

COVID19  
DEATH AUDIT REPORT  
MARCH 2021



Department of Health & Family Welfare

Government of Kerala

## DEATH AUDIT REPORT OF COVID-19 RELATED DEATHS- AUDITED DURING MARCH-2021

### **1. INTRODUCTION**

The State Level Death Audit Committee met at 10.30 AM on March 2<sup>nd</sup> ,9<sup>th</sup>, 16<sup>th</sup>, 23<sup>rd</sup> and 30<sup>th</sup> , 2021 for auditing the COVID and communicable diseases deaths occurred in the state. For assigning the cause of death (COVID) the definitions of WHO and ICD classification were followed.

#### **Definition of COVID-19 death**

A COVID-19 death is defined for surveillance purposes as a death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID-19 disease (e.g., trauma). There should be no period of complete recovery between the illness and death.

#### **Definitions based on International Statistical Classification of Diseases (ICD)**

An emergency ICD-10 code of 'U07.1 COVID-19, virus identified' is assigned to a disease diagnosis of COVID-19 confirmed by laboratory testing. An emergency ICD-10 code of 'U07.2 COVID-19, virus not identified' is assigned to a clinical or epidemiological diagnosis of COVID-19 where laboratory confirmation is inconclusive or not available. Both U07.1 and U07.2 may be used for mortality coding as cause of death.

In ICD-11, the code for the confirmed diagnosis of COVID-19 is RA01.0 and the code for the clinical diagnosis (suspected or probable) of COVID-19 is RA01.1.

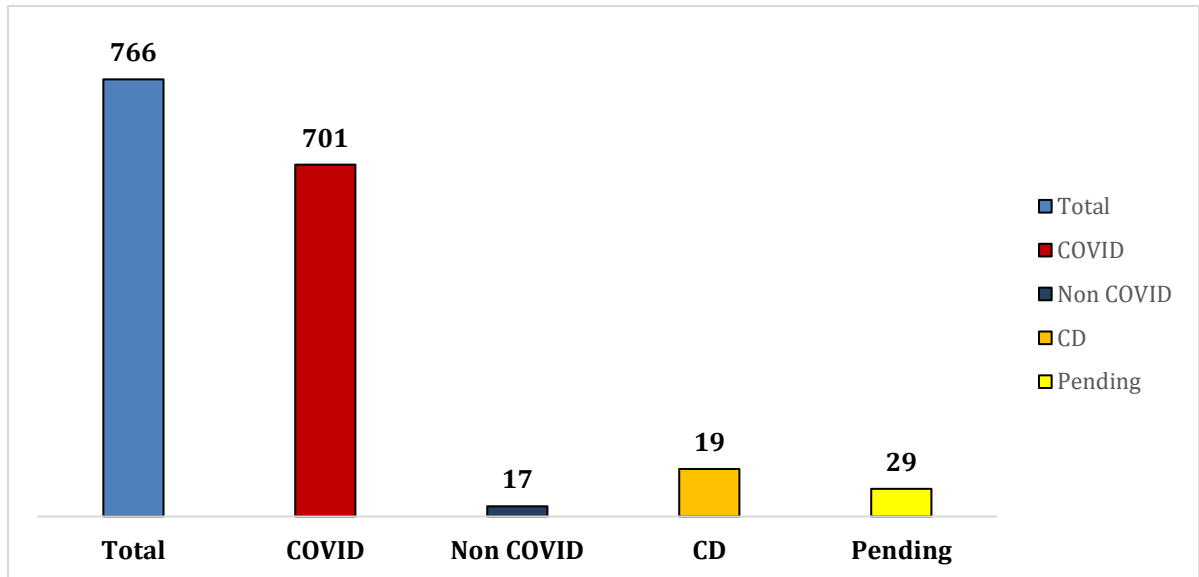
## References

- 1) World Health Organization. COVID-19-19
- 2) Coding in ICD-10. <https://www.who.int/classifications/icd/COVID-19-19-coding-icd10.pdf>

## **2. MATERIALS & METHODS:**

The information was collected from the DIR (Death investigation report) received from the Districts and Medical Bulletin issued by the concerned Medical Colleges/ Tertiary Health care facilities where the patient had attended eventually. Information of various demographic parameters, clinical and laboratory findings, details of treatment and surveillance were obtained wherever possible. Results are depicted in tables and figures.

### 3. OVERVIEW OF DEATHS AUDITED

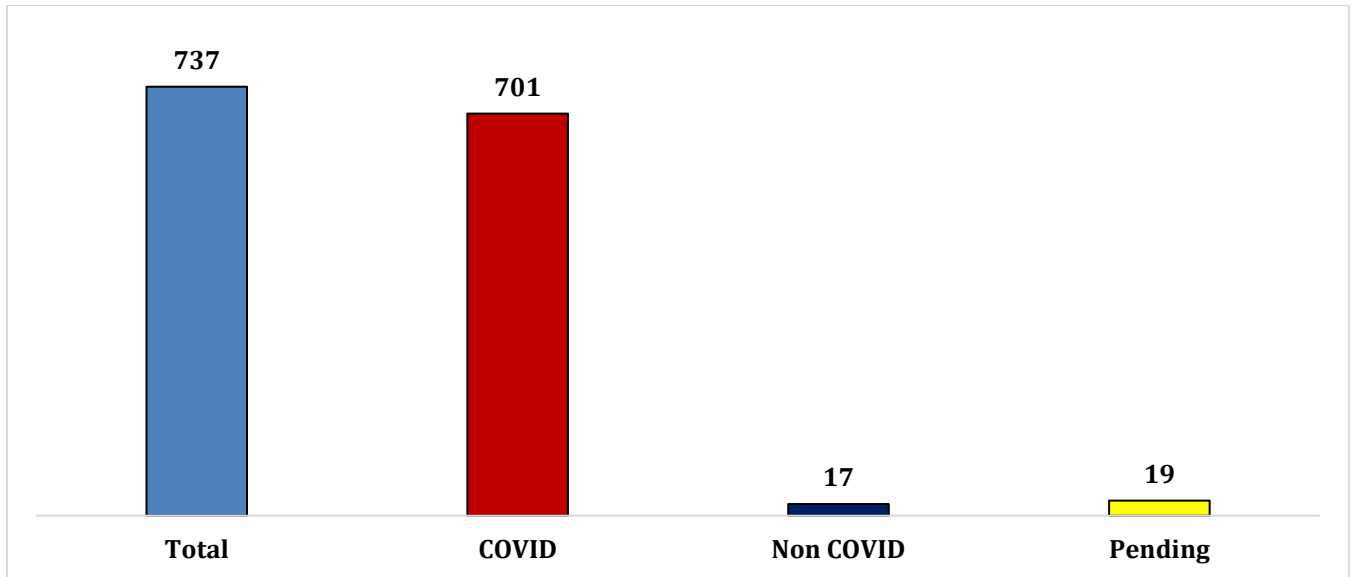


*Figure.1 Overview of deaths audited in March 2021 (N=766)*

Out of the 766 deaths audited, 701 were assigned to have the underlying cause of death as COVID-19; 17 deaths as Non-COVID, 19 as other Communicable Diseases (CD) deaths and 29 were kept pending due to want of sufficient details (Fig.1).

## 4. ANALYSIS OF COVID-19 DEATHS

### 4.1 Overview of COVID Related Deaths audited



*Fig.2 Overview of COVID deaths audited in March (N=737)*

Out of the 737 COVID related deaths audited, 701 were classified as to have the underlying cause of death as COVID-19; 17 deaths were assigned underlying cause of death as Non-COVID and 19 were kept pending due to want of sufficient details (Fig.2).

#### 4.2 District wise distribution of COVID-19 Deaths

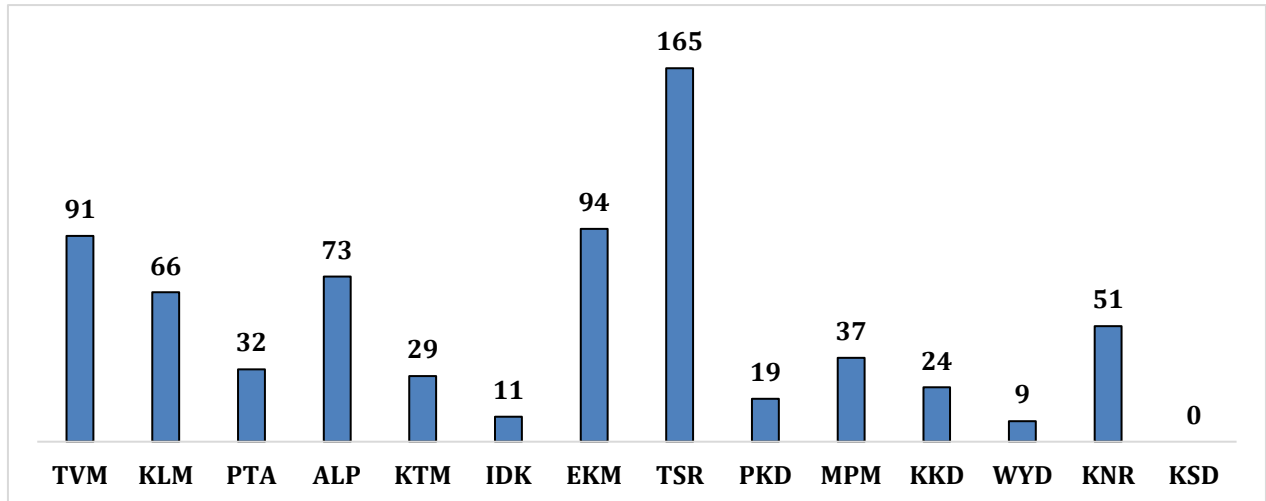


Fig.3. District wise distribution of COVID-19 Deaths audited in March (N=701)

Out of the 701 COVID deaths audited, Thrissur district contributed maximum deaths (165) followed by Ernakulam and Thiruvananthapuram districts (Fig.3).

### 4.3 Age Distribution of COVID-19 Deaths

Table.1. Age wise distribution of COVID 19 deaths (N=701)

| <b>Age</b> | <b>N</b> | <b>%</b> |
|------------|----------|----------|
| 10-19      | 0        | 0        |
| 20-29      | 3        | 0.43     |
| 30-39      | 11       | 1.58     |
| 40-49      | 35       | 5.00     |
| 50-59      | 91       | 13.00    |
| 60-69      | 191      | 27.00    |
| 70-79      | 223      | 31.81    |
| 80-89      | 133      | 19.00    |
| 90-99      | 13       | 1.85     |
| 100-110    | 1        | 0.14     |

Age distribution varied from 20 to 100 years and the most affected age group belongs to 70-79 years (31.81%).

4.4 Gender distribution of COVID-19 Deaths

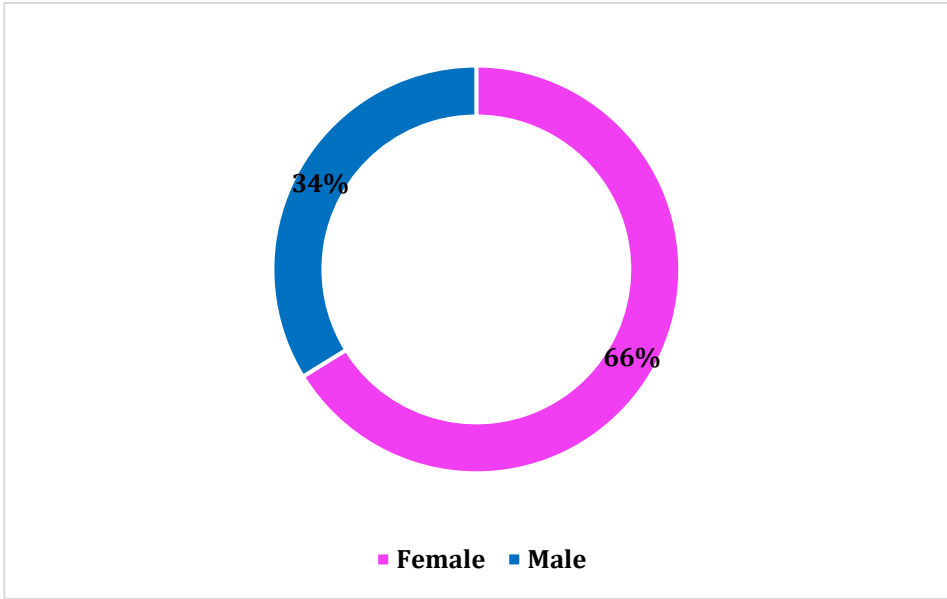


Fig.4 Gender distribution of the COVID-19 deaths audited (N=701)

Among the 701 deceased, 464 (66%) were males and 237 (34%) were females.



#### 4.5 Presence of comorbidities among the COVID Deaths

Table.2.1 Presence of comorbidities among the COVID-19 deaths audited (N=701)

| <b>Comorbidities</b> | <b>N</b> | <b>%</b> |
|----------------------|----------|----------|
| Diabetes mellitus    | 433      | 62       |
| Hypertension         | 391      | 56       |
| CAD                  | 174      | 25       |
| CKD                  | 137      | 19.7     |
| CVA                  | 35       | 5.02     |
| COPD                 | 82       | 11.8     |
| Cancer               | 52       | 7.5      |
| Bedridden            | 6        | 0.86     |
| CLD                  | 24       | 3.16     |
| Bronchial asthma     | 20       | 2.9      |
| TB                   | 17       | 2.43     |
| Psychiatric illness  | 17       | 2.4      |
| No comorbidities     | 28       | 4.1      |

Among the deceased, diabetes mellitus was the most common comorbidity found (62%) followed by hypertension (56%) and majority of them had multiple comorbidities.

## 5. NON-COVID DEATHS

A total of 17 deaths were identified to have the underlying cause of death as Non-COVID

[5.1 The underlying cause of deaths among the Non-COVID deaths are provided in Table.3.](#)

Table.3. Summary of Underlying causes of deaths among Non-COVID deaths (N=17)

| <i>Cause of Death</i>                         | <i>Number</i> |
|---|---------------|
| Acute Coronary Syndrome/Myocardial Infarction | 6             |
| Viral Myocarditis                             | 1             |
| Fulminant Viral Hepatitis (Hep E)             | 1             |
| Metabolic Encephalopathy                      | 1             |
| COPD a/c exacerbation                         | 1             |
| Decompensated Liver d/s                       | 1             |
| Intra Cranial Bleed                           | 1             |
| Suicide                                       | 2             |
| Road traffic accident                         | 3             |
| Total   | 17            |

## 5.2 Details of Non-COVID deaths

Table.4. Details of Non-COVID Deaths (N=17)

| SL. No : | DST | Code of deceased | Age | Gender | Comorbidities | Date of death | Cause of Death                | Underlying Cause of Death COVID / Non-COVID |
|----------|-----|------------------|-----|--------|---------------|---------------|-------------------------------|---|
| 1        | KKD | SDAC/03/21-01    | 50  | M      | HTN           | 18-06-20      | CAD/ACS/Myocardial Infarction | Non COVID                                   |
| 2        | KTM | SDAC/03/21-02    | 68  | M      | DM/HTN/CAD    | 18-02-21      | FULMINANT VIRAL HEPATITIS - E | Non COVID                                   |
| 3        | EKM | SDAC/03/21-03    | 37  | M      | NIL           | 02-01-21      | Suicide(Hanging)              | Non COVID                                   |
| 4        | EKM | SDAC/03/21-04    | 74  | F      | ACS/HTN/CAD   | 19-01-21      | CAD/ACS/Myocardial Infarction | Non COVID                                   |
| 5        | EKM | SDAC/03/21-05    | 66  | M      | DM/HTN/CKD    | 02-01-21      | ACS, Myocardial Infarction    | Non COVID                                   |
| 6        | EKM | SDAC/03/21-06    | 71  | M      | COPD          | 16-01-21      | COPD a/c Exacerbation         | Non COVID                                   |
| 7        | EKM | SDAC/03/21-07    | 75  | M      | ACS/DM/CAD    | 21-01-21      | CAD/ACS/Myocardial Infarction | Non COVID                                   |
| 8        | EKM | SDAC/03/21-08    | 24  | M      | NIL           | 08-01-21      | RTA                           | Non COVID                                   |

| SL. No : | DST     | Code of deceased | Age | Gender | Comorbidities          | Date of death | Cause of Death                           | Underlying Cause of Death COVID / Non-COVID |
|----------|---------|------------------|-----|--------|------------------------|---------------|--|---|
| 9        | EK<br>M | SDAC/03/21-09    | 74  | M      | NIL                    | 14-01-21      | Suicide (Hanging)                        | Non COVID                                   |
| 10       | EK<br>M | SDAC/03/21-10    | 36  | M      | NIL                    | 07-01-21      | Fever/Viral Myocarditis                  | Non COVID                                   |
| 11       | EK<br>M | SDAC/03/21-11    | 60  | F      | DM/HTN                 | 27-01-21      | Metabolic Encephalopathy                 | Non COVID                                   |
| 12       | KL<br>M | SDAC/03/21-12    | 55  | M      | NIL                    | 22-02-21      | RTA (Traumatic brain injury)             | Non COVID                                   |
| 13       | KL<br>M | SDAC/03/21-13    | 25  | M      | NIL                    | 26-01-21      | RTA                                      | Non COVID                                   |
| 14       | EK<br>M | SDAC/03/21-14    | 67  | M      | HTN/DM                 | 21-03-21      | Intracranial Bleed                       | Non COVID                                   |
| 15       | EK<br>M | SDAC/03/21-15    | 74  | M      | NIL                    | 24-03-21      | CAD/ Myocardial Infarction               | Non COVID                                   |
| 16       | EK<br>M | SDAC/03/21-16    | 65  | F      | DM/CLD/ HYPOTHYROIDISM | 24-01-21      | Decompensated cirrhosis/massive GI bleed | Non COVID                                   |
| 17       | KK<br>D | SDAC/03/21-17    | 68  | M      | DM/HTN                 | 10-02-21      | CAD/ Myocardial Infarction               | Non COVID                                   |

\*ACS- Acute Coronary Syndrome, CAD- Coronary Artery Disease, CKD- Chronic Kidney Disease, CLD- Chronic Liver Disease, COPD- Chronic Obstructive Pulmonary

*Disease, DM- Diabetes, GI- Gastro-Intestinal, HTN- Hypertension, RTA- Road Traffic Accident.*

## **6. OTHER COMMUNICABLE DISEASES**

There were 19 other communicable diseases deaths audited.

## **7. PENDING DEATHS**

In 29 deaths, the cause could not be assigned, due to lack of clinical information and test results (of which 19 pending deceased reports are COVID related).

## **8. OBSERVATIONS AND SUGGESTIONS**

1. All COVID-19 related deaths other than brought dead cases had their care at Government Medical Colleges, FLTC's or tertiary care centers as per protocol.
2. The case sheets should be audited at the hospital itself by a team comprising the Superintendent, RMO, Physician, Microbiologist, the interventionist and a Public Health Expert (Institutional Medical Board). This should be handed over to the DMO. The district RRT members should also review the institutional death audit report after getting feedback from the concerned PHC/CHC team. The final death investigation/audit report should be sent to the State death audit committee within a week.
3. Gaps in histories of brought dead cases should be solved by verbal autopsy when there is insufficient information and autopsy report is not available. A verbal autopsy format was finalized for use in case inconclusive evidence was

submitted. This should be filled by the concerned PHC/CHC Medical officer and submitted to the State death audit team through the DSO. Swab testing of the brought dead persons should be done as per the protocol. (Autopsy of COVID-19 confirmed patients; dying while under treatment for COVID-19 is not required for classifying the underlying cause of death as COVID-19 or Non-COVID)

4. All most all of the deceased (95%) had one or other comorbidities and majority of them had multiple comorbidities. Hence symptom surveillance and testing of vulnerable population is needed for early detection and proper management. Vulnerable persons even if mildly symptomatic should be tested for COVID-19. Fatigability (tiredness) should be sorted as a symptom for surveillance among high-risk categories and challenged persons. Antigen testing may be increased to improve surveillance. Contact tracing, testing and treatment should be followed. Special precautions should be taken for persons with co-morbidities. IEC/BCC should be strengthened to bring awareness on reverse quarantine. The importance of reverse quarantine should be reemphasized and the practice monitored using the grass root level workers.
5. Each peripheral health institution should review the mapping of elderly and severely comorbid patients in their respective field areas. Ensure that health education and motivation are provided to these households so that reverse quarantine can be ensured. Symptom surveillance should be strengthened in these households. These persons may be motivated to monitor oxygen saturation so as to enable early detection of red flag signs and prompt health seeking.
6. Hospital acquired infection was also noticed among the deceased and hence hospital staff surveillance should be done routinely. At institutions thermal scanning and use of mask and hand sanitizer may be implemented prior to entry of staff to their working space/cabins. Infection prevention and control practices

(IPC) should be optimized in COVID-19 and non-COVID health care settings. Training to all categories of health staff has to be given periodically. Attenders and Nursing Assistants have to be given warming up training sessions everyday a few minutes prior to entry to their duties by the Head Nurse. They should be provided with N-95 masks, face shields and gloves. Training on use and disposal of PPE to be given periodically.

7. IPC practices should be strengthened with special emphasis to 'Dialysis Centers', Oncology wards and Cancer Care Centers. At the institutional level work rotation based on buddy systems may be implemented.
8. At CFLTC's and CCC's there should be strict adherence to surveillance and referral protocol. Daily checking of vitals and use of pulse oximeter should be done effectively to avoid deaths and optimal referral to higher centres. Strict adherence to checklist on patient care and referral from CFLTC's and use of pulse oximeters, so that patient referral may be optimal to higher centers.
9. Field level, grass root workers have to be trained periodically on community prevention practices, including BCC on SMS (safe distancing, use of masks and hand sanitization)
10. Training of volunteers for improving community participation in social distancing should be done and experience certificates may be provided for their activities.
11. Since all the deceased could have contracted the disease either from institution or from the community, precautions should be taken at the community level on safe social distancing, use of masks, hand hygiene and sanitization. Crowding

and visiting crowded places should be avoided. SMS to be followed at marketplace, Bazars and wherever there's a chance of forming crowds.

08-04-2021

DEATH AUDIT TEAM





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