

COVID19  
DEATH AUDIT REPORT  
JANUARY 2021



Department of Health & Family Welfare

Government of Kerala

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

## 1. INTRODUCTION

The State Level Death Audit Committee met at 10.30 AM on January 6<sup>th</sup> ,8<sup>th</sup> ,12<sup>th</sup> ,15<sup>th</sup> ,19<sup>th</sup> ,22<sup>nd</sup> 27<sup>th</sup>,29<sup>th</sup> and on February 2<sup>nd</sup>, 2021 for auditing the COVID and communicable diseases deaths occurred via Google meet ID: id: <https://meet.google.com/fjv-raro-nom> .

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.

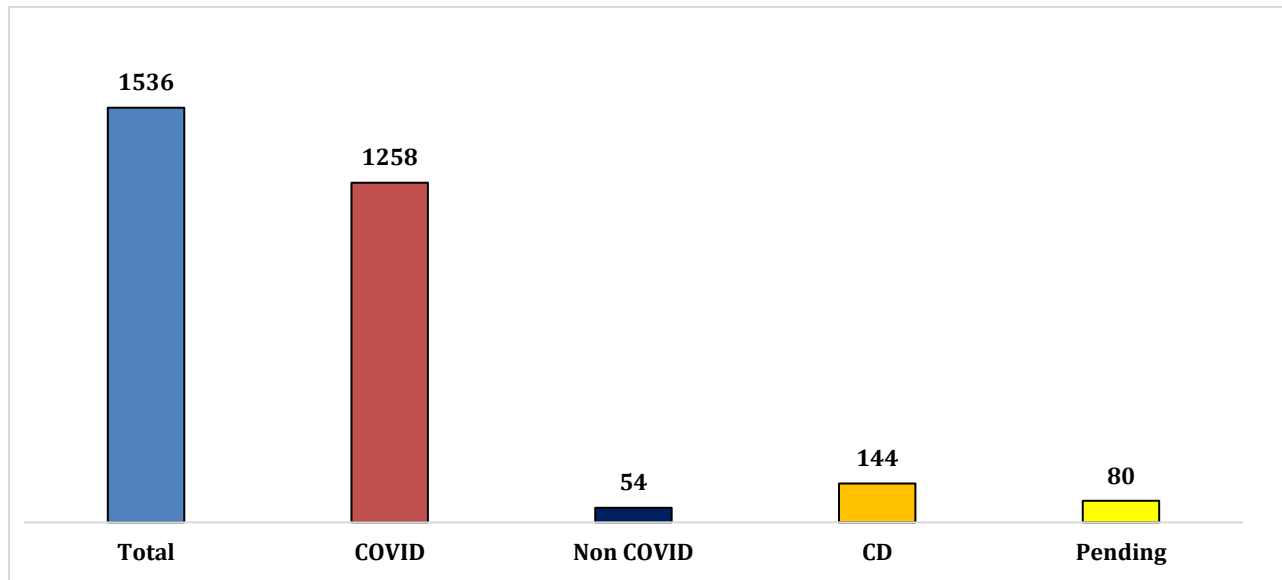
## **References**

- 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 & METHOD:**

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

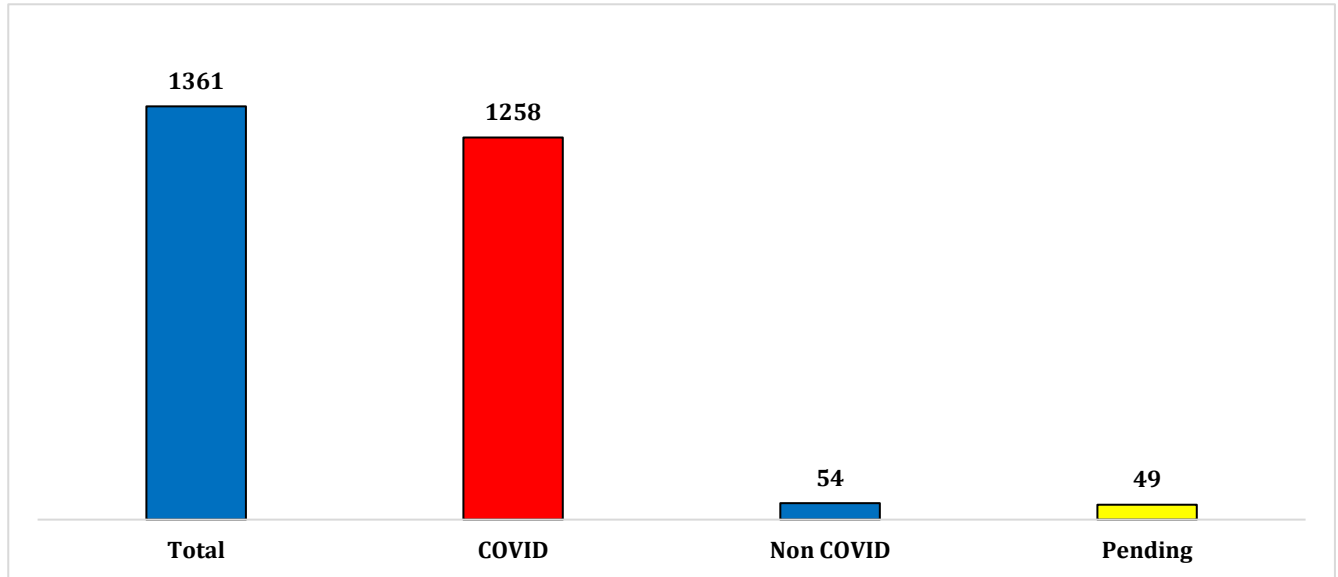


*Figure.1 Overview of deaths audited in January 2021 (N=1536).*

Out of the 1536 deaths audited, 1258 were classified as to have the underlying cause of death as COVID-19; Two deaths as COVID 19 & Leptospirosis coinfection; 54 deaths as Non-COVID ,144 as other Communicable Diseases deaths and 80 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 January (N=1361)*

Out of the 1361 COVID related deaths audited, 1258 were classified as to have the underlying cause of death as COVID-19; 54 deaths as Non-COVID and 49 were kept pending due to want of sufficient details (Fig.2).

#### 4.2 District wise distribution of COVID-19 related deaths

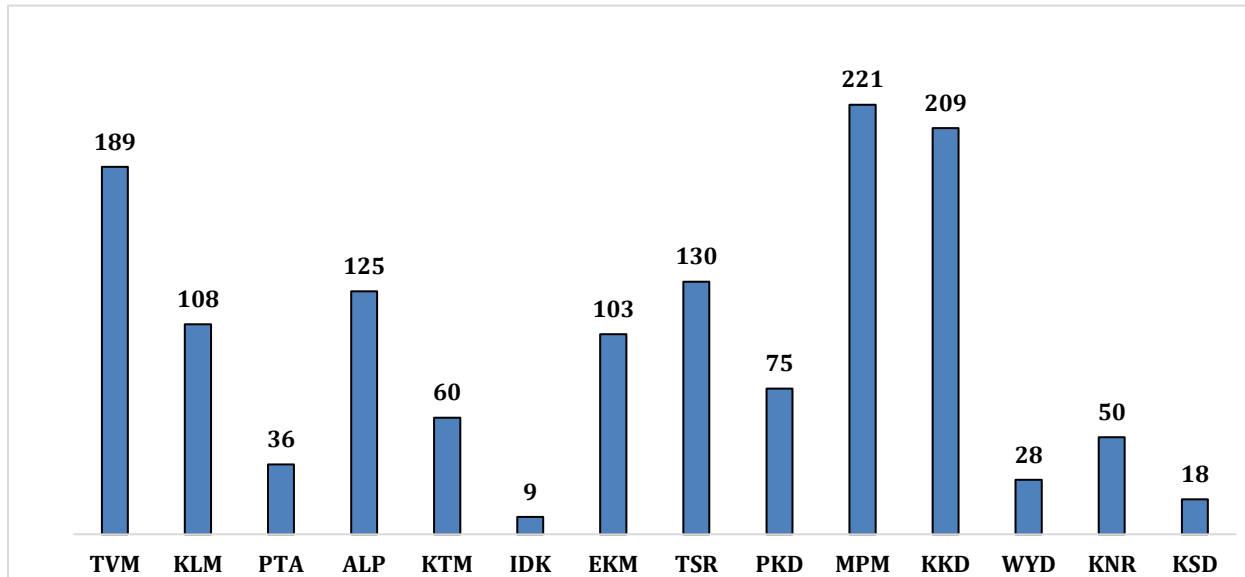


Fig.3. District wise distribution of COVID-19 related deaths audited in January (N=1361)

Out of the 1361 declared COVID deaths audited, Malappuram district contributed maximum deaths (221) followed by Kozhikode, and Thiruvananthapuram districts (Fig.3).

4.3 District wise distribution of COVID-19 deaths (underlying cause of death as COVID-19).

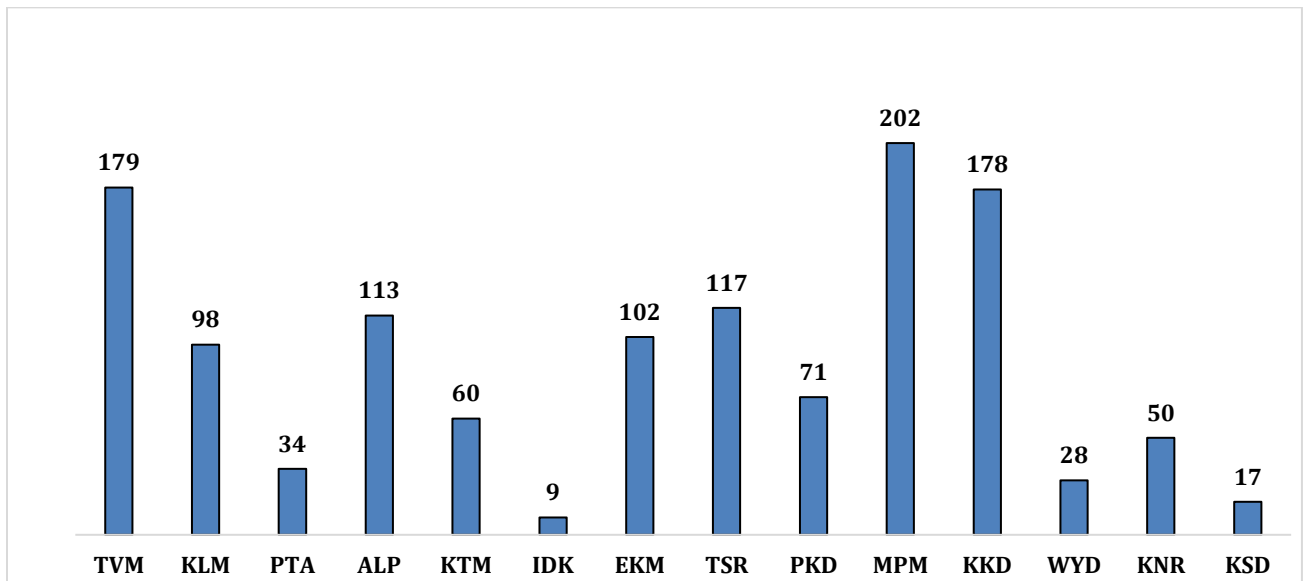


Fig.4. District wise distribution of deaths designated as COVID-19 in January (N=1258)

Out of the 1258 declared COVID deaths audited, Malappuram district contributed maximum deaths (202) followed by Kozhikode, Thiruvananthapuram, and Alappuzha districts (Fig.4)

#### 4.4 Age Distribution of COVID-19 Deaths

Table.1. Age wise distribution of COVID 19 deaths (N=1258)

<b>Age</b>	<b>N</b>	<b>%</b>
<b>0-9</b>	5	0.40
<b>10-19</b>	1	0.08
<b>20-29</b>	11	0.87
<b>30-39</b>	19	1.51
<b>40-49</b>	75	5.96
<b>50-59</b>	183	14.55
<b>60-69</b>	352	27.98
<b>70-79</b>	374	29.73
<b>80-89</b>	196	15.58
<b>90-99</b>	40	3.18
<b>100-110</b>	2	0.16

Age distribution varied from 4 days to 104 years and the most affected age group belongs to 70-79 years (29.73%).



#### 4.5 Gender distribution of COVID-19 Deaths

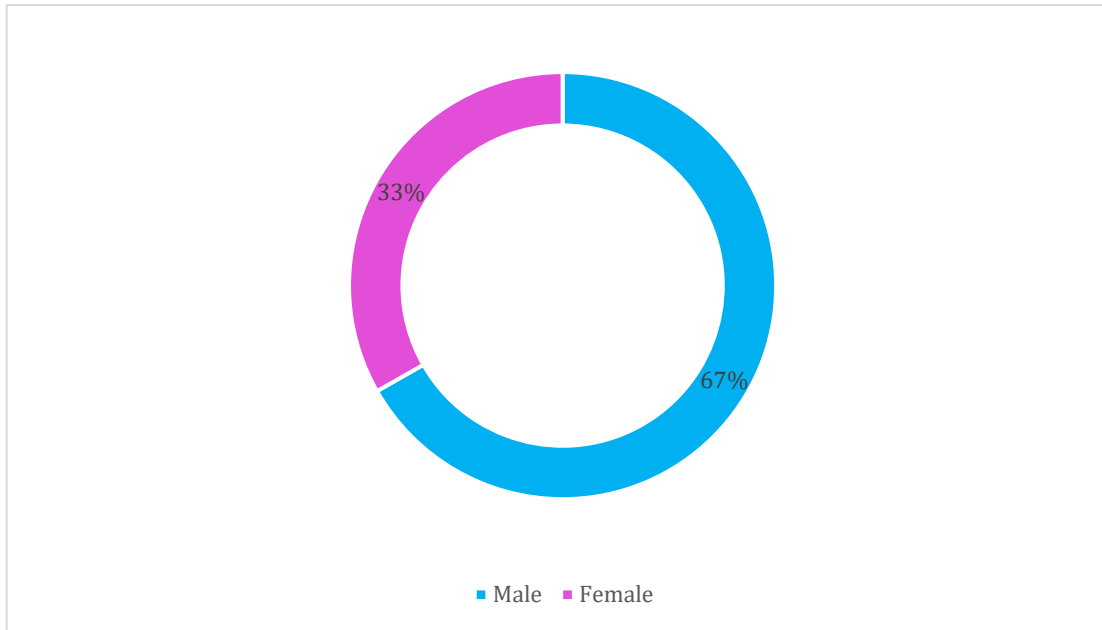


Fig.5 Gender distribution of the COVID-19 deaths audited (N=1258)

Among the 1258 deceased, 840 were males (67%) and rest were females.

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

Table.2. Presence of comorbidities among the COVID-19 deaths audited (N=1258)

Comorbidities	N	%
Diabetes mellitus	708	56.4
Hypertension	661	52.6
CAD	308	24.5
CKD	221	17.6
CVA	101	8.0
COPD	130	10.4
Cancer	45	3.6
Bedridden	11	0.9
CLD	44	3.5
Bronchial asthma	22	1.8
TB	18	1.4
No comorbidities	69	5.4

Among the deceased, diabetes mellitus was the most common comorbidity found (56.4%) followed by hypertension (52.6%) and majority of them had multiple comorbidities.

## 5. NON-COVID DEATHS

A total of 54 deaths were identified to have the underlying cause of death as Non-COVID

### 5.1 Underlying cause of deaths among the Non-COVID deaths.

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=54)

Cause of Death	Number
Acute Coronary Syndrome	13
Acute Pulmonary Oedema	1
Carcinoma	3
CKD	1
CLD	1
COPD	1
GI Bleed	4
Head Injury	2
Hypoglycaemia Encephalopathy	1
Intestinal Obstruction	2
Intraabdominal Infection	1
Pulmonary Oedema	1
Pyogenic Meningitis	1
Quadriplegia with diaphragmatic palsy	1
Stroke	9
Subarachnoid Haemorrhage	1
Subdural Haemorrhage	1
Suicide	4
Traumatic Spine Injury	1
Uremic Encephalopathy	3

Urosepsis	2
Total	54

S.no	Distri ct	Code of deceased	Age	Gender	Comorbidities	Date of death	Cause of death	Underlyin g Cause of Death COVID / Non-COVID
1	KKD	SDAC/01/21-1	71	M	CKD, HTN, CVA, CAD, CLD	04/12/20	Uremic Encephalopathy	Non COVID
2	ALP	SDAC/01/21-2	31	M	Nil	17/11/20	Suicide	Non COVID
3	ALP	SDAC/01/21-3	66	M	DM, HTN, CAD, CKD	26/11/20	Suicide	Non COVID
4	ALP	SDAC/01/21-4	66	F	sys. HTN	27/11/20	Stroke	Non COVID
5	KKD	SDAC/01/21-5	73	M	DM, Heart disease	23/10/20	Acute Coronary Syndrome	Non COVID
6	KKD	SDAC/01/21-6	60	M	CVA, Acc. Infract, Ischemic DCM	06/10/20	Stroke	Non COVID
7	KKD	SDAC/01/21-7	50	F	Nil	14/10/20	Head Injury	Non COVID
8	KKD	SDAC/01/21-8	68	M	HTN, CAD, TB	01/12/20	Acute Coronary Syndrome	Non COVID
9	KKD	SDAC/01/21-9	69	M	DM, CKD stage 3	14/10/20	Acute Coronary Syndrome	Non COVID
10	KKD	SDAC/01/21-10	90	F	Nil	18/11/20	Head Injury	Non COVID
11	KKD	SDAC/01/21-11	65	F	CKD	25/10/20	CKD	Non COVID
12	KKD	SDAC/01/21-12	27	M	Churg Strauss synd.,	03/08/20	Intraabdominal Infection	Non COVID
					Cholangitis with liver abscess			
13	KKD	SDAC/01/21-13	68	F	CAD, Hyponatremia, metabolic encephalopathy	03/10/20	Urosepsis	Non COVID
14	KKD	SDAC/01/21-14	37	M	Fall from tree	27/11/20	Traumatic Spine Injury	Non COVID
15	KKD	SDAC/01/21-15	58	M	CA lung	23/11/20	Carcinoma	Non COVID
16	TVM	SDAC/01/21-16	64	M	CLD, Portal HTN, AKI	20/12/20	Carcinoma	Non COVID
17	ALP	SDAC/01/21-17	66	M	DM, HTN, CAD, CKD	26/11/20	Suicide	Non COVID
18	ALP	SDAC/01/21-18	63	M	CLD, GI bleed	07/11/20	GI Bleed	Non COVID

19	TSR	SDAC/01/21-19	61	M	CAD, old CVA,DLP,HTN STEMI	31/10/20	Acute Coronary Syndrome		Non COVID
20	TSR	SDAC/01/21-20	80	M	CAD,CKD,DM,HTN	14/11/20	Urosepsis		Non COVID
21	TSR	SDAC/01/21-21	68	M	CAD,CKD	13/11/20	Acute Pulmonary Edema		Non COVID
22	TSR	SDAC/01/21-22	73	F	DM,HTN,CA Colon with Metastasis	25/11/20	Intestinal Obstruction		Non COVID
23	TSR	SDAC/01/21-23	74	F	CAD,STEMI,LV Dysfunction, CKD, DM	01/12/20	Acute Coronary Syndrome		Non COVID
24	TSR	SDAC/01/21-24	60	M	Hepatocellular Carcinoma with Portal vein Thrombosis, DM	11/12/20	GI Bleed		Non COVID
25	TSR	SDAC/01/21-25	49	M	nil	09/12/20	Acute Coronary Syndrome		Non COVID
26	TSR	SDAC/01/21-26	63	M	DM,COPD	12/12/20	Acute Coronary Syndrome		Non COVID
27	TSR	SDAC/01/21-27	72	M	CAD	15/12/20	Acute Coronary Syndrome		Non COVID
28	TSR	SDAC/01/21-28	56	M	CA Rectum, Septic shock, MODS	25/12/20	Carcinoma		Non COVID
29	TSR	SDAC/01/21-29	72	M	CKD, Uremic Encephalopathy	01/01/21	Uremic Encephalopathy		Non COVID
30	TSR	SDAC/01/21-30	45	M	AKI, uremic encephalopathy	05/01/21	Uremic Encephalopathy		Non COVID
31	TVM	SDAC/01/21-31	50	F	HTN, Hypothyroidism, ESRD	3.12.20	Stroke		Non COVID
32	TVM	SDAC/01/21-32	60	F	Nil	30/10/20	Stroke		Non COVID
33	TVM	SDAC/01/21-33	50	M	DM, COPD, Asthma, Pulm. Artery HTN	16/11/20	COPD		Non COVID

34	TVM	SDAC/01/21-34	65	M	HTN	29/11/20	Stroke		Non COVID
35	TVM	SDAC/01/21-35	46	M	Gastrointestinal stromal tumor rectum	04/12/20	Intestinal Obstruction		Non COVID
					with hepatic, Pulm. metastasis				
36	KSD	SDAC/01/21-36	61	M	HTN, DM, CKD, CAD	21/12/20	Acute Coronary Syndrome		Non COVID
37	TVM	SDAC/01/21-37	62	M	ACS, STEMI, CAD, COPD, sys. HTN, DM	20/12/20	Acute Coronary Syndrome		Non COVID
38	TVM	SDAC/01/21-38	45	M	DM	28/08/20	Hypoglycemia Encephalopathy		Non COVID
39	MLP	SDAC/01/21-39	85	M	CAD	22/09/20	Acute Coronary Syndrome		Non COVID
40	MLP	SDAC/01/21-40	65	M	DM, HTN, COPD	03/12/20	Stroke		Non COVID
41	MLP	SDAC/01/21-41	70	M	CAD, CKD, COPD, DM, HTN	18/10/20	Pulmonary Edema		Non COVID
42	MLP	SDAC/01/21-42	62	F	Nil	21/10/20	Quadriplegia with Diaphragmatic palsy		Non COVID
43	MLP	SDAC/01/21-43	24	F	COPD, CVA	02/09/20	CLD		Non COVID
44	MLP	SDAC/01/21-44	84	F	DM	03/01/20	GI Bleed		Non COVID
45	MLP	SDAC/01/21-45	74	F	old CVA, HTN, RA	15/11/20	Stroke		Non COVID
46	MLP	SDAC/01/21-46	38	F	DM, pyogenic meningitis	03/09/20	Pyogenic Meningitis		Non COVID
47	MLP	SDAC/01/21-47	70	M	Nil	18/10/20	Suicide		Non COVID
48	TVM	SDAC/01/21-48	51	F	Heart disease	20/11/20	Subdural Hemorrhage		Non COVID
49	KLM	SDAC/01/21-49	74	M	ACS, STEMI	27/12/20	Acute Coronary Syndrome		Non COVID

50	KLM	SDAC/01/21-50	64	M	End stage renal disease	29/12/20	Subarachnoid Hemorrhage		Non COVID
51	KLM	SDAC/01/21-51	76	M	CVA, Hemiparesis, CA lung, DM, HTN	23/12/20	Stroke		Non COVID
52	PKD	SDAC/01/21-52	66	M	COPD	17/12/20	GI Bleed		Non COVID
53	ALP	SDAC/01/21-53	84	M	DM, CKD, CAD	30/08/20	Acute Coronary Syndrome		Non COVID
54	EKM	SDAC/01/21-54	41	F	DM, HTN, STEMI	21/12/20	Stroke		Non COVID

## 5.2 Details of Non-COVID deaths

Table.4. Details of Non-COVID Deaths (N=54)



## **6. OTHER COMMUNICABLE DISEASES**

Two deaths were classified to have coinfection with COVID-19 and Leptospirosis. These deaths have been included in the list of COVID-19 deaths. There were 144 other communicable diseases deaths audited.

## **7. PENDING DEATHS**

In 49 deaths, the cause could not be found out due to lack of clinical information and test results.

## **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 (99%) 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.

**20-02-2021**

**DEATH AUDIT TEAM**





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