



**Summer Training**

**Max Super Specialty Hospital, Shalimar Bagh, Delhi**

**from 10<sup>th</sup> May 2021 to 2<sup>nd</sup> July 2021**

**Findings of Factors Responsible for RT-PCR Tested Covid Positive Patient's Recovery /  
Deterioration**

**By**

**Dr. Kopal Singhal**

**Under the guidance of**

**Mr. Alok Kumar Mathur**

**MBA- Hospital and Health Management**

**2020-2022**



# CERTIFICATE

## OF ACHIEVEMENT



**Max Institute of Medical Excellence**

Certifies that

**Dr Kopal Singhal**

has completed Internship in the department of

**Medical Administration**

at Max Super Specialty Hospital, Shalimar Bagh, New Delhi

from 10<sup>th</sup> May 2021 to 02<sup>nd</sup> July 2021

  
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SVP Research & Education  
Max Healthcare Institute Ltd

July 02, 2021

**TO WHOM IT MAY CONCERN**

This is to certify that **Dr. Kopal Singhal** student of IIHMR, Jaipur has completed summer internship programme from our hospital under the guidance of **Dr. Archana Bajaj (Medical Superintendent)**, **Dr. Gaurav Malik (Deputy Medical Superintendent)** and **Shivani Arora (Assistant Manager, Quality)**. The duration of summer internship was of 8 weeks effective from 10<sup>th</sup> May 2021 to 2<sup>nd</sup> July 2021.

During above period we found her Hardworking and sincere.

We wish her all the best for her future endeavour.

  
**Dr. Archana Bajaj**  
**Medical Superintendent**  
**Dr. Archana Bajaj**  
**Medical Superintendent**  
**Max Super Speciality Hospital**  
**FC-50, C&D Block, Shalimar Bagh**  
**New Delhi-110 088**

## **Abstract**

**Title:** Findings of Factors Responsible for RT-PCR Tested Covid Positive Patient's Recovery / Deterioration admitted at Max Health Care, Shalimar Bagh, New Delhi.

### **Study Objective:**

To access the factors responsible for RT-PCR Tested Covid positive patient's recovery / deterioration in hospital.

### **Methodology:**

This is a study with Quantitative method done at Max Health Care, Shalimar Bagh, Delhi. The study was a retrospective, observational and Cross-sectional descriptive study and convenience sampling technique was done to collect patient data. The duration of study was from 15<sup>th</sup> April 2021 to 20<sup>th</sup> May 2021.

### **Key Results:**

1. Majority of the patients who were admitted were in the higher age brackets. Only 5% of the patient who were admitted were under 30 years of age.
2. The average length of stay was seen to be between 10 to 12 days except for the age group between 18 to 30 years which was seen to be 17 days.
3. Around 78% of the patient were stable with the treatment whereas 20% of the patient were succumbed to death.
4. There is increase fatality rate by 2x in patients with hypertension and heart related disease whereas diabetes increases risk by 10%.
5. Patient above 60 years of age experience double fatality risk.
6. 88% of the patient who were admitted in ICU had SPO2 below 90% and 34% of patient admitted in ward had SPO2 below 90%.
7. 42 patient stayed for more than 2 weeks out of which 12 could not survive.
8. None of the treatment was seen to be assured effective for covid.

**Conclusion:** Covid is pandemic that has put unprecedented strain on healthcare system. There were various factors like age, comorbidity etc. which are responsible for recovery/ deterioration. No particular treatment seems to have assured results. More testing, early detection and timely symptomatic treatment is the only possible way to cure the disease.

## **Acknowledgement**

The completion of this understanding could not be possible without the assistance of so many people. I am grateful to **IIHMR University, Jaipur, Dr. PR Sodani** (Dean, IIHMR University, Jaipur) who gave me this opportunity to explore through this internship. I express my deep sense of gratitude to **Mr. Alok Kumar Mathur** (My university mentor) for encouraging and guiding me for my summer training and for his unconditional support.

The main purpose of the summer training is to know the practical as well as theoretical aspect and clarifying the career goals. It was a great chance of learning and professional development.

I like to express deepest appreciation to **Dr. Archana Bajaj** (Medical Superintendent). I will be always grateful to my hospital mentor **Dr. Gaurav Malik** (Deputy Medical Superintendent), who heartily welcomed me for my internship and enlightened me at each step. He always motivated and encouraged me. His valuable ideas helped me having deep insight into the subject and engrossing to smoothly complete my report. The liberty I got to work under him is peerless.

I also like to express my respect to **Mr. Sanjay Dhankar** (Senior Executive) and **Mr. Abhimanyu Gusain** (Asst. Manager HR) for providing me this great opportunity to work in **Max Super Specialty Hospital, Shalimar Bagh, New Delhi**. I also would like to express my sincere regards to all the department heads and staff for their cooperation. Lastly, my sincere thanks to **Max Healthcare** as a whole.

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**Abbreviation:**

|                                                           |
|-----------------------------------------------------------|
| • ACCU: Acute Coronary Care Unit                          |
| • AHU: Air Handling Unit                                  |
| • BCS: Breast Conservation Surgeries                      |
| • BMR: Bone Marrow Room                                   |
| • CAUTI: Catheter associated Urinary Tract Infection      |
| • CLABSI: Catheter associated Blood Stream Infection      |
| • CSSD: Central sterile supply department                 |
| • CT: Computed Tomography                                 |
| • CTVS: Cardio Thoracic and Vascular Surgery Department   |
| • DU-CU: Dirty Utility – Clean Utility                    |
| • EPABX: Electronic Private Automatic Branch Exchange     |
| • ETP: Effluent Treatment Plant                           |
| • EWS: Economically Weaker Section                        |
| • GDA: General Duty Assistant                             |
| • HDU: High Dependency Unit                               |
| • HIPEC: Hyperthermic Intraperitoneal Chemotherapy        |
| • ICN: Infection control nurse                            |
| • ICU: Intensive care unit                                |
| • IMRT: Intensity Modulated RT                            |
| • IP Pharmacy: Inpatient Pharmacy                         |
| • LMO Tank: Liquid Medicine Oxygen Tank                   |
| • LSS: Location Sub Store                                 |
| • MAMBS: Minimal Access, Metabolic and Bariatric Surgery  |
| • MRD: Medical record department                          |
| • MRI: Magnetic resonance imaging                         |
| • OPD: Outpatient Department                              |
| • OT: Operation Theatre                                   |
| • PAC: Preanesthetic Clinic                               |
| • PET-CT: Positron Emission Tomography Scan               |
| • RPM: Respiratory Motion Management System               |
| • RT-DIBH- Deep Inspiratory Breath Hold Radiation Therapy |
| • SBRT: Stereotactic and Vascular Surgery                 |
| • STP: Sewage Treatment Plant                             |
| • TEST: Total Skin Electron Therapy                       |



## **Max Super Specialty Hospital, Shalimar Bagh**

**‘Care for life’**



### **Overview of Max Super Specialty Hospital:**

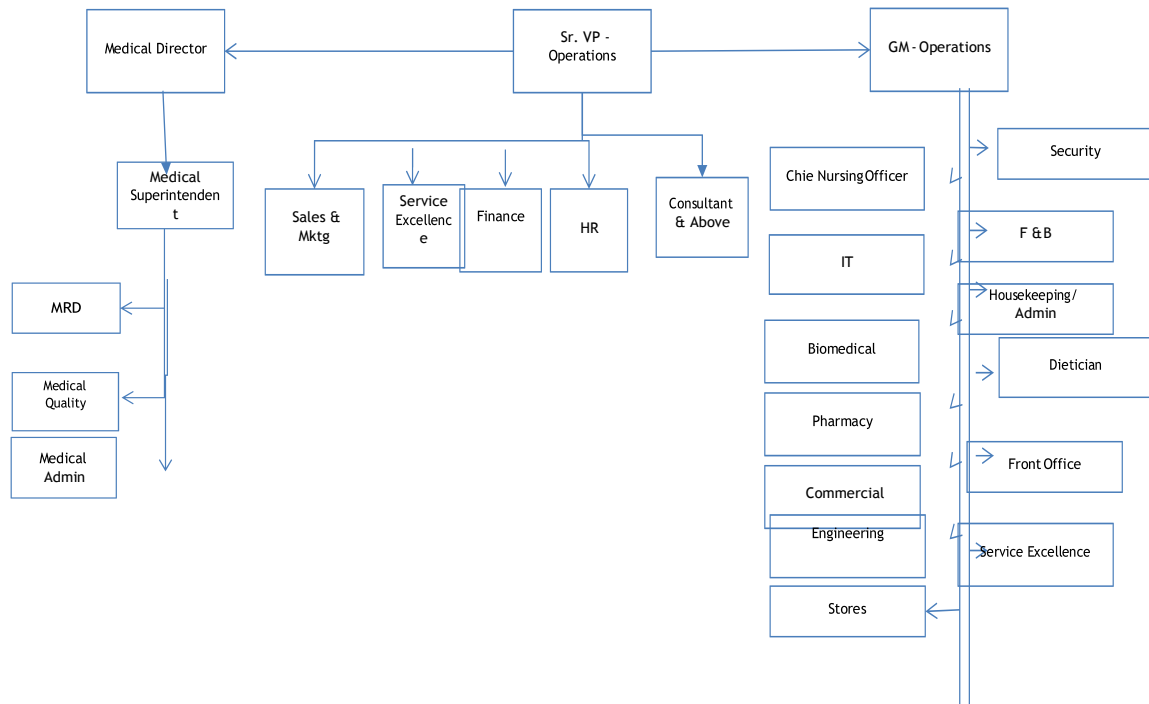
Max Hospital is a renowned chain hospital based in various locations in India. It has its various healthcare branches across the NCR (National Capital Region) of Delhi, North of India and Western Port of Mumbai. The first medical center of Max Healthcare was opened in South Delhi's Panchsheel Park in 2000. Max health care is led by Abhay Soi (Chairman) and managed and co-operated by KKR (The Iconic Equity Fund). The company was formed by acquisition of 49.7% stake in Erstwhile Max Healthcare Institute Limited by Radiant Life Care Pvt. Ltd. and the amalgamation of Max Healthcare Institute Limited.

In 2020, Max Healthcare got merged with the Radiant Life care. It has a network of 14 hospitals (i.e., 3400 Beds) spread across Delhi NCR, Uttar Pradesh, Uttarakhand, Haryana, Mumbai and Punjab. It offers treatment across 29 specialties. They have 2300+ expertise Doctors team. It is known name in healthcare industry for highly qualified Doctors, staff, healthcare professionals and advanced technology, patient care, world class infrastructure, and safety standards.

One of its branches is Max, Shalimar Bagh which was opened in 2010 and is 280 bedded offering services across all major disciplines which includes Cardiac sciences, Neurosciences, Cancer, Gastroenterology, General & Laparoscopic surgery, MAMBS,

Orthopedics, Nephrology, Renal Transplant, Urology, Laparoscopic cancer surgeries, Breast conservation surgeries, Sphincter prevention surgery, Cosmetic reconstructive surgery and HIPEC. Hospital is also equipped with MRI 1.5 Tesla, Discovery IQ PET CT, 16-Slice CT scanner, Philips (IE33) ECHO Machine, Neurosurgical Microscope, and Holmium laser. The Max Institute of Cancer has incorporated the latest advancement in radiation therapy like quick and precise radiation therapy techniques using True Beam Linear Accelerator capable of IMRT, Rapid Arc IMRT, Image guided RT, 4-D Respiratory gated RT, stereotactic RT (SRS/SRT/SBRT), Cardiac Sparing Breast RT-DIBH, TSET; Dedicated 4 D CT Stimulator with wide gantry bore, comfortable for patients & RPM. The facility also has Multi Channel HDR Brachytherapy in dedicated OT with capacity of Intra-cavitary, Interstitial, Intraoperative Brachytherapy. The hospital stands 12 Floors tall and covers over 2 lakh 98 thousand sq. ft area. There are around 200 expert Doctors and over 800 trained staff and have a regular foot fall of 800 OPD patients and 60 to 70 IPD patients in Shalimar Bagh Branch. They have an experience in treating more than 4,00,000 patients and continues to provide the best care and treatment.

## Organogram:



### **VISION:**

To become most well-regarded healthcare in the country and to deliver International Class service by focusing mainly on the creating a healthcare that commits to have highest clinical practice standards , patient care standards, scientific knowledge, medical education, cutting edge research and latest technology. We put an industry standard when it comes to cure, care and comfort.

### **MISSION:**

- ❖ Be the hospital of first choice for key specialties.
- ❖ Engaging the finest medical and non-medical talent across specialties and sub-specialties.
- ❖ Offering the gamut of sub specializations.
- ❖ Affordable healthcare.
- ❖ Transparency of treatment to our stakeholders and clients.
- ❖ Best patient care.
- ❖ To create expectational standards of service experience and medical experience.
- ❖ Choice for physicians.
- ❖ Ethical practices.
- ❖ First choice for care provider
- ❖ To design international center of excellence for selected Super Specialties.
- ❖ Well-being for Patients, customers.

### **Compassion:**

We possess a huge level of patient understanding and we are always compassionate to the patient's requirements. This helps us to provide an excellent standard of patient centered care. We respect our patients, customers & each other & also ensure that their requirements are met with nobility. We always rise to the occasion each time for we recognize the positive social impact we can create.

### **Excellence:**

We are always passionate about achieving the excellent standards of patient care as well as medical expertise. We understand and work upon being the finest as it is a continuous journey of becoming better of ourselves daily.

### **Efficiency:**

We create a responsive healing environment by being lithe to the needs of our patients and delivering the type of service they need. We are fast and focused, practical and personal, seamless and advanced in delivering the care our patients require.

### **Consistency:**

We ensure highest level of patient care and deliver to our commitment. We focus on timely patient needs. We believe only through regularity we can achieve our patient's belief and fulfil our objective.

|                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>Milestone Achieved:</u></b>                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>• <b>2020 Listed on NSE and BSE:</b> Max health Care listed on NSE and BSE.</li> </ul>                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• <b>2017 JCI Accreditation:</b> Max Super Specialty Hospital, Saket is accredited by the Joint Commission International (JCI).</li> </ul>                                                                                                                 |
| <ul style="list-style-type: none"> <li>• <b>2016 Max Institute of Cancer Care, Lajpat Nagar:</b> Max Institute of Cancer Care, a dedicated Cancer Care Day care center opens in Lajpat Nagar in June 2016.</li> </ul>                                                                             |
| <ul style="list-style-type: none"> <li>• <b>2015 Max Smart Super Specialty Hospital, Saket:</b> Saket City Hospital officially becomes Max Smart Super Specialty Hospital, Saket.</li> </ul>                                                                                                      |
| <ul style="list-style-type: none"> <li>• <b>2015 Max Super Specialty Hospital, Vaishali:</b> Push Anjali Cross Lay Hospital officially becomes Max Super Specialty Hospital, Vaishali.</li> </ul>                                                                                                 |
| <ul style="list-style-type: none"> <li>• <b>2014 Max Multi Specialty Hospital, Greater Noida:</b> Max Multi Specialty Hospital, Greater Noida - Secondary Care Hospital in Greater Noida.</li> </ul>                                                                                              |
| <ul style="list-style-type: none"> <li>• <b>2012 Max Super Specialty Hospital, Dehradun:</b> Max Super Specialty Hospital, Dehradun, Max Healthcare opened its first Super Specialty hospital in Uttarakhand in May 2012.</li> </ul>                                                              |
| <ul style="list-style-type: none"> <li>• <b>2011 Max Super Specialty Hospital, Bathinda:</b> Max Super Specialty Hospital, Bathinda- Max Healthcare extended its footprint in North India (in PPP with Govt. of Punjab) in September 2011.</li> </ul>                                             |
| <ul style="list-style-type: none"> <li>• <b>2011 Max Super Specialty Hospital, Mohali:</b> Max Super Specialty Hospital, Mohali- Max Healthcare extended its footprint in North India (in PPP with Govt. of Punjab) in September 2011.</li> </ul>                                                 |
| <ul style="list-style-type: none"> <li>• <b>2011 Max Super Specialty Hospital, Shalimar:</b> Max Super Specialty Hospital, Shalimar Bagh- Max Healthcare Consolidated its position in Delhi &amp; NCR through the launch of its 300 bedded Facility in Shalimar Bagh in November 2011.</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>2009 NABH Accreditation:</b> Max Healthcare receives NABH Accreditation for Blood bank.</li> </ul>                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• <b>2009 D L Shah National Award:</b> Max Healthcare receives D L Shah National Award on 'Economics of Quality' by Quality Council of India.</li> </ul>                                                                                                   |
| <ul style="list-style-type: none"> <li>• <b>2008 Express Healthcare Awards:</b> Max Healthcare receives Express Healthcare Awards for Excellence in Healthcare.</li> </ul>                                                                                                                        |
| <ul style="list-style-type: none"> <li>• <b>2007 Max Healthcare Certification:</b> Max Healthcare receives NABH &amp; NABL certification for its laboratories.</li> </ul>                                                                                                                         |

|                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• <b>2007 Max Hospital, Gurgaon:</b> Max Hospital, Gurgaon - High End Secondary Care Centre in Gurgaon.</li> </ul>                                                                                                    |
| <ul style="list-style-type: none"> <li>• <b>2006 Max Super Specialty Hospital, Saket:</b> Max Super Specialty Hospital, Saket - First Multi, Super Specialty Tertiary Care Location.</li> </ul>                                                              |
| <ul style="list-style-type: none"> <li>• <b>2005 Max Hospital, Patparganj:</b> Max Hospital, Patparganj - 1st Multispecialty Tertiary Care center in East Delhi with 147 Beds, 3 OTs and 1 Cath Lab.</li> </ul>                                              |
| <ul style="list-style-type: none"> <li>• <b>2004 Max Heart &amp; Vascular Institute:</b> Max Heart &amp; Vascular Institute, Saket - First Super Tertiary Care Facility with Advanced Cardiac Life Support Ambulances and Air Evacuation Service.</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>2002 Max Hospital, Noida:</b> Max Hospital, Noida - Focus on Mother and Childcare with Non-invasive Cardiology, Orthopedics, ENT, Ophthalmology, Nephrology etc.</li> </ul>                                      |
| <ul style="list-style-type: none"> <li>• <b>2002 Max Hospital, Pitampura:</b> Max Hospital, Pitampura – First hospital to be ISO certified &amp; became first high-end secondary care in North of Delhi.</li> </ul>                                          |
| <ul style="list-style-type: none"> <li>• <b>2000 Max Med center, Panchsheel Park:</b> Max Med center, Panchsheel Park– First Med center with OP facilities and day care surgeries.</li> </ul>                                                                |
| <ul style="list-style-type: none"> <li>• <b>1985 Max Foundation:</b> Founded in 1985, Max India Limited is a Public Limited company listed in the NSE and BSE with over 37,000 shareholders.</li> </ul>                                                      |

- **Floor Wise Distribution of Departments:**

|                                     |
|-------------------------------------|
| <b>Basement Three (Onco Tower):</b> |
| Reception                           |
| LINAC 1                             |
| CT Stimulator                       |
| Brachy Therapy                      |
| Observation Room                    |
| Change Room                         |
| DU-CU Room                          |
| Nurse Room                          |
| Console Room                        |
| Dosey Lab                           |

|                          |
|--------------------------|
| <b>Lower Basement:</b>   |
| Onco-OPD 2               |
| Onco Day Care            |
| Engineer Office          |
| Chiller Plant Room       |
| Pump Room                |
| Hot Water Generator Room |
| Electrical Plant Room    |
| Physiotherapy            |
| Kitchen Store            |
| Emergency Fresh Air      |
| Emergency Exhaust        |
| DU-CU Room               |
| LSS                      |
| STP                      |
| ETP                      |

|                        |
|------------------------|
| <b>Upper Basement:</b> |
| Security Control Room  |
| EWS Pharmacy           |
| EWS OPD                |
| Linen Room             |
| IP Pharmacy            |
| Staff Changing Room    |
| Gas Manifold           |
| Laundry Room           |
| IP Pharmacy            |
| House Keeping Office   |
| IT Server Room         |
| IT Room                |
| Call Center            |
| EPABX Room             |
| AHU Room               |

|                        |
|------------------------|
| Emergency Fresh Air    |
| Emergency Exhaust      |
| CSSD                   |
| Biomedical Waste Room  |
| House-keeping Store    |
| Dispatch Department    |
| Biomedical Engineering |
| Dietician Room         |
| MRD                    |
| Nursing Office         |
| DU-CU Room             |

|                              |
|------------------------------|
| <b>Managerial Floor:</b>     |
| Air Handling Unit Room (AHU) |
| V.P Office                   |

|                                                                    |
|--------------------------------------------------------------------|
| <b>Ground Floor:</b>                                               |
| Reception                                                          |
| BMR                                                                |
| Electrical Panel Room                                              |
| Console Room                                                       |
| Single-Photon Emission Computerized Tomography Room (SPECT)        |
| Positron Emission Tomography and Computed Tomography Room (PET-CT) |
| Reporting Room                                                     |
| Tumor Board Room                                                   |
| Radio-Pharmacy                                                     |
| Patient Waiting Area                                               |
| Post Admin Waiting Area                                            |
| Radioactive Source Storage                                         |
| Physio Room                                                        |
| Radiologist Room                                                   |
| Treatment Planning System Room (TPS)                               |
| DU-CU Room                                                         |
| Emergency                                                          |
| Reception                                                          |
| Resuscitation Room                                                 |
| CCU                                                                |
| Radiology Area                                                     |
| MRI                                                                |
| CT Scan                                                            |
| Ultrasound                                                         |
| Mammography                                                        |
| X-Ray                                                              |
| Fluoroscopy                                                        |
| International Lounge                                               |

|                         |
|-------------------------|
| Estimate Counter        |
| OPD A, B, C, D Rooms    |
| Waiting Lounge          |
| OPD Pharmacy            |
| Food Express            |
| Nescafe                 |
| Transformer             |
| Onco Reception          |
| Organic Waste Converter |
| LMO                     |
| High Speed Diesel Tank  |
| Treatment Room          |

|                             |
|-----------------------------|
| <b>First Floor:</b>         |
| 7 OT                        |
| Observation Room            |
| OT-Store                    |
| Cath Lab                    |
| Department of Ophthalmology |
| Echocardiogram Department   |
| Tread Mill Test Department  |
| Plastic Surgery Department  |
| Endoscopy Department        |
| CTVS-ICU                    |
| Doctor's Lounge             |
| Technician's Lounge         |
| OPD-E                       |
| High Dependency Unit        |
| DU-CU Room                  |
| Refuse Area                 |

|                                      |
|--------------------------------------|
| <b>Second Floor:</b>                 |
| Neuro ICU                            |
| (PICU) Pediatric Intensive Care Unit |
| (MICU) Medical Intensive Care Unit   |
| (NICU) Neonatal Intensive Care Unit  |
| Dialysis                             |
| Blood Bank                           |
| High Dependency Unit                 |
| Patient Waiting Lounge 1             |
| Patient Waiting Lounge 2             |
| DU-CU Room                           |

|                     |
|---------------------|
| <b>Third Floor:</b> |
| OPD- F              |
| Cafeteria           |

|                 |
|-----------------|
| Kitchen         |
| Path Lab        |
| Microbiology    |
| Doctor's Lounge |
| AHU Room        |
| DU-CU Room      |
| Refuse Area     |

|                               |
|-------------------------------|
| <b>Fourth Floor:</b>          |
| Administrative Block          |
| Seminar Room 1                |
| Seminar Room 2                |
| Critical Care Unit            |
| Surgical Intensive Care Unit  |
| Healing Lounge                |
| Kidney Transplant Unit 1      |
| Kidney Transplant Unit 2      |
| Medical Intensive Care Unit 3 |
| DU-CU Room                    |
| Refuse Area                   |

|                                                                     |
|---------------------------------------------------------------------|
| <b>Fifth Floor:</b>                                                 |
| Labor Delivery Department                                           |
| Labor Suite 1(Labor Room 1)                                         |
| Labor Suite 2(Labor Room 2)                                         |
| Post Labor Room                                                     |
| C-Section OT                                                        |
| Baby Nursery                                                        |
| IPD Rooms (16 Rooms: 8 Single Bed,6 Double Bed, 2 Four Bedded Room) |
| Nursing Station 1                                                   |
| Nursing Station 2                                                   |
| DU-CU Room 1                                                        |
| DU-CU Room 2                                                        |
| Nursing Storeroom 1                                                 |
| Nursing Storeroom 2                                                 |
| Refuse Area 1                                                       |
| Refuse Area 2                                                       |

|                                                                       |
|-----------------------------------------------------------------------|
| <b>Sixth Floor:</b>                                                   |
| IPD Rooms (25 Rooms: 13 Single Bed,10 Double Bed, 2 Four Bedded Room) |
| DU-CU Room 1                                                          |
| DU-CU Room 2                                                          |
| Nursing Room 1                                                        |
| Nursing Room 2                                                        |
| Doctor's Room 1                                                       |
| Nursing Store 1                                                       |
| Nursing Store 2                                                       |

|             |
|-------------|
| Record Room |
|-------------|

|                                                                       |
|-----------------------------------------------------------------------|
| <b>Seventh Floor:</b>                                                 |
| IPD Rooms (25 Rooms: 13 Single Bed,10 Double Bed, 2 Four Bedded Room) |
| DU-CU Room 1                                                          |
| DU-CU Room 2                                                          |
| Nursing Room 1                                                        |
| Nursing Room 2                                                        |
| Doctor's Room 1                                                       |
| Nursing Store 1                                                       |
| Nursing Store 2                                                       |
| Record Room                                                           |
| Refuse Area 1                                                         |
| Refuse Area 2                                                         |

|                                                                      |
|----------------------------------------------------------------------|
| <b>Eighth Floor:</b>                                                 |
| IPD Rooms (25 Rooms: 13 Single Bed,10 Double Bed,2 Four Bedded Room) |
| DU-CU Room 1                                                         |
| DU-CU Room 2                                                         |
| Nursing Room 1                                                       |
| Nursing Room 2                                                       |
| Doctor's Room 1                                                      |
| Nursing Store 1                                                      |
| Nursing Store 2                                                      |
| Record Room                                                          |

|                                                           |
|-----------------------------------------------------------|
| <b>Ninth Floor:</b>                                       |
| 13 Rooms (4 Suite Room,8 Single Room,1 Super Deluxe Room) |
| Nursing Station                                           |
| Nursing Store                                             |
| DU-CU Room                                                |
| Library                                                   |
| Refuse Area                                               |

|                 |
|-----------------|
| <b>Terrace:</b> |
| Lift            |
| Machine         |
| Solar Plant     |
| Pipelines       |

The Hospital is equipped with total 8 lifts i.e., 3 Patient lift, 3 Visitor lift, 1 Doctor's lift and 1 Service lift.

There are around 1100 employees currently working in Max Hospital Shalimar Bagh.

The Max Hospital Shalimar Bagh divides all the employees into 4 main categories:

1. **Physicians/Doctors-** This includes all the Doctors (210 Approx.).
2. **Nursing-** This includes the total number of Nursing Staffs (485 Approx.).
3. **Paramedics-** This category includes the Lab Technicians, OT Technicians, Pharmacists. (126 Approx.).
4. **Support Staff-** All the other employees like Managers, GDA, Housekeeping, Coordinators, Engineers, Administrative Staffs comes under this category (215 Approx.).
5. **Front Office-** They are the first point of contact for the customers for any query and they are responsible for the billing and coordination with the customers (50 Approx.).

## **Project Report**

### **Chapter 1**

#### **Introduction:**

Corona viruses are the big family of virus that cause illness that may be a common cold to any severe disease. It actually infects animals like bats, camels, cattle's etc. But during the end of 2019, Wuhan, a business hub in china experienced an out-break of a novel virus which initially in the first 50 days of epidemic infected over 70,000 individuals and killed more than 800 people. Sooner it rapidly spread across the globe. WHO declared it as a pandemic on 11<sup>th</sup> march 2020? Corona Virus is a pathogenic viral disease which is highly transmittable caused by SARS (severe acute respiratory syndrome) corona virus 2 (Sars-Cov2). It rapidly transfers between humans. This is caused by the close contact with an infected person, by exposure through coughing, respiratory droplets, aerosols and sneezing. The very first case in the country was reported on 30<sup>th</sup> January 2020.

Currently during the second wave India has been reported to have largest number of cases in Asia. During the surge in 2<sup>nd</sup> wave (started from March 2021) in India cases seems to be progressing faster as compared to the first wave surge (that started in mid-September 2020). According to the reports India has been leading the World in average cases registered and detected during the second wave. It was seen that since April 2021 due to covid-19 India has been recording daily highest number of positive cases globally and third highest number of daily deaths. It is considered the reason behind this could be weakened contact tracing system, slow lane of vaccination drive and wide discrepancy that exist between states in the number of vaccine doses to be administered.

During the second wave of Covid 19 it is observed that the spread of virus is at even faster pace in all the age groups as well as there was a very high demand of oxygen. The high demand led to shortage of oxygen thereby putting a pressure on government to use industrial oxygen for patients. No definite effect of anti-viral drug has been known till date. So, the main focus is always symptomatic support. Mostly people show mild to moderate effects during hospitalization, but some show severe complications with poor treatment efficacy during the stay at hospital.

So, the present study includes the LOS (Length of stay of patients) admitted to a hospital based in Delhi, Shalimar Bagh with lab confirmed cases of Covid 19.

#### **Further Insight of Study:**

- This is the study done on Covid patients admitted in max hospital, Shalimar Bagh, Delhi.
- The Admission Data was collected for duration of 35 days from 15<sup>th</sup> April 2021 to 20<sup>th</sup> May 2021
- It has a sample size of 200 patients.
- It mainly focusses on Covid patients with RT PCR tested positive and who had a longer stay in Hospital.

## **Chapter 2**

### **Literature Review:**

The first case of covid-19 was reported in Wuhan, China in December 2019. After which it started spreading to other parts of the world and had a great impact on everybody's life. There are various symptoms seen according to the severity of the disease i.e., a patient may be asymptomatic which mostly are likely to spread the virus although they spread less than symptomatic people or can have common symptoms which includes fever, dry cough or less common symptoms being fatigue, loss of taste and smell, joint pain, myalgia, Headache, vomiting, sore throat, and diarrhea. Some of the serious symptoms can be SOB (shortness of breath) and symptoms that may be suggestive of thrombosis or ischemia such as focal neurological deficiency, angina etc. The pandemic has placed an unprecedented strain on health care. It has speedily increased the call of healthcare worldwide which has become a challenge for health care. The speedily increase of covid 19 occurrence has forced healthcare system to increase hospitalization which in turn has brought healthcare system to breaking point. A fast in flow of emergency admission has brought critical consequences in short span of time.

Everybody is at high probability of getting covid-19 on getting caught to the virus, some may experience severe symptoms and may require hospitalization as well as ICU.

There was a potential impact on resources of health systems. It has increased the demand of healthcare resources like beds, equipment and staff. During the 2<sup>nd</sup> wave of Covid surge it was seen that there was a higher burden of bed occupancy and Oxygen all over. Protruding demand, needs an estimation for how long symptomatic patients of covid 19 needs various levels of hospitalization. The ALOS in ICU is important factor to know the estimation of stability of the healthcare system. For example, hypothesizing an ICU Average length of stay is of 10 days in patients infected with covid 19, the daily probability of bed discharge would be  $1/\text{ALOS} = 1/10 = 0.10$ . That means whenever the required admission rate would go beyond 10% ALOS dependent threshold, the number of beds required/occupied will increase and overwhelm the capacity.

Understanding as well as predicting bed demand in hospital, required staff and equipment provides the main evidence for decision making and contingency planning. Anticipating the requirement of hospital services needs an estimation of the number of patients that requires hospitalization and a rough estimation of how long a patient may require hospital care. The rate of hospitalization can be modelled by estimated epidemic curve. Thus, estimating length of stay (LOS) in hospitals needs observing and examining individual patient pathways. There have been many studies explaining about the prognostic factors for covid, but there is paucity of data when it comes to time of hospitalization in context to the prognostic factors. There are various factors that are responsible for long stay i.e., comorbidity, decrease saturation level etc. Though we have yet not come to know a "cure" for the disease, we have a few drugs that have shown to be successful at least when used early in disease.

COVID-19 had reported different extend of severity in patients. Hospital treatment care can vary care can vary from general ward-based care with no or low flow of oxygen to high dependency units with oxygen support to intensive care where patients might need intubation for mechanical ventilation. So, the LOS may vary according to condition and severity and the requirement of treatment care.

### **Chapter 3**

#### **Research Question:**

- What are the factors responsible for Covid positive patient's recovery / deterioration?
- Was there any specific treatment which could improve chances of recovery?

**Objective of the study:** The motive of the study is to know the factors effecting recovery/ deterioration in the second wave.

#### **Methodology:**

**Study Design:** Retrospective, Observational and Cross-sectional descriptive study.

**Sampling Method:** The method selected for sampling was convenience sampling technique.

**Sample Size:** A total of 200 RT- PCR positive patient was collected.

**Inclusion Criteria:** Patients who tested positive by RT-PCR and were admitted in hospital between 15<sup>th</sup> April 2021 to 20<sup>th</sup> May 2021.

**Exclusion Criteria:** Patient who tested positive by Rapid Antigen test and tested negative with Covid symptoms.

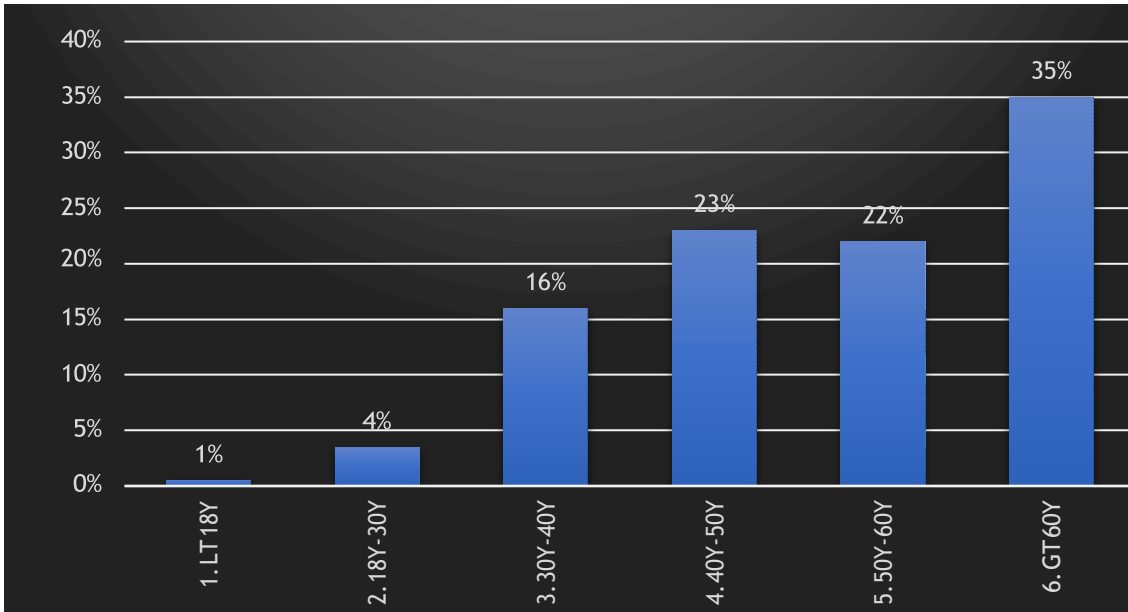
**Tool and Technique used:** The Admission data was collected from HIS and then audited from CPRS notes and was recorded in MS Excel. The data collected includes:

- ❖ SSN ID
- ❖ Age
- ❖ Date of admission
- ❖ Date of discharge
- ❖ Length of stay
- ❖ Discharge status
- ❖ Comorbidity
- ❖ Saturation on admission
- ❖ Patient admitted in
- ❖ Date and day of inj. Remidesivir
- ❖ Date and day of Plasma therapy
- ❖ Date and day of Tocilizumab
- ❖ Diagnosis
- ❖ Complications during stay
  - After collecting the data of 200 people audit was stopped and data was analyzed.

This study was conducted in accord with the declaration of Max Super Specialty Hospital, Shalimar Bagh, Delhi.

## Chapter 4

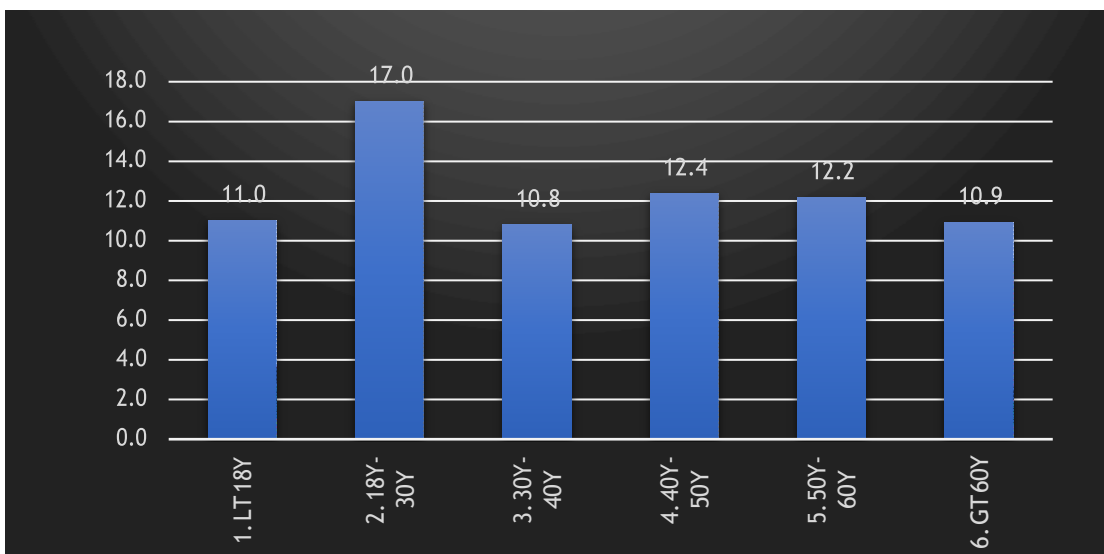
### Findings Of Study and Result:



**Figure 1: Percentage Distribution of Covid Positive patients by age group**

\*LT: Less then, GT: Greater then

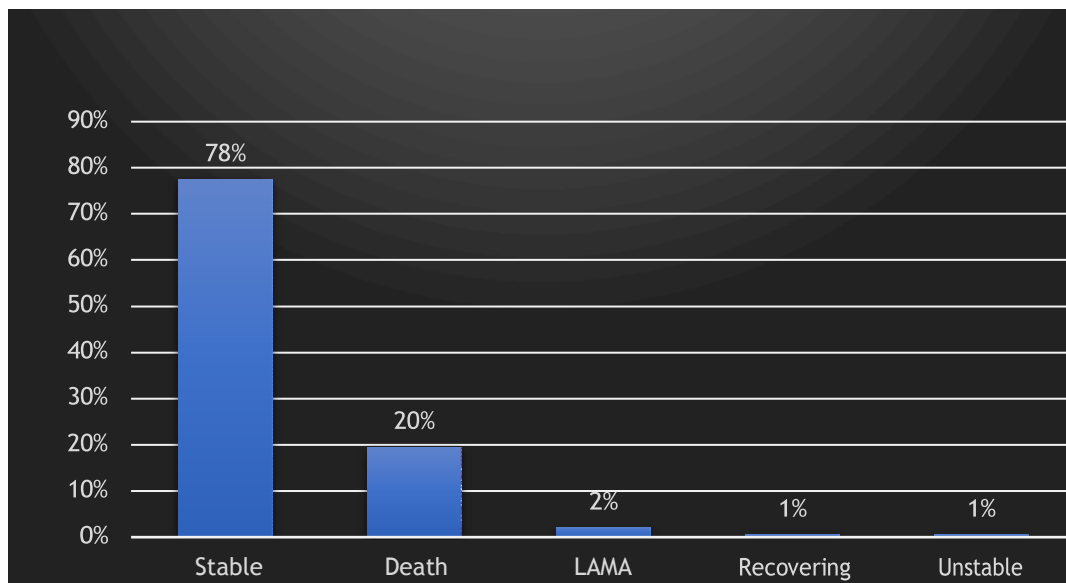
- Majority of the patients who were admitted were in the higher age Brackets.
- Only 5% of the patients who were admitted were under 30 years of age.



## Figure 2: Average Length of Stay by Age Group

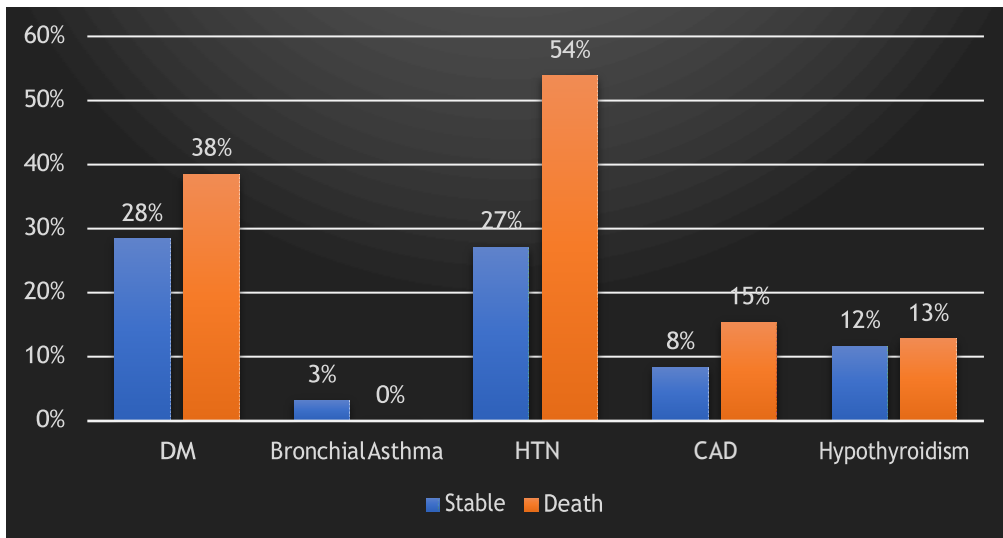
\*LT: Less than, GT: Greater than

- A typical patient's length of stay varies between 10 to 12 days for all age group except 18 to 30 years, but it is significantly higher for the age group of 18 to 30 years. There could be two plausible explanations
  - 1) The second Covid wave was highly devastating for young age group.
  - 2) Only higher age group received vaccination between First and second wave and this effect can be attributed to the vaccination drive.



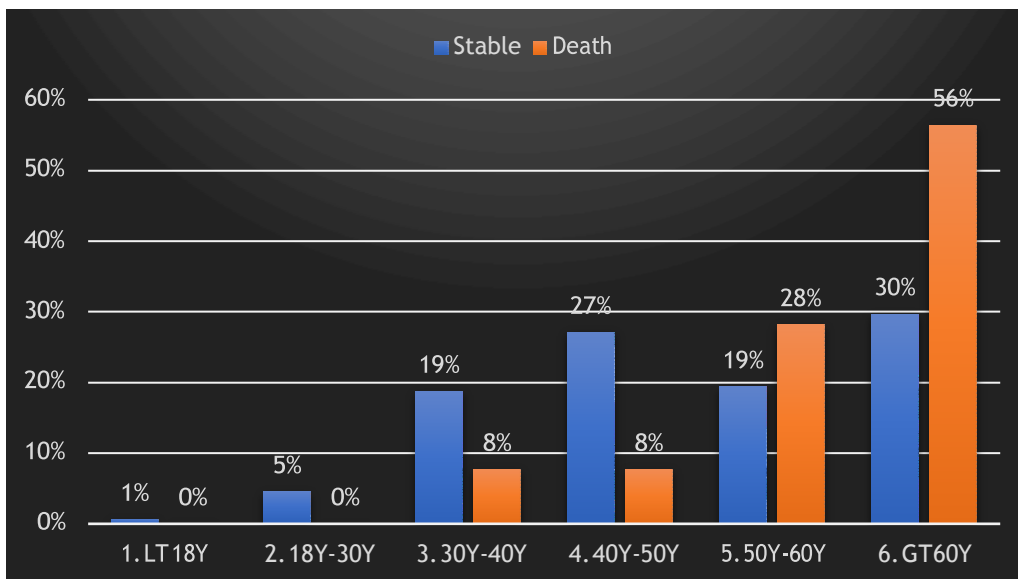
**Figure 3: Percentage Distribution of patients by Discharge Status**

- 78% of patients were stable with treatment however 20% of the patient were succumbed to Death due to Covid.
- Comorbidity is one of the important factors that leads to high fatality rate.



**Figure 4: Percentage Distribution of Discharge status by comorbidity**

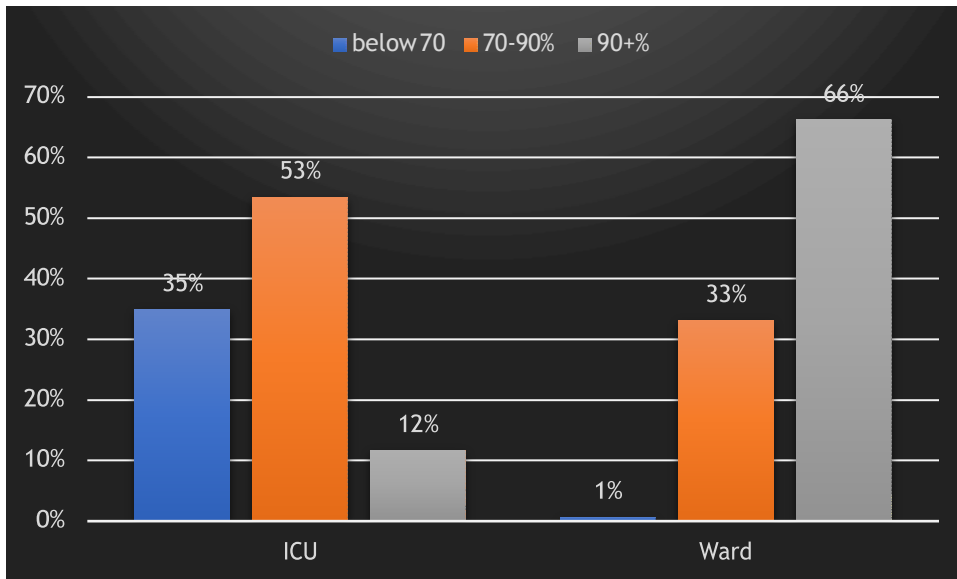
- Data shows Hypertension and Heart related diseases (CAD) increases the fatality rate by 2x.
- Diabetes increases the fatality rate by 10%.
- Hypothyroidism has insignificant impact on fatality rate.



**Figure 5: Percentage Distribution of Discharge status by Age Group**

\*LT: Less then, GT: Greater then

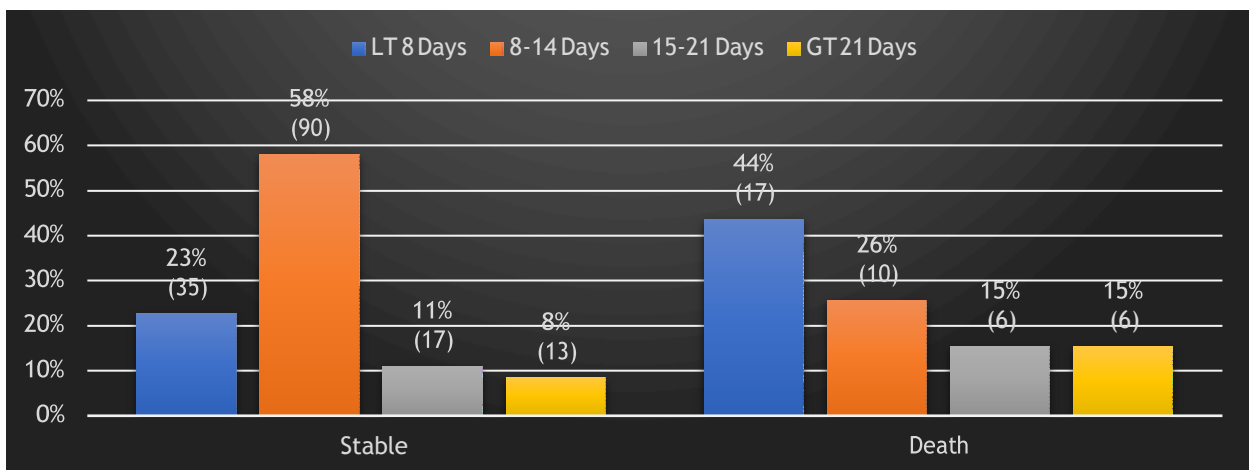
- Patient with age above 60 years experiences 2x fatality rate.
- Patient between the age 50 to 60 years has 9% high chance of fatality.



**Figure 6: Percentage Distribution of Spo2 Level at the time of admission by Facility (Ward/ICU) type**

- 88% of patient admitted in ICU had Spo2 level below 90%
- 34% of patients admitted in ward had Spo2 level below 90%
- Despite having similar Spo2 level the priority has been assigned by age groups and Comorbidities.

(Please refer to Figure from appendices for more details)



**Figure 7: Percentage Distribution of LOS by Discharge Status**

- There were 155 patients who were stable whereas 39 patients seem to be unstable during the hospital stay.
- As we have seen before the average LOS is between 10-12 days.
- 42 patients stayed for more than 2 weeks out of which 12 could not survive.
- The primary cause of death was respiratory failure which was further aggravated by comorbidity leading to 10% higher fatality.

| Discharge Status | Remidesivir | Plasma | Tocilizumab |
|------------------|-------------|--------|-------------|
| Death            | 72%         | 56%    | 38%         |
| Stable           | 65%         | 23%    | 5%          |

**Table 1: Discharge Status on Various Treatment Options**

- From the above data none of the treatment has assured effectiveness against Covid.

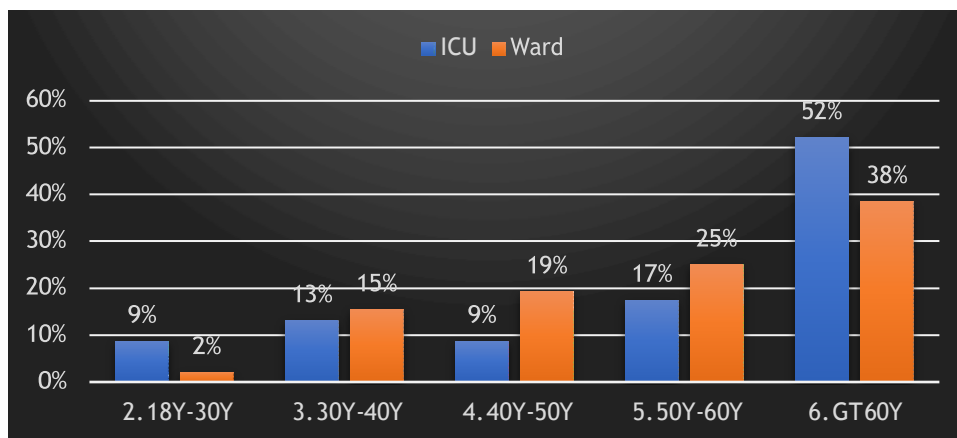
**Conclusion:**

- Age group and comorbidity is seen to be the primary factor responsible for patient's death due to covid.
- Secondary factors that could be considered here are late arrival of patient, shortage of oxygen and bed availability.
- No particular treatment can be considered to have assured results.

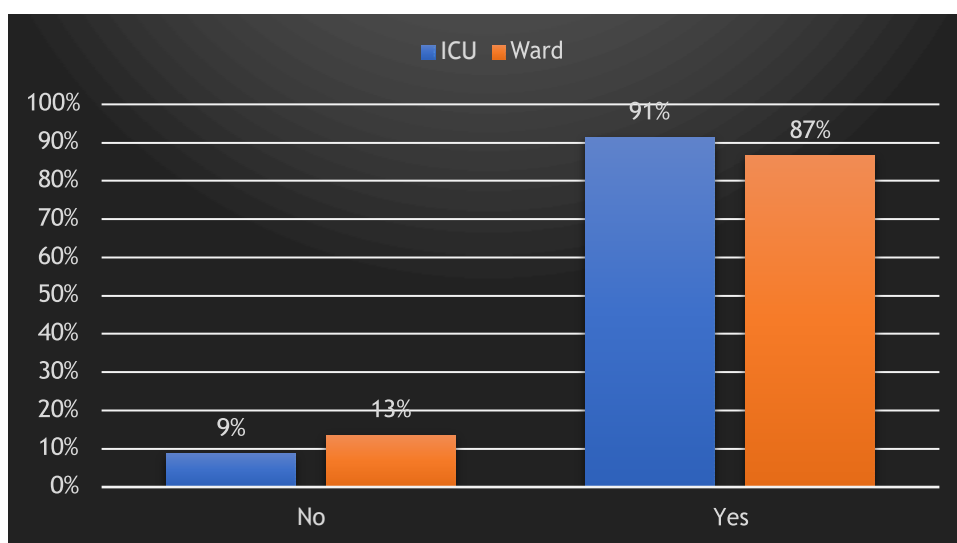
**Recommendations:**

- Increase testing, early detection of disease and timely symptomatic treatment is the only cure for covid disease.
- There should be early arrival to quality medical care.
- We need to improve the overall medical bed capacity at district/national level to tackle this kind of situation in future.
- People should focus more on high-risk hereditary diseases by improving the lifestyles.
- The cause of emergence of second wave (affecting more younger generation) is because of less no. of people got vaccinated in the age group between 18 to 30. So, increasing vaccination could have prevented the disease.

## **Appendices:**



**Figure 8: Percentage Distribution of Facility type by Age group for patients with Spo2 level between 70-90%**



**Figure 9: Percentage Distribution of Facility by Comorbidity for patients with Spo2 level between 70-90%**

**Reference:**

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