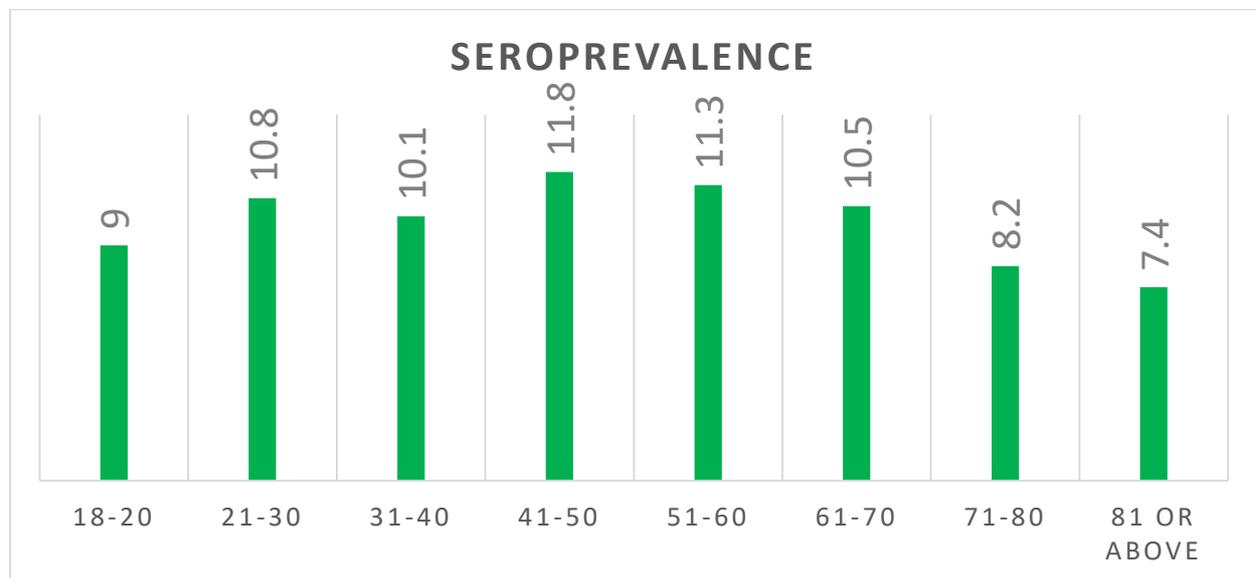


Fig.4. Seroprevalence of SARS CoV-2 IgG antibodies across age categories.

Age categories were adequately represented in the survey. The seroprevalence was relatively low among the elderly above 70 years.

1.4 SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES ACROSS GENDER CATEGORIES

Table.5 Seroprevalence of SARS CoV-2 IgG antibodies across gender categories.

GENDER	TOTAL SAMPLES-N	PERCENTAGE OF N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPREVALENCE) %
MALE	6001	46.2	642	5359	10.7
FEMALE	6981	53.8	755	6226	10.8
TOTAL	12982	100.0	1397	11585	10.8

Both the gender populations are adequately represented in the survey. The seroprevalence was very similar across the genders (Male 10.7%, Female 10.8%).

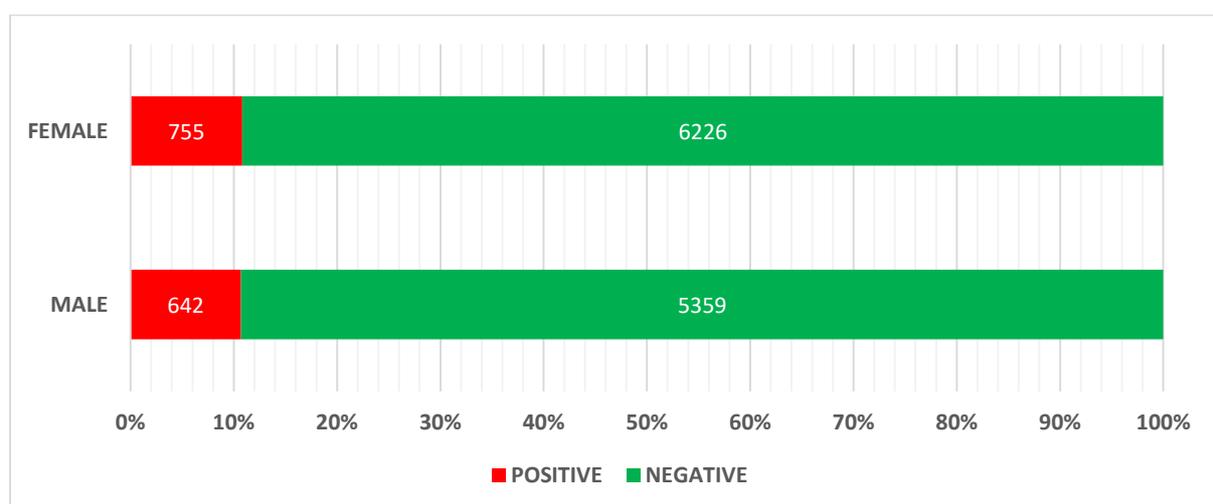


Fig.5 Seroprevalence of SARS CoV-2 IgG antibodies across gender categories.

1.5 SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES ACROSS APL AND BPL CATEGORIES (Above and Below Poverty Line categories)

Table.6 Seroprevalence of SARS CoV-2 IgG antibodies across APL/BPL categories.

APL OR BPL CATEGORY	TOTAL SAMPLE S-N	PERCENTAGE OF N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPREVALENCE) %
APL	7376	56.8	746	6630	10.1
BPL	5606	43.2	651	4955	11.6
TOTAL	12982	100.0	1397	11585	10.8

The APL (above poverty line) and BPL (below poverty line) categories are adequately represented in accordance with general population structure of Kerala.

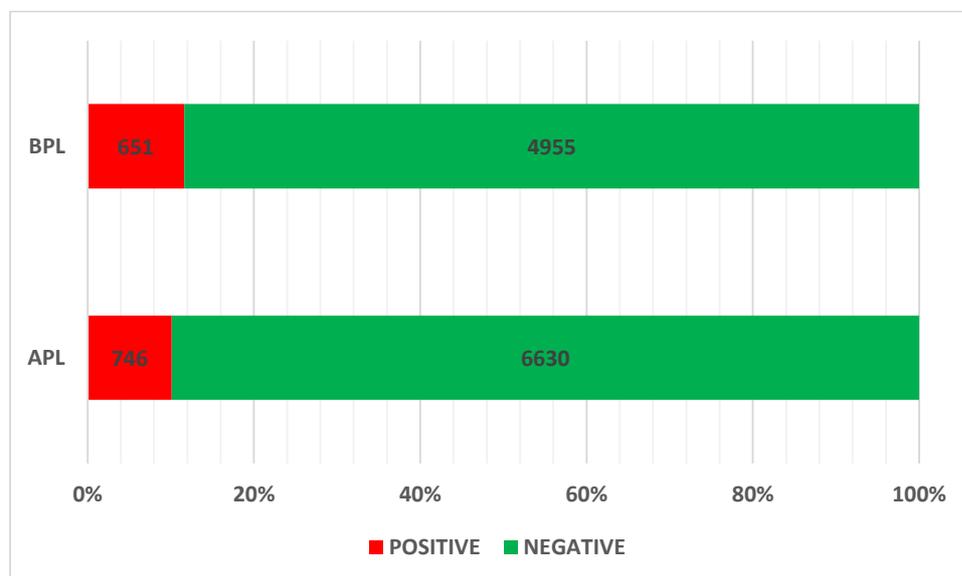


Fig.6 Seroprevalence of SARS CoV-2 IgG antibodies across APL/BPL categories.

1.6 SEROPREVALENCE OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES ACROSS URBAN AND RURAL POPULATION

Table.7 Seroprevalence of SARS CoV-2 IgG antibodies across urban and rural population

TYPE OF LOCAL GOVERNMENT BODY	TOTAL SAMPLES-N	PERCENTAGE OF N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPREVALENCE) %
CORPORATION (URBAN)	1163	8.95%	151	1012	12.98
MUNICIPALITY (URBAN)	4944	38.08%	587	4357	11.87
PANCHAYATH (RURAL)	6875	52.95%	659	6216	9.59
TOTAL	12982	100.00%	1397	11585	10.76

The seroprevalence was relatively lower in the rural areas (9.59) when compared to urban areas.

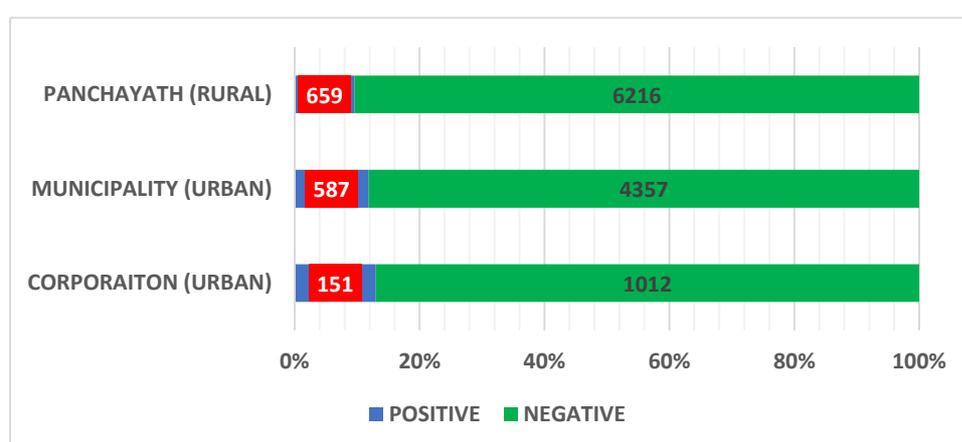


Fig.7 Seroprevalence of SARS CoV-2 IgG antibodies across urban and rural population

2. SEROPOSITIVITY OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES AMONG HEALTH CARE WORKERS AND FRONT-LINE WORKERS IN KERALA

2.1 SEROPOSITIVITY OF COVID-19 (SARS CoV-2 IgG) ANTIBODIES AMONG HEALTH CARE WORKERS

The seropositivity of COVID-19 (SARS CoV-2) antibodies among the Health care worker population is as follows.

Table.8 Seropositivity of SARS CoV-2 IgG antibodies among Health Care Workers

SETTING/RISK GROUP	TOTAL SAMPLES-N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPOSITIVITY) %
HEALTH CARE WORKERS	1562	164	1398	10.5 (8.9-12.1)

The seropositivity among the Health Care Workers in Kerala was 10.5%. This included all the levels of health care and all categories of Health care providers. The seropositivity is similar to that of the population in the community.

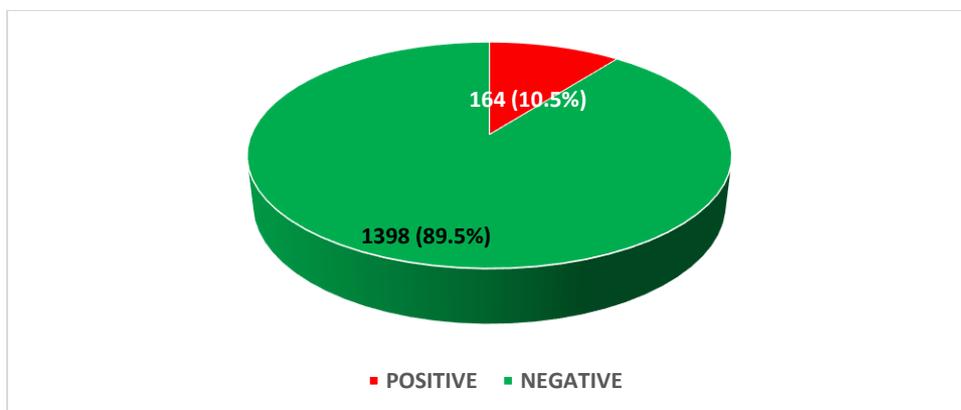


Fig.8 Percentage Seropositivity of SARS CoV-2 IgG antibodies among Health Care Workers

2.2 SEROPOSITIVITY OF COVID-19 (SARS CoV-2 IgG) ANTOBODIES AMONG FRONT LINE WORKERS

Table.9 Seropositivity of SARS CoV-2 IgG antibodies among Front Line Workers

SETTING/RISK GROUP	TOTAL SAMPLES -N	POSITIVE	NEGATIVE	PERCENTAGE (SEROPOSITIVITY) % (95% Confidence Interval)
POLICE PERSONNEL	790	121	669	15.3 (11.7-18.9)
LSG PERSONNEL	833	73	760	8.8 (6.3-11.2)
TOTAL (FRONT LINE WORKERS)	1623	194	1429	12.0

The overall seropositivity among the front-line workers was 12.0%.

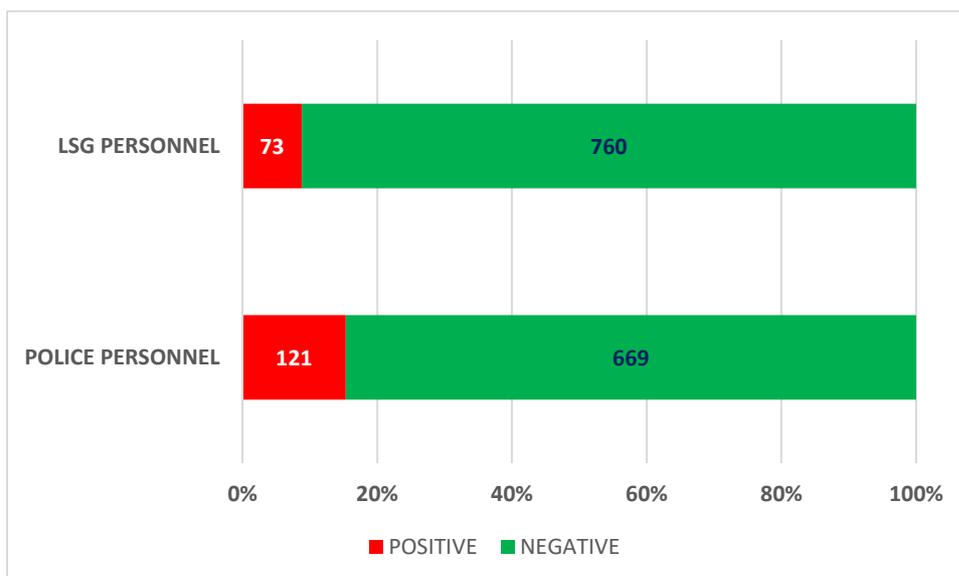


Fig.9 Seropositivity of SARS CoV-2 IgG antibodies among Front Line Workers

2.3 SEROPOSITIVITY AMONG LABORATORY RESIDUAL SAMPLES

Table.10 Seropositivity of COVID-19 (SARS CoV-2 IgG) antibodies among residual samples

SETTING	TOTAL SAMPLES-N	POSITIVES	NEGATIVES	PERCENTAGE (SEROPREVALENCE) % (95% Confidence Interval)
BLOOD BANK	1919	212	1707	11.0 (9.3 – 12.8)
TALUK LEVEL LAB	2853	347	2506	12.2 (10.6-13.8)
TOTAL	4772	559	4213	11.7

The residuals samples may be considered as a proxy indicator for the seroprevalence in the community. The results are consistent with the seroprevalence form randomly selected samples from the community



Fig.9 Seropositivity of COVID-19 (SARS CoV-2 IgG) antibodies among residual samples

PART-3

ESTIMATION OF INFECTIONS IN THE POPULATION

3. INFECTION TO CASE RATIO.

The seroprevalence of 10.76% found in the study when extrapolated to estimate the burden of infection in Kerala's projected population of the year 2020 (35,307,000) gives the number of infected people as 3799033. The number of reported cases in Kerala two weeks prior to the start of the survey (02.02.2021) was 938353⁶. This denoted a case to infection ratio of approximately 1:4. This is an indicator of the COVID-19 testing and detection capability of the state.

For every 4 cases that occurred in the community, one case is being picked up in Kerala. Taking National average, only for every 30 cases in the community, one case is being picked up. This demonstrates the robust efforts for testing and isolating COVID-19 cases in Kerala

PART-4

4.1 DISCUSSION

The seroprevalence of SARS CoV-2 IgG antibody among the adult population of Kerala is 10.8%. This is relatively low in comparison with reports on seroprevalence from other countries, other states in India as well as India's overall seroprevalence. The serosurvey results show that approximately 89 % of the population in Kerala are vulnerable and are still at risk of getting infected. Though there is a possibility of the antibodies weaning off with time (seroreversion), the fact that Kerala's peak was during the month of October 2020 and since, and as the survey was conducted within 4 months after the peak, the contribution of seroreversion may be considered to be less. Studies have reported that antibodies against SARS CoV-2 did not decline within four months after diagnosis⁷. The launch of the vaccination campaign in March 2021 for the prioritised groups in the community comes at the best possible time for Kerala as it was able to keep the population protected from exposure to the pandemic till then through simple preventive messages like wearing masks, keeping safe distancing and frequent hand washing along with other control measures. This has also reflected in the case fatality rate (0.4%) which is also one of the lowest in the country⁹.

The risk of positivity and thereby infection was significantly less among persons aged 71 or more indicating the effectiveness of reverse quarantine measures and other measures taken to protect the vulnerable population and have benefited from it.

The seropositivity among the HCW was similar to that in the adult population in community setting. This may be attributed to the effectiveness of hospital infection control measures, capacity building of health care workers, adherence to PPE measures etc among many other factors.

Police personnel in the Front-Line Worker (FLW) category seems to have a comparatively higher seropositivity.

The seropositivity among the residual serum samples are a proxy indicator of the seroprevalence in the community. There is coherence of positivity between the residual serum samples and the community samples.

4.2 STRENGTHS

1. Adequate sample size of the survey with application of KISH grid method for selection of individuals from the households enabled the adequate representation of age and gender among the survey participants in the community setting.
2. All the districts in the state were covered in the survey.
3. Data triangulation with residual serum samples from Blood banks and Taluk level labs are similar to the results of the samples from the adults more than 18 years in the community setting thereby providing validity to the survey.
4. Influence of COVID vaccination has not affected the measurement of antibodies as it was completed before the vaccination of priority groups in the community with either of the available vaccines (COVISHIELD, COVAXIN)

4.3 CONCLUSION

1. The seroprevalence of SARS CoV-2 IgG antibody among the adult population of Kerala is 10.8%. This is relatively low in comparison with reports from other states in India and the country as a whole⁴.

2. Persons aged above 70 years showed less risk of seropositivity thereby reflecting the effectiveness of reverse quarantine measures the state has initiated for protecting the vulnerable population.
3. The seroprevalence of SARS CoV-2 IgG antibody among the healthcare workers in Kerala is 10.5%. This is similar to the adult population of Kerala. Hospital Infection control measures and capacity building among other factors may have contributed to this comparatively low prevalence among the health care workers in the state.
4. The overall seroprevalence of SARS CoV-2 IgG antibody among the front-line workers was 12.0%.
5. The overall seroprevalence of SARS CoV-2 IgG antibody among the residual samples was 11.7%. This is in coherence with the seroprevalence in the adult population of Kerala.
6. The case to infection ratio of 1:4 supports the robust efforts put by the system to test and find out maximum cases.

4.4 RECOMMENDATIONS

1. Escalate the COVID-19 vaccination coverage in the state at the earliest to achieve a faster rate of population immunity. Vaccination for 18–60-year population is justified along with vaccinating the priority groups in the state.
2. Continue the COVID-19 appropriate behaviour in the population without complacency.
3. Reverse quarantine of elderly population needs to go with same vigour to safeguard them against the pandemic.
4. Frontline workers including police personnel need to take additional precautions for preventing transmission.
5. Serial serosurveys may be performed to assess the progression of population immunity.

Acknowledgement

Kerala Health is taking evidence-based interventions for tackling COVID pandemic. The Genome sequencing and Sero Surveillance studies are the most important studies to give insights regarding the pandemic situation. The department has taken up both these studies. The sero surveillance study was completed and the report is published. This report will corroborate regarding the strategies developed, interventions planned and implemented at the field level are successful and giving results of containment of the epidemic. It is our effort that scientific reports should not remain in the confines of the experts and health fraternity but it should also percolate down to the people. Because this is the demonstration of resolute fight put up by PEOPLE by following guidelines, taking prevention and protection measures. The very fact that the antibody prevalence is less in elderly people having age 70 years or above is a remarkable success of 'reverse quarantine' strategy planned and implemented as early as in Feb 2020.

We appreciate the contribution of State Medical Board, Prevention of Epidemic and Infectious Disease Cells, Public Health Division of DHS for designing the study, building capacities of the teams at the field level functionaries through the respective District teams and laboratories. The output clearly demonstrates the team work put in by all at the field level, laboratories, district management unit and the State management unit.

The work of such a magnitude is done collectively. However, to coordinate and get things moved require continuous efforts. We acknowledge the sincere efforts of Dr Tony Lawrence, Dr Rakesh P S, Dr Indu P S, Dr Meenakshy V, Dr Zinia T Nujum, Dr Aparna Mohan and others.

We appreciate the follow up and logistic support for test kits, consumables and machines provided by Dr Dileep GM KMSCL and Shir Ajay MD KMSCL and their team.

The field teams are continuously working in various activities to control and contain the pandemic. It was possible to conduct such an important study only because of the wholehearted efforts and coordinated actions by the field teams. We sincerely appreciate their efforts.

The support extended by the institution heads, department heads, laboratory heads has facilitated this study. We look forward to more research studies by Post Graduate students, Under Graduate students, faculties and field functionaries to improve the health system response to the COVID pandemic.

Dr Rajan Khobragade
Principal Secretary
Health & Family Welfare
Government of Kerala
Thiruvananthapuram

4.5 REFERENCES

1. Andrews MA, Areekal B, Rajesh KR, Krishnan J, Suryakala R, Krishnan B, et al. First confirmed case of COVID-19 infection in India: A case report. *Indian Journal of Medical Research* [Internet]. 2020 May 1 [cited 2021 Mar 16];151(5):490. Available from: <https://www.ijmr.org.in/article.asp?issn=0971-5916;year=2020;volume=151;issue=5;spage=490;epage=492;aulast=Andrews;type=0>
2. Murhekar M, Bhatnagar T, Selvaraju S, Rade K, Saravanakumar V, Vivian Thangaraj J, et al. Prevalence of SARS-CoV-2 infection in India: Findings from the national serosurvey, May-June 2020. *Indian Journal of Medical Research* [Internet]. 2020 [cited 2021 Jan 12];152(1):48. Available from: <http://www.ijmr.org.in/text.asp?2020/152/1/48/294807>
3. Murhekar MV, Bhatnagar T, Selvaraju S, Saravanakumar V, Thangaraj JWV, Shah N, et al. SARS-CoV-2 antibody seroprevalence in India, August–September, 2020: findings from the second nationwide household serosurvey. *The Lancet Global Health* [Internet]. 2021 Mar 1 [cited 2021 Mar 17];9(3):e257–66. Available from: <https://www.sciencedirect.com/science/article/pii/S2214109X20305441>
4. Technical-Paper-COVID-19-ICMR-Sero-Surveillance-Study.docx.pdf [Internet]. [cited 2021 Mar 16]. Available from: <https://dhs.kerala.gov.in/wp-content/uploads/2020/10/Technical-Paper-COVID-19-ICMR-Sero-Surveillance-Study.docx.pdf>
5. Health C for D and R. EUA Authorized Serology Test Performance. FDA [Internet]. 2021 Jan 8 [cited 2021 Mar 13]; Available from: <https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/eua-authorized-serology-test-performance>
6. Bulletin-HFWD-English-February-02.pdf [Internet]. [cited 2021 Mar 16]. Available from: <https://dhs.kerala.gov.in/wp-content/uploads/2021/02/Bulletin-HFWD-English-February-02.pdf>
7. Gudbjartsson DF, Norddahl GL, Melsted P, Gunnarsdottir K, Holm H, Eythorsson E, et al. Humoral Immune Response to SARS-CoV-2 in Iceland. *N Engl J Med*. 2020 Oct 29;383(18):1724–34.
8. Wajnberg A, Amanat F, Firpo A, Altman DR, Bailey MJ, Mansour M, et al. Robust neutralizing antibodies to SARS-CoV-2 infection persist for months. *Science* [Internet]. 2020 Dec 4 [cited 2021 Mar 17];370(6521):1227–30. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7810037/>

9. CFR :: Integrated Disease Surveillance Programme(IDSP), NCDC [Internet]. [cited 2021 Mar 16]. Available from: <https://www.ncdc.gov.in/Mortality/CFR.html>

ANNEXURE-1 Kerala COVID -19 SEROSURVEY TEAMS

ANNEXURE-2. Kerala COVID-19 (SARS CoV-2 IgG) SEROPREVALENCE Study, G.O.(Rt)No.282/2021/H&FWD Dated, Thiruvananthapuram, 01/02/2021

Annexure-1

KERALA COVID-19 SEROSURVEY JANUARY 2021- DATA COLLECTION TEAMS		
ALAPPUZHA DISTRICT		
SL.NO	NAME OF TEAM	NODAL OFFICER
1	FHC KALAVOOR ALAPPUZHA	DR SAFEER
2	FIELD DATA COLLECTION TEAM 3 ALAPPUZHA	DR VIPIN K RAVI
3	FIELD DATA COLLECTION TEAM 2 ALAPPUZHA	DR VIPIN K RAVI
4	FIELD DATA COLLECTION TEAM 1 ALAPPUZHA	DR VIPIN K RAVI
5	DMO H MAIN TEAM	DR VIPIN K RAVI
6	G H ALAPPUZHA	DR VIPIN K RAVI
7	THQH KAYAMKULAM, ALAPPUZHA	DR L.MANOJ
8	THQH LABORATORY CHERTHALA ALAPPUZHA	DR.ANILKUMAR.N
9	W&C HOSPITAL ALAPPUZHA	DR.ASA.K.K
10	GENERAL HOSPITAL ALAPPUZHA,ALAPPUZHA	DR.DEEPUS
11	PHC VENMONY	DR ANU ASOKAN
12	THQH, CHERTHALA,ALAPPUZHA	DR.ANILKUMAR.N
13	PHC THAZHAKARA ALAPPUZHA	DR MANU MURALEEDHARAN
14	CHC AROOKUTTY ALAPPUZHA	DR.SETHU MADHAVAN
15	FHC ARATTUPUZHA	DR NOOPURA
16	PHC CHEPPAD	DR AKHIL.G.G
17	PHC PUNNAPRA SOUTH	DR. POORNIMA T.A.
18	CHC VELIYANAD	DR. ANILKUMAR S
19	PHC PALLIPAD	DR. SUNIL
20	PHC CHERUTHANA	DR.PRIYA PV
21	KAVALAM PRIMARY HEALTH CENTER	NITHUN KABEER
22	CHC MUTHUKULAM	DR.THANUJA S
23	FHC KANDALLOOR ALAPPUZHA	DR VIDHYA S NAIR
24	FHC VEEYAPURAM ALAPPUZHA	DR. EJAZ MUHAMMAD KHAN
25	FAMILY HEALTH CENTRE PURAKKAD ALAPPUZHA	DR. PREETHI.P.T
26	PHC AMBALAPPUZHA NORTH ALAPPUZHA	DR GOPAKUMAR VV
27	PHC KODAMTHURUTH	DR.RENJITH MONAI CHELLAPPAN
28	FAMILY HEALTH CENTRE KANJIKUZH ALAPPUZHA	DR SAJILA S PILLAI
29	PHC PATHIYOOR ALAPPUZHA	DIVYA JAYARAM DAS
30	PRIMARY HEALTH CENTER THAMARAKULAM ALAPPUZHA	DR ELVIN JOSE
31	RHTC CHETTIKAD ALAPPUZHA	DR. REMYA
32	PHC RAMANKARY ALAPPUZHA	DR.VINOD P

33	TALUK HEAD QUARTERS HOSPITAL LABORATORY HARIPAD	DR.KRISHNA KUMAR.G
34	DISTRICT PUBLIC HEALTH LABORATORY ALAPPUZHA	DR SOUMYA VASUDEVAN
ERNAKULAM DISTRICT		
SL.NO	NAME OF TEAM	NODAL OFFICER
1	DISTRICT HOSPITAL ALUVA ERNAKULAM	AARATI KRISHNAN
2	GH MUVATTUPUZHA ERNAKULAM	DR.SALI KURIEN
3	CHC KEECHERI ERNAKULAM	DR SEENA N S
4	CHC EDAPPALLY ERNAKULAM	DR.KISHORE
5	CHC PALLARIMANGALAM	DR.ASISH B
6	PHC PINDIMANA ERNAKULAM	DR.DIVYA RAJENDRAN
7	PHC EDATHALA ERNAKULAM	DR.SREEREKHA
8	CHC KOOTHATTUKULAM ERNAKULAM	DR.NIKITHA
9	THQH PARAVUR ERNAKULAM	DR.VINEETHA PRAMOD
10	BLOOD BANK GH ERNAKULAM	DR MEENA BEEBI
11	MOBILE TEAM DMO ERNAKULAM	DR SREEDEVI S
12	THQH THRI PUNNITHURA ERNAKULAM	DR.POORNIMA
13	TH PALLURUTHY	DR JOSEPH
14	TALUK HOSPITAL PUTHENVELIKKARA, ERNAKULAM	DR.XINAMARY
15	PHCMARADY ERNAKULAM	DR. AMARLAL. K
16	PHC MANEED ERNAKULAM	DR VIPIN MOHAN T M
17	URBAN FAMILY HEALTH CENTRE THAMMANAM	DR.SAFIYA BEEVI K.A.
18	UPHC VENNALA ERNAKULAM	DR ANITHA C B
19	PHC PIZHALA	DR MANO AUGUSTINE C
20	UPHC KUTHAPADY	DR.ARJUN NARAYANAN
21	THQH KOTHAMANGALAM, ERNAKULAM	DR.ANJALI N.U
22	W&C MATTANCHERY ERNAKULAM	DR SMIJI GEORGE
23	FHC KUTTAMPUZHA	DR ANOOP THULASI
24	GH ERNAKULAM	DR VIJAYAN
25	PHC KALAMASSERY	DR NAZEER
26	UPHC KADAVANTHRA	DR.SARINA MATHEWS
27	UPHC PANDIKUDY	SREEPRIYA J
28	COMMUNITY HEALTH CENTRE, KALADY	DR PUSHPA V V
29	FHC ELANJI	DR MOHANDAS TK
30	PHC KUMARAPURAM	DR. SUNITHA KUMAR.I.S
31	UPHC EDAKOCHI	ARUN.R
32	PHC ELOOR ERNAKULAM	VICTOR JOSEPH CORREYA

33	PHC NEDUMBASSERY	DR. BETTY ANTONY
34	FHC ALANGAD	MURALEEDHARAN PILLAI T A
35	UPHC CHAMPAKKARA	DR BOBBY ABRAHAM
36	URBAN PRIMARY HEALTH CENTRE	DR. VANAJAKUMARI E.K
37	UPHC CHALIKKAVATTOM	DR.SUCHETHA JAGAN
38	GH MUVATTUPUZHA EKM	SALI KURIAN
39	PRIMARY HEALTH CENTRE KOONAMMAVU	DR NEETHU V P
40	TH ANGAMALY	DR.BINDU K B
41	COMMUNITY HEALTH CENTRE, KALADY	DR PUSHPA V V
42	LABORATORY FHC THURAVOOR ERNAKULAM	DR. ARUN B KRISHNA
43	THQH PERUMBAVOOR,ERNAKULAM	DR CIJO KUNJACHAN
44	FHC,NERIAMANGALAM	DR.LUCINA JOSEPH
45	FHC MUNAMBAM	SHINIL K B
46	PHC UDAYAMPEROOR ERNAKULAM	DR.SHEEJA B
47	DISTRICT HOSPITAL ALUVA	DR PRASANNAKUMARI
48	FHC, PAIPRA, ERNAKULAM	DR. KRISHNAPRIYA S L
49	THQH PERUMBAVOOR,ERNAKULAM	DR CIJO KUNJACHAN
50	THRIKKAKARA MUNICIPALITY	DR PIUGNA
51	FHC CHELLANAM ERNAKULAM	DR.REMYA G KRISHNAN
52	CHC VENGOOR, ERNAKULAM	DR SAINABA E

IDUKKI DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	THQH NDKM	DR. ANOOP K
2	THALUK HOSPITAL ADIMALI	DR.BRIJU RAMANKUTTY
3	TALUK HEAD QUARTERS HOSPITAL PEERMADE	DR JITHIN M ANTONY
4	CHC KARUNAPURAM	DR JYOTHISH KUTTAPPAN
5	BLOCK PHC PAMPADUMPARA	DR BIJU PHILIP
6	FHC KANCHIYAR	DR.EVIN ABRAHAM
7	TH KATTAPPANA	DR.ANU SEBASTIAN
8	FHC KAMAKSHY IDUKKI	DR DIVYA VENUGOPAL
9	CHC DEVIKULAM	ASWATHY VISWAM S
10	DH THODUPUZHA	DR.MAYA RAJ
11	CHC RAJAKKAD	DR. JOBIN JOSE
12	CHC MUTTOM	DR LINI ANN JOSE
13	DISTRICT HOSPITAL IDUKKI	DR.SURESHVARGHESE
14	CHC CHITHIRAPURAM	DR. SURESH
15	CHC VANDIPERIYAR	DR.VENKET LAKSHMI.S

KANNUR DISTRICT		
SL.NO	NAME OF TEAM	NODAL OFFICER
1	UPHC KOLASSERY	DR.NEETHA S
2	MAYYIL CHC	DR KARTHYAYANI
3	PHC CHITTARIPARAMBA	DR ANU PK
4	PHC CHENGALAYI KANNUR	DR.SHAKKIR MOHAMMED
5	GMC, KANNUR	DR. A. K. JAYASREE
6	FHC KADIRUR	DR.SAHINA.A.K
7	FHC KANKOL	OMKARNATH
8	FHC THILLENKERY	DR. CHASMA K
9	TALUK HOSPITAL, PERINGOME, KANNUR	DR. SUNITHA NANDAN
10	CHC IRIVERY KANNUR	MAYA K
11	THQH TALIPARAMBA	SURESH BABU C V
12	BLOOD BANK DH KANNUR	DR. SHAHEEDA.
13	PHC PALLIKUNNU	DR.RAJESWARI RAJ
14	PHC CHERUKUNNU PUNNACHERY	DR AMULYA BHARGAVAN
15	CHC KOOTUMUGHAM KANNUR	VIVEK CHANDRAN
16	FHC CHERUKUNNU THARA	DR. VASU ANAND
17	TH PAYANGADI, KANNUR	KHADEEJA BEEBI M T C
18	TH IRITTY KANNUR	DR.P P REVEENDRAN
19	CHC PAPPINISSERY	ANEESH BABU
20	TALK HOSPITAL KOOOTHUPARAMBA	DR SHIJI E JOB
21	PHC KADACHIRA KANNUR	DR SHAMEEM P
22	FHC THERTHALLY	DR BINCY JOSEPH
23	TALUK HOSPITAL KUTHUPARAMBA	DR SHIJI E JOB
24	TALUK HOSPITAL KUTHUPARAMBA	DR SHIJI E JOB
25	FHC MATTOOL KANNUR	DR.ANOOP CO
26	CHC ODUVALLITHATTU	DR.SNEHALATHA POLA
27	PHC EZHOME	MINI SREEDHARAN
28	THQH TALIPARAMBA KANNUR	DR REKHA K T
29	IRIKKUR	DR. .MANU MATHEW
30	PHC ULIKKAL KANNUR	RANJITH MATHEW
31	FHC MALAPPATTAM KANNUR	DR REMYA K N
32	KALLIASSERY FHC KANNUR	DR BHAVANA RAMESH
33	FHC VALAPATTANAM KANNUR	DR JUMJUMI P A
34	FHC KOTTIYOOR	DR SARUN GHOSH
35	PHC CHOKLI, KANNUR	DR.AMRUTHAKALA N

36	REGIONAL PUBLIC HEALTH LABORATORY KANNUR	DR.LEENA.P
37	PHC PANNIYANNUR KANNUR	ATHULYA A
38	D H KANNUR LABORATORY	DR AKHIL R
39	DISTRICT HOSPITAL KANNUR	DR AKHIL R
40	CHC PINARAYI	DR. SHYNA VP
KASARAGOD DISTRICT		
SL.NO	NAME OF TEAM	NODAL OFFICER
1	TALUK HOSPITAL NILESWAR	DR. SURESHAN V
2	CHC MULIYAR	DR REKHA
3	PHC ADOOR	SURESH KUMAR
4	CHC PERIYE	DR RAJAMOCHANAN T A
5	DISTRICT HOSPITAL KANHANGAD, KASARGOD	DR.SHAKEEL ANWAR
6	PHC OLAT	DR.BLESSSOM THOMAS
7	PHC MADIKAI	DR.MARK JACOB
8	CHC BADIADKA2	DR.SATHYASANKARA BHAT
9	FHC PADNE	DR AMBILI JANARDHANAN
10	FHC CHATTANCHAL	DR.KAYINHLCM
13	TALUK HEAD QUARTERS HOSPITAL NILESHWAR	DR.V SURESHAN
15	FHC UDUMBUNTHALA	DR SAHAD BIN USMAN
16	FHC VALIYAPARAMBA	MEDICAL OFFICER
17	FHC NARKILAKKAD	MEDICAL OFFICER
18	PHC VELLARIKUND	DR RAJA SREE S S
19	FHC MULLERIA KASARGOD	DR. ANU SIXTUS
20	THQH MANGALPADY	DR.CHANDRAMOHANAN E V
21	TALUK HEAD QUARTERS BEDADKA, KASARGOD	AMOOLYA M T
22	PHC PALLIKKARE	DR BINI MOHAN
23	THQH MANGALPADY	DR NISHA K
24	CHC CHERUVATHUR	DR RAMESH DG
25	DH LAB KANHANAGAD	DR.APARNA
26	FHC VORKADY, KASARAGOD	TITTU G ZACHARIAH
27	CHC BADIADKA, KASARAGOD	DR.SATHYASANKARA BHAT
28	FHC ENAAPPARA, KASARAGOD	DR. FATHIMA
29	FHC KARINDALAM KASARAGOD	JISHA
30	GENERAL HOSPITAL, KASARAGOD	DR APARNA B

31	GENERAL HOSPITAL KASARGOD	DR NAIR SAUMYA GOPINATHAN
32	FHC PERLA KASARAGOD	DR DEEPARAJ R K
KOLLAM DISTRICT		
SL.NO	NAME OF TEAM	NODAL OFFICER
1	CHC NEDUMONCAVU	SUNITHA SIVADAS
2	FHC PALATHARA KOLLAM	DR.NADASHA
3	CHC SOORANADUNORTH KOLLAM	DR.SHYLA MATHEWS
4	PHC YEROOR KOLLAM	DR BIJI B RAJ
5	CHC NILAMEL KOLLAM	DR.SASI K
6	UPHC KARUNAGAPPALLY TEAM 3	DR.THOMAS ALPHONSE
7	UPHC KARUNAGAPPALLY TEAM 2 KOLLAM	DR.THOMAS ALPHONSE
8	UPHCKARUNAGAPPALLY TEAM 1,KOLLAM	DR.THOMAS ALPHONSE
9	UPHC KARUNAGAPPALLY 3,KOLLAM	DR.THOMAS ALPHONSE
10	UPHC KARUNAGAPPALLY 2	DR.THOMAS ALPHONSE
11	UPHC KARUNAGAPPALLY 1	DR.THOMAS ALPHONS
12	CHC THEKKUMBHAGOM KOLLAM	DR.ANOOP.V.S
13	PHC YEROOR KOLLAM	DR. BIJI B RAJ
14	CHC ANCHAL KOLLAM	DR SHAMEER
15	CHC THRIKKADAVOOR,KOLLAM	DR.LESITHA.T
16	THQH KARUNAGAPPALLY KOLLAM	DR.SUJITH VIDYADHARAN
17	CHC THRIKKADAVOOR	DR.LESITHA.T
18	PHC KILIKOLLOOR	DR.SEEMA SIVANAND
19	FHCVELIYAM KOLLAM	DIVYA SASI
20	THQH KOTTARAKKARA	DR MEREENA
21	FHC VILAKKUDY, KOLLAM	DR ANEESH
22	UPHCKARUNAGAPPALLYKOLLAM	DR. THOMAS ALPHONS
23	UPHC KARUNAGAPALLY	DR THOMAS ALPHONSE
24	UPHC KARUNAGAPPALLY	DR.BYJU
25	UPHC MUNDAKKAL	DR.NAYANA VIJAYAN
26	PHC THALACHIRA,KOLLAM	DR.K R SANTHOSH KUMAR
27	FHC THAZHAVA KOLLAM	DR JASMIN
28	PHC PIRAVANTHOOR	DR SANDHYA SUDHAKAR
29	PHCTHODIYOOR.KOLLAM	SEMEENA
30	PRIMARY HEALTH CENTRE	DR ANJANA BABU R
31	FHC CHATHANNOOR	DR VINOD
32	CHC CHAVARA KOLLAM	SHAJI K
33	PHC PERINAD KOLLAM	DR JUNU V
34	PHC CHIRAKKARA KOLLAM	NAMITA NAZEER
35	FHC ALAPPAD KOLLAM	MERCY WILLIAMS

36	FHC SAKTHIKULANGARA KOLLAM	DR SHEEBA
37	UPHC VADDY KOLLAM	DR. NISHMA JOHN
38	FHC SAKTHIKULANGARA KOLLAM	DR SHEEBA
39	PHC ERAVIPURAM KOLLAM	DR RAJESH D KAMALAN
40	MOBILE MEDICAL SURVEILLANCE UNIT 2 KOLLAM	DR TIMMY GEORGE RODRIGUEZ
41	URBAN PHC ULIAKOVIL	DR RAMYA A
42	MOBILE MEDICAL SURVEILLANCE UNIT 1 KOLLAM	DR JOHN MATHEW
43	PHC THEVALAKKARA,KOLLAM	DR.ANUPAMA
44	CKM FHC MAYYANAD(KOLLAM)	DR.SALILA DEVI.P.R
45	PRIMARY HEALTH CENTRE KUNNATHOOR	DR MUHAMMED SHAFI
46	CHC NEDUMPANA KOLLAM	DR.ANISH P I
47	FHC THENMALA KOLLAM	DR RESMI. R. U
48	DISTRICT PUBLIC HEALTH LAB KOLLAM	DR CIJI JOSE P
49	PRIMARY HEALTH CENTRE ALAYAMON	DR ANOOP NAIR
50	FHC NEDUVATHUR KOLLAM	DR LEKSHMI KRISHNAN
51	PHC SOORANAD SOUTH	DR SREELEKSHMI S
52	BLOOD BANK,PUNALUR TALUK HEAD QUARTERS HOSPITAL	DR.LEKSHMI
53	FHC VALLIKKAVU,KOLLAM	DR.SREEKALA
54	DISTRICT HOSPITAL KOLLAM	DR LEKSHMI
55	PHC THRIKKARUVA KOLLAM	DR. PARVATHY JAYAPAL
56	FHC NEDUVATHUR	DR LEKSHMI KRISHNAN
57	PHC ADICHANALLOOR	VEENA RAJ

KOTTAYAM DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	MCH KOTTAYAM	DR.SITHARA
2	FHC ERATTUPETTA	DR.SREEJITH VIJAYAN
3	FHC PAIPPADU KOTTAYAM	DR. SALI SEBASTIAN
4	FHC KADUTHURUTHY	DR CHITRA R
5	PHC KOZHUVANAL	DR. DIVYA GEORGE
6	CHC KOODALLOOR	DR REKHA
7	PHC KADANAD	DR.VIJISHA VIJAYAN
8	FHC KADAPLAMATTOM	DR.SOBHASREE
9	PHC KATTAMPAK	DR. ALEX THOMAS
10	MCH KTM	DR SAJITH KUMAR
11	CHC VAKATHANAM KOTTAYAM	DR SIMI
12	KMCHC ETTUMANOOR	DR ELIZABETH
13	FHC VELLAVOOR KOTTAYAM	DR ARUN KRISHNA B

14	CHC THALAYOLAPARAMBU	DR. SUDHARMANI T THANKAPPAN
15	FHC MUNDAKKAYAM	DR.MATHEW
16	PHC AYMANAM	DR.ANISH
17	CHC KUMARAKOM KOTTAYAM	DR RAJESH P R
18	FHC MEENACHIL	DR NIRMAL MATHEW JOSE
19	PHC POONJAR KOTTAYAM	P S USHA KUMARI
20	FAMILY HEALTH CENTRE@KOTTAYAM	DR JOTHI SUSSAN JOY
21	FHC VELIYANNOOR	DR RACHANA CHANDRAN
22	FHC PAIPPAD	DR.SALI SEBASTIAN
23	FHC KOOROPPADA	DR VINU PRASAD L
24	GENERAL HOSPITAL, CHANGANACHERRY	DR. AJITH KUMAR S L
25	FAMILY HEALTH CENTRE MADAPPALLY	PRADEEP ABRAHAM
26	FHC PARAMPUZHA	REXON PAUL V
27	ATHIRAMPUZHA PHC KOTTAYAM	DR.MERLIN SEBASTIAN
28	CHC AYARKUNNAM	DR.SOUMYA LIMSON
29	GHPALA	DR SITHARA C J
30	CHC PAIKA	DR. RESHMA
31	GH KOTTAYAM	DR.SITHARA
32	FHC MEENADOM KOTTAYAM	DR. RENJU S V
33	KOTTAYAM MUNICIPALITY	DR. LINTO LAZAR
34	PRIMARY HEALTH CENTRE, THIRUVARPPU, KUMARAKOM, KOT	DR. RAJESH
35	THQH PAMPADY KOTTAYAM	DR PARVATHY M KAIMAL
36	FHC KALLARA VAIKOM KOTTAYAM	DR.SUSHANTH
37	THQH VAIKOM	DR SREEKUMAR

KOZHIKODE DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	MEDICAL COLLEGE KOZHIKODE BLOOD BANK 2	DR DEEPA NARAYANAN
2	THQH KOYILANDY KKD	DR. SANDHYA KURUP
3	FHC PURAMERY KOZHIKODE	DR PRADOSHKUMAR M
4	PHC KOTTUR	DR. SAJNA
5	PHC KUNDUTHODE	RETHUSHA E R
6	CHC CHERUVANNUR KOZHIKODE	DR.SHADIYA
7	DH VATAKARA KOZHIKODE	DR ALI K V
8	CHC ORKKATTERY KOZHIKODE	DR.USMAN.P.K
9	TALUK HEADQUARTERS HOSPITAL KOYILANDY	DR K SANDHYA KURUP
10	PHC KAKKUR, KOZHIKODE	THARA K
11	FHC PERUVANNAMUZHI	DR.SHARON M .A
12	GOVT.MENTAL HEALTH CENTRE KOZHIKODE	DR.UNNIKRISHNAN.

13	FHC KAYAKKODY KOZHIKODE	DR.SAJITHA
14	BLOOD BANK MEDICAL COLLEGE	DR. ARCHANA
15	TALUK HOSPITAL PERAMBRA	SURESH
16	FHCAZHIYURKOZHIKODE	DR ABDUL NAZEER
17	FHC MOODADIKOZHIKODE	DR. JEENA ELIZABATH THOMAS
18	CHC KODANCHERY , KOZHIKODE	DR.ANURADHA
19	PHC KAKKODI	DR.DIVYA
20	PHCKEEZHARIYUR	ASHARAF
21	TALUK HOSPITAL FEROKE	DR.LALUJONESR
22	FHC IRINGAL	DR BAIGU
23	GENERAL HOSPITAL KOZHIKODE	DR. SALWAH ALI
24	PHC MANGAD KOZIKODE	DR.ABDUL JAMAL
25	FHC AZHIYUR	DR ABDUL NAZEER
26	PHC PERUVAYAL	DR. JAYARAJAN.V
27	FHC CHORODE KOZHIKODE	DR. DAISYGORE
28	KOZHIKODE MUNICIPAL CORPORATION	DR RS GOPAKUMAR
29	FHC PERUMANNA	DR. VRIJESH
30	PHC KIZHAKKOTH,KOZHIKODE	DR HAIFA MOIDEEN
31	REGIONAL PUBLIC HEALTH LABORATORY KOZHIKODE	SUJATHA M
32	PHC CHOOLUR	DR SUNIL KUMAR
33	CHC KODUVALLY	DR. RINCY ANTONY
34	GOVT TALUK HOSPITAL THAMARASSERY	DR SHEEJA PC
35	MCH UNIT CHERUPPA	DR BINSU VIJAYAN
36	CHC ULLIYERI,KOZHIKODE	DR.MADHAVASARMA BINOY
37	FHC AVALA, KOZHIKODE	DR.MUHAMMED KAMARUDDHIN.D.
38	FHC ARIKKULAM	DR SWAPNA

MALAPPURAM DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	CHC VETTOM MALAPPURAM	DR AJAY MUKUND
2	FHC ATHANIKKAL	DR SURESH M
3	CHC PURATHUR	DR. SHAMJITHA S
4	THQH TIRURANGADI MALAPPURAM	DR.ABOOBACKER
5	DISTRICT HOSPITAL TIRUR MALAPPURAM	DR KRISHNADAS
6	DISTRICT HOSPITAL TIRUR MALAPPURAM	BABY LAKSHMI
7	CHC KALIKAVU	DR SHAJI
8	CHC EDAVANNA	DR SHAMSAD
9	CHC KALIKAVU	DR JAZEELA

10	GENERAL HOSPITAL MANJERI	ANITHA
11	FHC VAZHAKKAD	DR. JUNAINA PA
12	PHC KOOTILANGADI, MALAPPURAM	DR FATHIMA M
13	FAMILY HEALTH CENTRE KOTTAKKAL	BHAVYA
14	FHC A.R.NAGAR,MALAPPURAM	JYOTHI C.M
15	PHC CHEMMALASSERY	DR.ASHA JALAL
16	FHC PONMALA	DR SHAMEER KP
17	FHCCHALIYAR	DR.ANOOP TN
18	PHC THENNALA	DR MUHAMMAD SAHEER
19	COMMUNITY HEALTH CENTRE TANUR	DR MOHAMMEDKUTTY CT
20	FAMILY HEALTH CENTRE, IRINGALLUR	DR.DIVYA M.T.
21	THQH MALAPPURAM	DR. ALIGAR BABU C
22	DISTRICT HOSPITAL PERINTHALMANNA MALAPPURAM	DR ANOOP VS
23	FHC CHELEMBRA	DR. ANILKUMAR PC
24	COMMUNITY HEALTH CENTRE TANUR	DR MOHAMMEDKUTTY CT
25	CHC CHUNGATHARA	DR. ARUNIMA
26	MES MEDICAL COLLEGE, PERINTHALMANNA	DR. NARAYANAN NAMBOOTHIRI G
27	PHC MARANCHERY NEW	DR.SHANFIYATH C V
28	FHC MOORKKANAD	DR.SHAMEERAMOLE.TP
29	PHC KEEZHATTUR MALAPPURAM	DR FUHAD KOYISSAN
30	THQH PONNANI	DR VAHIDA K I
31	FHC MARAKKARA, MALAPPURAM	DR. GEETHA M T
32	PHC KALPAKANCHERY	MEDICAL OFFICER
33	DISTRICT PUBLIC HEALTH LAB MALAPPURAM	DR ABINI KE
34	THQH KONDOTTY	DR PRADEEPKUMAR
35	GOVERNMENT MEDICAL COLLEGE MANJERI MALAPPURAM	DR. ARDRA R MENON
36	PRIMARY HEALTH CENTRE VETTATHUR	DR SHABANA PARVEEN
37	CHC VENGARA	DR.SANJU
38	PHC THUVVUR. MALAPPURAM	DR. ABDUL AZEEZ M
39	FHC KUZHIMANNA,MALAPPURAM	DR.RAHEENA.A.K
40	DISTRICT HOSPITAL NILAMBUR,MALAPPURAM	PRAVEENA.K.K
41	24X7 PHC VALANCHERY	DR.SALWA.M.P
42	DISTRICT HOSPITAL NILAMBUR,MALAPPURAM	DR.PRAVEENA
43	FHC MORAYUR	DR NAJVA
44	GOVT MEDICAL COLLEGE MANJERI	DR MARY TRESA
45	ANAKKAYAM PHC MALAPPURAM	DR YOONUSS SALEEM.MK

PALAKKAD DISTRICT		
--------------------------	--	--

SL.NO	NAME OF TEAM	NODAL OFFICER
1	PHC LAKKIDI	DR. MALINI
2	CHC KADAMPAZHIPPURAM PALAKKAD	DR DHANYA S P
3	CHC AGALI PALAKKAD	DR VINEETH THILAKAN
4	CHC KONGAD	DR ARCHANA
5	CHC CHALISERRY PALAKKAD	DR KHALEEL MAJID
6	THQH ALATHUR PALAKKAD	DR FLEMY
7	BPHC CHALAVARA	DR. ASWATHY
8	CHC KOPPAM PALAKKAD	DR SIDIQ
9	CHC KODUVAYOOR PALAKKAD	DR SINDHU
10	CHC PARALI PALAKKAD	DR DHANESH
11	MUNICIPALITY PALAKKAD	DR.SREERAM SANKAR
12	CHC ALANELLUR PALAKKAD	DR PAMEELI
13	AMBALAPPARA	DR MALINI V S
14	CHC VADAKKENCHERRY PALAKKAD	DR. ANAND . N
15	THQH MANNARKKAD	DR PAMEELI N N
16	CHC KUZHALMANNAM PALAKKAD	DR. KRISHANA KUMAR
17	CHC PAZHAMBALACODE LAB PALAKKAD	VINOJ K.V
18	CHC NANNIODE PALAKKAD	ASHNA C MANUEL
19	THQH CHITTUR	DR RAHUL VARMA
20	BLOODBANK DISTRICT HOSPITAL PALAKKAD	DR.KAILAS
21	DISTRICT HOSPITAL PALAKKAD	DR.KAILAS

PATHANAMTHITTA DISTRICT		
--------------------------------	--	--

SL.NO	NAME OF TEAM	NODAL OFFICER
1	GH ADOOR	DR SAHNY M SOMAN
2	FHC EZHAMKULAM	SREEJITH BABU
3	CHC KALLOPPARA	DR RAJESH P
4	ENADIMANGALM CHC	DR ARUN JUDE
5	GENERAL HOSPITAL PATHANAMTHITTA	DR GINU
6	PHC KADAPRA	DR ANAKHA A RANI
7	GENERAL HOSPITAL PATHANAMTHITTA	DR.ASHISH MOHANKUMAR
8	PHC RANNY ANGADY	SHAJI B
9	PHC KADAMMANITTA PATHANAMTHITTA	DR.JACOB KURUVILA
10	CHC KANJEETTUKARA PATHANAMTHITTA	DR. AJITHA
11	PHC KOKKATHODU	SREEJAYAN C
12	PHC KUTTAPUZHA PATHANAMTHITTA	DR REVATHY
13	BLOOD BANK GH PATHANAMTHITTA	DR GINU

14	CHC ENADIMANGALAM	ASEEM
15	THQH THIRUVALLA	DR GINU
16	KONNI TALUK HOSPITAL PATHANAMTHITTA	DR. AJAY ABRAHAM
17	KONNI TALUK HOSPITAL LAB, PATHANAMTHITTA	DR. GRACE MARIAM GEORGE
18	PHCKOODAL	SUNIL KUMAR G
19	FHC NIRANAM PATHANAMTHITTA	DR.GINU
20	THQH RANNI	DR SABARI
21	PHC NARANAMMOOZHY	DR MAHIMA JOHN
22	THQH RANNI	DR SABARI
23	FHC KOIPURAM PATHANAMTHITTA	DR. BIBIN SAJAN
24	TALUK HOSPITAL MALLAPPALLY	DR SWAPNA K V
25	CHC VECHOOCHIRA LAB	DR. ASHISH PANICKER
26	PHC KUTTOOR	DR.JYOTHEENDRAN S
27	FHC KOTTANGAL PATHANAMTHITTA	DR. MINU JOSEPH T
28	FHC CHANDANAPALLY	DIVEEN SEN GEETH D
29	PHCPANDALAMTHEKKEKARA PATHANAMTHITTA	DR SYAM PRASAD R
30	FIELD DATA COLLECTION TEAM-1	DR JAISON
31	FHC CHENNEERKKARA	DR. GINU G THOMAS
32	PHC KULANADA	DR UMA PRAVEEN

THIRUVANANTHAPURAM DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	WCH TVPM	DR DHANYA G KRISHNAN
2	UPHC KANNAMMOOLA	DR A FASEELATHU BEEVI
3	GMC TRIVANDRUM	DR.SARADA DEVI KL
4	UPHC VETTUCAUD	DR. MARY RAMSAL
5	PHC PERUMATHURA	DR.ARNOLD DEEPAK
6	UPHC NANTHANCODE	SAI JPHN
7	FHC VAMANAPURAM, THIRUVANANTHAPURAM	DR NAJMA H
8	PRIMARY HEALTH CENTRE PULLAMPARA	VIJAYAGOPAL
9	TALIK HOSPITAL FORT TVPM	SURESH.G
10	FHCAMACHALTVM	DR. T. SANTHAKUMAR
11	FAMILY HEALTH CENTRE BALARAMAPURAM	DR AHILAPRIYADARSINI
12	UPHC ATTUKAL THIRUVANANTHAPURAM	DEEPTHI AS
13	VELI PHC THIRUVANANTHAPURAM	DR. DHANYADEV
14	FHC CHEMMARUTHY TRIVANDRUM	DR ANWAR ABBAS
15	DMH PEROORKADA THIRUVANANTHAPURAM	DR SUMI S S
16	CHC PUTHENTHOPE THIRUVANANTHAPURAM	DR ACHAMMA A S
17	UPHC VATTIYOORKAVU TVM	REMYAMOL
18	FAMILY HEALTH CENTRE VIZHINJAM(NEW),MUKKOLA	JACOBVARGHESE

19	PHC THIRUVALLAM	DR MINU JACOB
20	FHC ANAD	DR.MANOJ KUMAR P R
21	GH NEYYATTINKARA TRIVANDRUM	VIJAYAKUMAR B
22	DISTRICT SAMPLE COLLECTION UNIT, THIRUVANANTHAPURA	DR. CHITHRA L R
23	CHC VIZHINJAM TRIVANDRUM	DR VASHITHA GUNASELVI
24	MCHU PANGAPPARA, TRIVANDRUM	VINUKUMAR. R
25	FHC MUDAKKAL THIRUVANANTHAPURAM	DR SARITHA
26	UPHCMAMAPAZHAKKARA TRIVANDRUM	TOONEY
27	UPHC RAJAJINAGAR TRIVANDRUM	RAJI SMITHA
28	UPHC KALIPAMKULAM TRIVANDRUM	DRISYA S
29	FHC KALLIKKADU THIRUVANANTHAPURAM	SANTHOSH KUMAR S A
30	CHC PULLUVILA, TRIVANDRUM	DR.JISHA R S
31	UPHC MAMPAZHAKKARA TRIVANDRUM	TOONEY
32	CHC KALLARA, THIRUVANANTHAPURAM	SAHLA. I
33	FHC KEEZHATTINGAL	SUBHASH
34	CHCVILAPPILTHIRUVANANTHAPURAM	RAJEEV S R
35	CHC MANAMBOOR THIRUVANANTHAPURAM	DR JESSY ALEX
36	UPHC CHALAI THIRUVANANTHAPURAM	SALINI LS
37	TALUK HOSPITAL VITHURA, THIRUVANANTHAPURAM	DR.SHEEN S F
38	PHC PERUMPAZHUTHOOR	SHERBIN BL
39	INDIAN INSTITUTE OF DIABETES PULAYANARKOTTA, TVM	DR. GINU
40	FHC PULIMATH, THIRUVANANTHAPURAM	RAMLA. J
41	PHC AZHOOR	BENOY
42	GENERAL HOSPITAL TRIVANDRUM	DR. CEENA V NETTO.
43	ACR LAB TRIVANDRUM	ANEESH JOHN VARGHESE
44	UPHC PALKULANGARA THIRUVANANTHAPURAM	SUMA G G
45	FHC KARAKULAM THIRUVANANTHAPURAM	DR JASMIN SM
46	SAT HOSPITAL HES TRIVANDRUM	DR CHITHRA
47	FHC KADAKAMPALLYI	DR SUMITHA
48	UPHC MUTTADA	SHINI PB
49	TALUK HEADQUARTERS HOSPITAL PARASSALA	DR B UNNIKRIISHNAN
50	BLOOD BANK GENERAL HOSPITAL TRIVANDRUM	DR MARY ALOYSIUS
51	FHC PARANIYAM, THIRUVANANTHAPURAM	DR SUBI VP
52	DISTRICT HOSPITAL NEDUMANGAD THIRUVANANTHAPURAM	SHAMEJ PETER
53	HDS LABORATORY MCH TVPM	SUJI K K
54	CHC POONTHURA TVPM	DR BEENA S THAMPI

THRISSUR DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	GOVERNMENT MEDICAL COLLEGE,THRISSUR	DR.VIMAL RAJ.A.N
2	CHALAKUDY MUNICIPALITY	DR LIZ AUGUSTINE
3	CHC OLLUR	DR. BIJU G PILLAI
4	PHC OLLUKKARA	DR ANN THOMAS
5	GENERAL HOSPITAL THRISSUR	DR.SREEDEVI TP
6	PHC MUNDATHIKODE	DR. RADHIKA N
7	CHC PUTHENCHIRA	DR ARUN A VICTOR
8	T H QH CHAVAKKAD, THRISSUR DT	DR. SREEJA P K
9	TALUK HOSPITAL KUNNAMKULAM	DR.MANIKANDAN. A V
10	PHC AVINISSERY THRISSUR	DR. BINEETHA V SASIDHARAN
11	CHC ANTHIKAD	DR.SHIJINA.V.V
12	FHC MELOOR	RESHMI S
13	FHC MUNDUR	DR GREESHMA.P
14	THQH KODUNGALLUR THRISSUR	DR UNNIKRISHNAN
15	CHC THOLUR THRISSUR	DR.MANOJ C VARGHESE
16	PHC PANJAL THRISSUR	DR.SUNILKUMAR.P.K
17	PHC PADIYOOR	DR: JAYACHANDRAN.KC
18	PRIMARY HEALTH CENTRE ARIMBUR THRISSUR	DR DEEPAK MENON
19	FHC MANALUR THRISSUR	AJAY RAJAN
20	TALUK HEAD QUARTERS HOSPITAL CHALAKUDY THRISSUR	DR SHEEJA N A
21	FHC VILVATTOM THRISSUR	PRIYA P A
22	PHC KOORKANCHERY THRISSUR	JILSHO GEORGE
23	FHC ELAVALLY THRISSUR	DR CHINTHA K P
24	FHC THEKKUMKARA	DR.SHARA B
25	CHC ERUMAPETTY	DR NIYAS
26	GENERAL HOSPITAL THRISSUR	DR.SREEDEVI T P
27	CHC PAZHANJI THRISSUR	DR. DEVIPRIYA
28	PHC VARAVOOR THRISSUR	DR REMYA GEORGE
29	FHC AYYANTHOLE, THRISSUR	DR. VINEETHA K R
30	FAMILY HEALTH CENTRE KAIPAMANGALAM	DR ANU BABY
31	CHC KADAPPURAM THRISSUR	SREEKALA T P
32	GENERAL HOSPITAL THRISSUR	DR.SREEDEVI T P
33	FAMILY HEALTH CENTER	DR SOUMYA
34	PHC AVINISSERY	DR.BINEETHA V SASIDHARAN
35	FHC KOOLIMUTTAM	MANJITH KRISHNAN C
36	FHC MADAKKATHARA	DEPA SAMUEL
37	PHC KUTHAMPULLY	DR.RACHANA K

38	FHC VELUR	DR SEBIN CC
39	NADATHARA FHC	DR SALINI P S
40	DH WADAKANCHERY	DR. RIMSY
41	FAMILY HEALTH CENTER POYYA	DR BOBBIN PAUL
42	PHC AVANOOR	DR SHEEMA GANGADHARAN
43	FHC THRIKKUR	LIDIYA JAMES
44	PHC PORATHISSERY	DR BINU K B
45	CHC VELLANIKKARA THRISSUR	DR. JAYANTHY K S
46	GENERAL HOSPITAL IRINJALAKUDA	DR MINIMOL A A

WAYANAD DISTRICT

SL.NO	NAME OF TEAM	NODAL OFFICER
1	CHC MEENANGADI WAYANAD	DR.KUNHINHIKANNAN
2	GOVT THQH SULTHAN BATHREY	DR PRASHEEN
3	CHC PULPALLY	DR. THOMAS MATHEW
4	WAYANAD DIST TEAM	DR.VINCENT GEORGE
5	THQH VYTHIRI	DR VIVEK
6	MEPPADI BLOCK SAMPLE COLLECTION TEAM	DR SHAHID
7	CHC PANAMARAM	DR. SHEEJA.V R
8	WAYANAD DISTRICT MOBILE TEAM	DR JINU JOSEPH
9	BLOOD BANK, DISTRICT HOSPITAL, MANANTHAVADY	DR.BINIJA MERIN JOY

KERALA COVID-19 SEROSURVEY JANUARY 2021- DESIGNATED LABORATORIES AND LAB IN CHARGE

DISTRICT WISE ALLOCATION OF DESIGNATED LABORATORIES	NAME OF LAB MEDICAL OFFICER / LABORATORY IN CHARGE
THIRUVANANTHAPURAM	
ACR LAB, MEDICAL COLLEGE HOSPITAL THIRUVANANTHAPURAM	DR. RAGI K V MR ANEESH JOHN VARGHESE
HDS LAB MEDICAL COLLEGE HOSPITAL THIRUVANANTHAPURAM	DR. SANTHOSH KUMAR S S MS SUJI K K
SAT HOSPITAL HES LAB, THIRUVANANTHAPURAM	DR. ANITHA A MS. SIMI K V
KOLLAM	
DISTRICT PUBLIC HEALTH LAB KOLLAM	DR SIJI JOSE P MS. AISWARYA MS. SEREENA SALIM
PATHANAMTHITTA	
INDIAN INSTITUTE OF DIABETES, THIRUVANANTHAPURAM	DR. JABBAR P K DR. REMLA A
ALAPPUZHA	
DISTRICT PUBLIC HEALTH LAB ALAPPUZHA	DR. SOUMYA VASUDEVAN MS. INDU K
KOTTAYAM	
GENERAL HOSPITAL, KOTTAYAM	DR. SAPNA SANAL MR. PRAKASH S
IDUKKI	
DISTRICT HOSPITAL, PAINAV	DR. SAM MATHEW MS. SAJEENA V A MR. MUHAMMED SHAFEER A

ERNAKULAM	
DISTRICT HOSPITAL ALUVA	DR. SNEHAMOL MS. GANGAMMA K G
GENERAL HOSPITAL, MOOVATUPUZHA	DR. SALI KURIAN MS. SHINEY JACOB
GOVT TALUK HEAD QUARTERS HOSPITAL, PERUMBAVOOR	DR. CIJO KUNJACHAN MS. DEEPA DIVAKARAN
THRISSUR	
GENERAL HOSPITAL, IRINJALAKUDA	DR. MINIMOL A A MS. LATHA V MS. ANJANA
PALAKKAD	
RDC LAB DISTRICT HOSPITAL, PALAKKAD	DR. INDU V P MR .MAHIP M
MALAPPURAM	
DISTRICT PUBLIC HEALTH LAB, MALAPPURAM	DR. ABINI K E MR ABDUL KAREEM M
GOVT. MEDICAL COLLEGE HOSPITAL, MANJERI.	DR. ANITHA P M DR. ARDRA R MENON MS. ANITHA P U
DISTRICT HOSPITAL, NILAMBUR	DR. PRAVEENA K K MS. SARITHA PV
KOZHIKODE	
REGIONAL PUBLIC HEALTH LAB, KOZHIKODE	DR.SUJATHA M MR. ANIL KUMAR O
GOVERNMENT MENTAL HOSPITAL, KOZHIKODE	DR. UNNIKRISHNAN MR. SIVADASAN N
WAYANAD	
BLOOD BANK, GOVT. MEDICAL COLLEGE KOZHIKODE.	DR. DEEPA NARAYANAN DR. ARCHANA MS. ABITHA MS. ANITHA KUMARI

KANNUR	
DISTRICT HOSPITAL KANNUR	DR. SHAHEEDA MR. SACHIDANANDAN T
REGIONAL PUBLIC HEALTH LAB- KANNUR	DR. LEENA P MR.SASIKUMAR T
KASARAGOD	
DISTRICT HOSPITAL KANJANGAD	DR. PRAVEEN K C MR.REJIL V

KERALA COVID-19 SEROSURVEY JANUARY 2021	
TELE COUNSELLORS, NHM THIRUVANANTHAPURAM	
ASWATHY DAS R C	TELE COUNSELLOR
DHANYA S T	TELE COUNSELLOR



KERALA COVID-19 SEROSURVEY JANUARY 2021**DISTRICT SURVEILLANCE OFFICERS- COVID, SEROSURVEY NODAL OFFICERS AND DISTRICT LAB TECHNICIANS**

DISTRICT	DISTRICT SURVEILLANCE OFFICER- COVID	DISTRICT NODAL OFFICERS - SEROSURVEY	DISTRICT LAB TECHNICIAN
KASARAGOD	DR. MANOJ A T	DR. APARNA B DR. NIRMAL	MS. NALINI T A
KANNUR	DR. PREETHA M	DR. AKHIL R NAMBIAR	MR AHAMMED KABEER
KOZHIKODE	DR. ASHA DEVI	DR. ANURADHA T C	MR. SURESH.M.A
WAYANAD	DR. SOUMYA S	DR. NAVYA THAIKATTIL	MR. ABDUL MAJEED MANNAYIL
MALAPPURAM	DR. MOHAMED ISMAYIL Dr. K JITHESH	DR PRAVEENA K K	MS. RASEENA K
PALAKKAD	DR. NAZAR K A	DR KAILAS P	MR. KUTABUDEEN
THRISSUR	DR. ANOOP T K	DR. MINI	Mr. JAYAPRAKASH K
ERNAKULAM	DR. SREEDEVI S	DR. NIKHILESH MENON R DR. SUDHAKAR REDDY	MS. SREEKALA P R
KOTTAYAM	DR. RAJAN K R	DR. SITHARA C J	MS. JAYA ALEXANDER
IDUKKI	DR. SUSHAMA P K	DR. SURESH VARGHESE	MS. AJINA
ALAPPUZHA	DR. DEEPTHI K K	DR. VIPIN K RAVI	MR. SUNNY MATHEW
PATHANAMTHITTA	DR. NANDINI C S	DR. GINU G THOMAS	MR. BINU N S
KOLLAM	DR. R SANDHYA	DR. JOHN MATHEW	MR. SUDHEER K
THIRUVANANTHAPURAM	DR. JOSE G D'CRUZ	DR. CHITHRA L R Dr. KRISHNA D S DR. DEEPA	MRS. SHEELA MRS.SAKEENA BEEVI (Sr.LT)

KERALA COVID-19 SEROSURVEY JANUARY 2021

NATIONAL INFORMATICS CENTRE, KERALA STATE CENTRE

SHRI. MOHANA DHAS T	DEPUTY DIRECTOR GENERAL & STATE INFORMATICS OFFICER
SMT. ASHA VARMA K C	SCIENTIST F
SHRI. EDWARD SAM T	SCIENTIST F
SHRI. AHAMED SHAHEER J	SCIENTIST C

KERALA COVID-19 SEROSURVEY JANUARY 2021

KERALA MEDICAL SERVICES CORPORATION LIMITED- TEAM

SRI. A R AJAYAKUMAR IAS	MANAGING DIRECTOR
DR. DILEEPKUMAR S R	GENERAL MANAGER
SRI. K R NARENDRANATH	DEPUTY MANAGER
SRI. ANUP T U	ASSISTANT MANAGER
SMT. PRABHAVATHI DEVI P P	ASSISTANT
SRI. SAJEEV N	DEO
SMT. JISHA V	DEO

KERALA COVID-19 SEROSURVEY JANUARY 2021**ABBOTT TECHNICAL, TRAINING AND SUPPORT TEAM**

MR. AMAL GEORGE	KEY ACCOUNTS MANAGER , ABBOTT DIAGNOSTICS. KL AND TN
DR. HUSSAIN ALI	MEDICAL SCIENTIFIC LIAISONING MANAGER
MR. SUMANTH KOLOOTH	AMBASSADOR, ABBOTT DIAGNOSTICS. KL
MR. JITHIN PREETHA	TECHNICAL APPLICATION SPECIALIST, ABBOTT DIAGNOSTICS. KL AND TN
MR. ARUN KURIAKOSE	TECHNICAL SERVICE SPECIALIST, ABBOTT DIAGNOSTICS, KL
MR. PRAVEEN K A	MANAGING PARTNER
MR. DONEY SANALRAJ	SERVICE ENGINEER, ABBOTT DIAGNOSTICS, KL
MR. ROHIT P	SERVICE ENGINEER, ABBOTT DIAGNOSTICS, KL

KERALA COVID-19 SEROSURVEY JANUARY 2021**DISTRICT HEALTH ADMINISTRATION**

DISTRICT	DISTRICT MEDICAL OFFICER	DISTRICT PROGRAM MANAGER
THIRUVANANTHAPURAM	DR. SHINU K. S	DR.ARUN P V
KOLLAM	DR SREELETHA R	R.HARIKUMAR.S
PATHANAMTHITTA	DR. SHEEJA A L	DR.ABEY SUSHAN
ALAPPUZHA	DR. ANITHA KUMARY L	DR. K R RADHAKRISHNAN
KOTTAYAM	DR JACOB VARGHESE	DR, VYAS SUKUMARAN
IDUKKI	DR.PRIYA N.	DR.SUJITH SUKUMARAN
ERNAKULAM	DR. N K KUTTAPPAN	DR MATHEWS NUMPELI
THRISSUR	DR.K.J.REENA	DR SATHEESAN.T.V
PALAKKAD	DR.K. P. REETHA	DR. A SHIBULAL
MALAPPURAM	DR. K SAKEENA	DR. A SHIBULAL
KOZHIKODE	DR. JAYASREE .V	DR. NAVEEN A
WAYANAD	DR.RENUKA .R	DR. ABHILASH B
KANNUR	DR. K NARAYANANAİK	DR. ANIL KUMAR.P.K
KASARAGOD	DR. A.V.RAMADAS	DR. RAMAN SWATHY VAMAN

KERALA COVID-19 SEROSURVEY JANUARY 2021

PREVENTION OF EPIDEMIC AND INFECTIOUS DISEASES CELL (PEID CELL)

STATE PEID CELL

DR. INDU P S, CO-ORDINATOR
 DR. ANUJA M, ASSOCIATE PROFESSOR
 MR. MADHUSOODANAN D, ASSISTANT PROFESSOR
 MS. GOPIKA, DEO

REGIONAL PEID CELL IN CHARGE, TEAM MEMBERS AND HEAD OF DEPARTMENT OF COMMUNITY MEDICINE

REGIONAL PEID CELL	IN CHARGE AND TEAM MEMBERS	HEAD OF DEPARTMENT OF COMMUNITY MEDICINE
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE THIRUVANANTHAPURAM	DR. INDU D	DR. INDU P S
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE KOLLAM	DR. ZINIA T NUJUM	DR. ANUJA U
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE ALAPPUZHA	DR. ASHA K P	DR. SAIRU PHILIP
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE KOTTAYAM	DR. ANITHA BHASKAR DR ANUPA LUCAS DR. AJITH R	DR. SOBHA A
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE IDUKKI	DR. MINU MOHAN DR. JENYZ MUNDODAN	DR. NISHA R S
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE ERNAKULAM	DR. BINDHU VASUDEVAN	DR. MANJULA V D
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE THRISSUR	DR. BINU AREEKAL DR. SUDHIRAJ T S	DR. MINI S S

REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE MALAPPURAM	DR. NILEENA KOSHY	DR. ASUMA A
REGIONAL PEID CELL GOVT. MEDICAL COLLEGE KOZHIKODE	DR. JAYAKRISHNAN T THAYYIL DR. BIJU GEORGE DR. PRAIYA CHANDRAN DR. ATHIRA T MS. SINDHU V MS. SASIKALA P	DR THOMAS BINA
REGIONAL PEID CELL, GOVT. MEDICAL COLLEGE KANNUR	DR. A K JAYASREE DR. ENID ELIZABETH THOMAS	DR. A K JAYASREE

KERALA COVID-19 SEROSURVEY JANUARY 2021	
SECRETARY AND DIRECTORS OF DEPARTMENT OF HEALTH AND FAMILY WELFARE, GOVT. OF KERALA	
PRINCIPAL SECRETARY, HEALTH AND FAMILY WELFARE AND DEPARTMENT OF AYUSH, GOVERNMENT OF KERALA	DR RAJAN N KHOBRADE, IAS
STATE MISSION DIRECTOR	Dr Rathan Kelkar IAS
DIRECTOR, DEPARTMENT OF HEALTH SERVICES, GOVT. OF KERALA	DR. SARITHA R L
DIRECTOR, DEPARTMENT OF MEDICAL EDUCATION GOVT. OF KERALA	DR. REMLA BEEVI A

KERALA COVID-19 SEROSURVEY JANUARY 2021

SCIENTIFIC AND TECHNICAL SUPPORT TEAM

DR. TONY LAWRENCE, Assistant Professor, Community Medicine, Govt. Medical College Thiruvananthapuram

DR. INDU P S, Professor and Head Department of Community, State PEID cell co-ordinator, Govt. Medical College Thiruvananthapuram

DR. V. MEENAKSHY, Additional Director (Public Health), Directorate of Health Services, Govt. of Kerala

DR. ZINIA T NUJUM, Associate Professor, Dept. of Community Medicine, Govt. Medical College Kollam.

DR. SANTHOSH KUMAR, Chairman, State Medical Board, Professor and Head Dept. of Pediatrics, Govt. Medical College Thiruvananthapuram.

DR. SUNIJA S, Director State Public Health Lab, Thiruvananthapuram

DR. SARADADEVI K L, Professor and Head Dept. of Microbiology, Govt. Medical College Thiruvananthapuram.

DR. ARAVIND R, Member State Medical Board, Head, Department of Infectious Diseases, Govt. Medical College Thiruvananthapuram.

DR. RAKESH P S, Consultant, TB Elimination, World Health Organization

DR. BINU AREEKAL, Additional Professor, Dept. of Community Medicine, Govt. Medical College Thrissur.

DR. LIBU G K, Associate Professor, Community Medicine, Govt. Medical College Thiruvananthapuram.

DR. CHINTHA S, Associate Professor, Community Medicine, Govt. Medical College Thiruvananthapuram.

DR. NEETHA MURTHY, Microbiologist, Reference Lab for TB, Kerala.

DR. APARNA MOHAN, Junior Resident, Community Medicine, Govt. Medical College, Thiruvananthapuram

KERALA COVID-19 SEROSURVEY JANUARY 2021- ANALYSIS AND REPORT COMMITTEE

NAME	DESIGNATION
DR. MEENAKSHI V	Additional Director Of Public Health, Directorate Of Health Services, Govt. Of Kerala
DR. A SANTHOSH KUMAR	Chairman, State Medical Board, Govt. Of Kerala, Professor And Head Department Of Paediatrics, Superintendent SAT Hospital, Govt. Medical College Thiruvananthapuram.
DR. SUNIJA S	Director, State Public Health Lab, Govt. Of Kerala
DR. INDU P S	Professor & Head, Community Medicine, Govt. Medical College Thrissur.
DR. SARADA DEVI	Professor & Head, Microbiology, Govt. Medical College Thiruvananthapuram
DR. VIMALA C	Professor And Head Community Medicine, & Co-Ordinator, State PEID Cell, Govt. Medical College Thiruvananthapuram.
DR. ZINIA T NUJUM	Associate Professor, Community Medicine, Govt. Medical College Kollam.
DR. RAKESH P S	Consultant, TB Elimination, World Health Organization
DR. BINU AREEKAL	Additional Professor, Community Medicine, Govt. Medical College Thrissur
DR. ARAVIND R	Member of State Medical Board & Head, Infectious Diseases, Govt. Medical College Thiruvananthapuram
DR. CHINTHA S	Associate Professor, Community Medicine, Govt. Medical College, Thiruvananthapuram
DR. LIBU G K	Associate Professor, Community Medicine, Govt. Medical College, Thiruvananthapuram
DR. APARNA MOHAN	Junior Resident, Community Medicine, Govt. Medical College, Thiruvananthapuram
DR. TONY LAWRENCE	Assistant Professor, Community Medicine, Govt. Medical College, Thiruvananthapuram

KERALA COVID-19 SEROSURVEY JANUARY 2021- SELECTED PHOTOGRAPHS

PHC VELLARIKUNDU TEAM, KASARAGOD DISTRICT, OBTAINING INFORMED CONSENT FROM A PARTICIPANT IN A POLICE STATION.



GENERAL HOSPITAL IRINJALAKKUDA, DESIGNATED LABORATORY FOR
THRISSUR DISTRICT



**SUPPORTIVE SUPERVISION AT DISTRICT HOSPITAL ALUVA AND
GENERAL HOSPITAL MOOVATTUPUZHA, DESIGNATED LABS FOR
ERNAKULAM DISTRICT.**



FIELD DATA COLLECTION – ERNAKULAM DISTRICT





DISTRICT PUBLIC HEALTH LAB MALAPPURAM, DESIGNATED LAB



SAMPLE PACKING IN THE FIELD, PHC MARANCHERY MALAPPURAM DISTRICT



FIELD DATA COLLECTION – PALAKKAD DISTRICT



FIELD DATA COLLECTION- AMBALAVAYAL CHC AREA AND MEPPADI POLICE SATIATION, WAYANAD DISTRICT



DATA ENTRY AND SAMPLE ID GENERATION ON THE ONLINE PLATFORM, CHC PUTHENTHOPE, THIRUVANANTHAPURAM DISTRICT



PHC KARAKULAM, THIRUVANANTHAPURAM DISTRICT

