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PANDEMIC MANAGEMENT PLAN **Govt Medical College Kozhikode**



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KERALA.HEALTH

**Govt. Medical College
Kozhikode**



**Pandemic Management Plan
2026**

KERALA.HEALTH

Message



Kerala Health has consistently recognised that pandemic preparedness is no longer a standalone activity limited to the health sector, but an essential component of public safety, governance resilience, and sustainable development. The experiences of NIPAH outbreaks, COVID-19 pandemic, emerging zoonotic threats, climate-sensitive diseases, and increasing global interconnectedness have clearly demonstrated that future public health emergencies require continuous preparedness, rapid response systems, and strong institutional coordination. In this context, the preparation of comprehensive Pandemic Preparedness Plans by the Department of Health and Family Welfare marks an important landmark towards strengthening Kerala's health security framework.

Today, pandemic management plans must be viewed through the broader lens of the One Health approach, which recognises the interconnectedness of human health, animal health, environmental systems, and ecological balance. Emerging infections are increasingly influenced by environmental degradation, climate variability, urbanisation, migration, and changing human-animal interactions. Therefore, effective preparedness requires coordinated action not only from the Health and Family Welfare Department, but also from departments including Animal Husbandry, Forests, Local Self Government, Disaster Management, Revenue, Education, Transport, Police, Water Resources, and Civil Supplies. Such interdepartmental convergence is critical for surveillance, risk communication, outbreak containment, logistics management, and continuity of essential services during emergencies.

Kerala has always demonstrated exemplary leadership in responding to public health challenges through timely action, scientific decision-making, community participation, and decentralised governance. The integration of pandemic management with disaster management systems further strengthens our capacity to respond to multiple emergencies simultaneously, including outbreaks occurring during floods, heat waves, or other natural disasters. The development of structured protocols, surveillance mechanisms, escalation frameworks, surge planning systems, infection prevention strategies, and institutional coordination models reflects the state's commitment to building a resilient and future-ready health system.

I am informed that Keralam is the only state where the pandemic preparedness plans have been prepared to such a depth right from the Panchayath level to District

and at institutional level upto Medical Colleges. I place on record my sincere appreciation to all those who worked on this endeavour. The dedication, technical expertise, and coordinated efforts demonstrated by the state and district teams are truly commendable. I am confident that these plans will further strengthen Kerala's capacity to effectively prevent, detect, and respond to future public health emergencies while ensuring the safety and wellbeing of our people.

Shri. K Muraleedharan

Minister for Health and Family Welfare and Devasom,
Government of Kerala



Foreword

Kerala Health has been taking efforts to strengthen the Medical Education. Out of various initiatives such as documentation on Medical College developments giving all the details, preparation of Fact Sheets of DME and MCH giving information regarding the outputs and outcomes, Standard treatment protocol, standardization of the units in the Medical Colleges, one more initiative was taken regarding preparedness for health emergencies such as communicable diseases which could transform into an epidemic/ pandemic. COVID has taught us many lessons. But the moot question is, “What learnings have we taken away from the Pandemic, and its aftermath?” Have we understood those learnings and worked on developing the systems for future scenarios?

And now, I say with immense pride that the through Kerala Health, every Medical College has excellent pandemic management plans in place.

This preparation of pandemic management plans started with the thought of “What new systems do we need to develop across the State?” The Director of Medical Education and senior Doctors from Community Medicine and other Departments took up the challenge of preparation of plans. An elaborate process was followed by conducting state level meetings. Dr Aravind was asked to prepare a template for the Medical Colleges Plans. That template was validated in the state meeting and shared to all the Government Medical Colleges in the State. After that step, a workshop was conducted at Ernakulam Medical College involving all the teams from Medical Colleges as well as from Apex Cancer Centres. Post this workshop, all the institutions took a series of meetings at their level and completed this commendable work.

It is noteworthy to mention here that after Alappuzha, Thrissur also prepared a comprehensive Pandemic management Plan and Festival management Plan. Unfortunately, during this year's Thrissur Pooram preparations, there was a massive fire accident, but the Thrissur MCH team put the Management Protocol in practice and in a short span of time within 8 minutes, they took care of the fire disaster victims and provided exemplary services. While they were handling the incident, thanks to timely preparation and awareness, they were handling hundreds of emergencies not relating to the disaster during that period. This has clearly demonstrated to all that well-prepared planning and capacity building is the key to mitigating problems.

The Kerala Health program has to keep up with changing times, and so, along with the aforementioned initiatives, we discussed with the Digital University of Kerala

(DuK) to develop Kerala Pandemic Management System. This system envisages end-to-end solution for pandemic management. This will make things easy for the functionaries in the health institutions as well as the field functionaries to update the information. Once the pandemic management plans and Festival management plans are done, the teams will begin developing plans for calamities, other disasters and major accidents.

We are also planning mock drills so as to build the capacities of various teams. This way all the Medical Colleges teams will be well trained to manage any eventuality.

I am confident that all Medical Colleges shall institutionalize updating of plans on a yearly basis, skill building, analysis of any emergency handled and based on the analysis do modifications in the plans. This way it will be a dynamic plan of the Medical College.

For any Health System it is very important to have a system to handle any health emergency, and it is with sense of pride one can say that with the coordinated team work, this huge work was done in exemplary way. It also demonstrates that with shared vision and having 'thinking teams' at state, institution and field level can work on many challenges and deliver results. Therefore, these officers who worked on this project hands-on are mentioned right on the cover page! It is a big achievement for the Kerala Health to lay the foundation of Pandemic Management upon which further developments can be easily done.

I wholeheartedly appreciate the work done by one and all for preparing Pandemic Management Plans.

I am confident that all our Medical Colleges will become centre of excellence and earn recognition for their works. I wish all the success for the future endeavours.

Dr Rajan Khobragade IAS

Additional Chief Secretary
Health & Family Welfare and
AYUSH Department
Govt of Kerala.



Message

The health system of Kerala is defined by a mindset of proactive vigilance, a compassionate attitude toward the most vulnerable, and a historic legacy of resilience in the face of public health crises. Our motto for preparedness is simple: to be prepared and proactive is to safeguard the stability and prosperity of our people. This Pandemic Preparedness Plan is not just a technical manual; it is a shared commitment fuelled by the lessons learned from our past encounters with Nipah and COVID-19. These experiences have taught us that rapid mobilization and early detection are our most effective tools in preventing a public health emergency of international concern.

We have designed this strategy to be agile, moving from routine care to emergency surge levels based on real-time data such as ICU occupancy, staff availability, and disease epidemiology. By utilizing advanced diagnostic tools and regional surveillance cells, we aim to identify threats early, ensuring that life-saving interventions begin the moment a patient reaches our doors. Central to this plan is the safety of our workforce; we are committed to providing the training, equipment, and psychological support necessary to prevent burnout and ensure no healthcare worker faces these challenges alone.

Even in the height of a pandemic, our mission to provide essential care for mothers, children, and emergency cases will not waver. Through seamless coordination with district authorities and the private sector, we are building a networked response that maximizes resources for the benefit of every citizen. I am deeply grateful to the faculty and staff whose expertise shaped this document, and I am confident that by following these protocols, we will continue to lead with competence and compassion.

Dr. K. V. Viswanathan

Director of Medical Education
Government of Kerala

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Purpose of Document

This document has been developed to provide a simple, structured guide for preparedness and response within our hospital. It outlines how and when the response will be activated, how resources will be mobilized, how patient care will be organized, and how infection prevention and control measures will be strengthened. It also defines reporting mechanisms, monitoring systems, and strategies to ensure continuity of routine services.

This document provides a structured, practical guide for pandemic preparedness and response at Government Medical College, Kozhikode. It defines activation triggers, command structures, resource mobilization strategies, and operational protocols to ensure rapid, coordinated action during infectious disease outbreaks. The plan is aligned with national and state guidelines and builds upon the institution's experience with COVID-19, Nipah, Mpox and other public health emergencies.

The document explains when and how the hospital will activate its Pandemic Response Plan. It clearly describes the different levels of response based on the seriousness of the situation. This allows the hospital to increase or reduce preparedness measures step by step, depending on the level of risk.

At the same time, it ensures that essential health services continue without interruption during all phases of response.

Definitions & Abbreviations

Term	Abbreviations
CSC	Crisis Standards of Care
DMO	District Medical Officer
EOC	Emergency Operations Center
HFNC	High-Flow Nasal Cannula
HICC	Hospital Infection Control Committee
HPRC	Hospital Pandemic Response Committee
ICD	Institute of Communicable Diseases (attached to GMC Kozhikode)
IDSP	Integrated Disease Surveillance Programme
IHIP	Integrated Health Information Platform
IMCH	Institute of Maternal and Child Health, Kozhikode
IPC	Infection Prevention and Control
KMSCL	Kerala Medical Services Corporation Limited
LMO	Liquid Medical Oxygen
MCH	Medical College Hospital (main campus)
NMCH	Government Medical College Hospital, Kozhikode (main)
OMU	Outbreak Monitoring Unit
PHEIC	Public Health Emergency of International Concern
PPE	Personal Protective Equipment
PSA	Pressure Swing Adsorption (oxygen plant)
RMO	Resident Medical Officer
SOP	Standard Operating Procedure

1. Introduction & Contextual Analysis

Hospitals play a central role during pandemics and other large-scale public health emergencies. Experiences from recent outbreaks have shown that preparedness cannot be developed during a crisis — it must be planned in advance. A clear and practical pandemic preparedness protocol helps the institution respond quickly, protect patients and healthcare workers, and maintain essential health services even during periods of high stress.

1.1 Background & Purpose

Government Medical College, Kozhikode, serves as the apex referral hospital for northern Kerala. With a history of successfully managing Nipah virus outbreaks (2018, 2021, 2023), the COVID-19 pandemic, and emerging threats such as Monkeypox, the institution has developed a robust culture of preparedness. This plan aims to enable rapid response within the first week of any potential Public Health Emergency of International Concern (PHEIC) by activating pre-defined structures and ensuring seamless coordination.

1.2 Institutional Geography

The institution comprises three major campuses:

- **MCH (Main Campus):** Adjacent to National Highway 66; 3 km from Kozhikode Railway Station and 6 km from the city centre.
- **IMCH (Institute of Maternal and Child Health):** Located on the same campus, with dedicated entry.
- **ICD (Institute of Communicable Diseases):** Situated within the main hospital complex, with separate access to facilitate isolation.

Wide road accessibility allows for dedicated ambulance corridors, and the proximity to Kozhikode International Airport (Karipur, 25 km) makes the hospital a key entry point for imported or emerging infections.

1.3 District-Specific Risk Profile

Kozhikode district is prone to:

- **Zoonotic threats:** Nipah virus (recurrent outbreaks), leptospirosis, and scrub typhus.
- **Vector-borne diseases:** Dengue, malaria, and chikungunya, with seasonal surges.
- **High population density and migrant labour influx:** Increases risk of rapid transmission.
- **Urban-rural interface:** Proximity to forested areas (Western Ghats) heightens risk of zoonotic spillover.

1.4 Previous Experience in Outbreak Management

Our institution has significant experience in managing infectious disease outbreaks and public health emergencies. Over the years, we have developed and implemented specific Standard Operating Procedures (SOPs) and ensured coordinated action across departments whenever new health threats emerged.

1.4.1 COVID-19 Pandemic Response

During the COVID-19 pandemic, the institution:

- Developed clear SOPs for screening, triage, isolation, and patient management.
- Set up dedicated COVID care areas with strict infection prevention and control (IPC) measures.
- Strengthened laboratory coordination and timely reporting systems.
- Implemented pandemic-specific biomedical waste management protocols.
- Conducted regular training programs for healthcare workers on PPE use, triage, and emergency response.
- Ensured that essential non-COVID health services continued without major disruption.
- Identified Gaps and decided on escalation strategies.

1.4.2 Nipah Outbreak Response

During the Nipah outbreak, the institution:

- Activated emergency outbreak response protocols immediately.
- Implemented strict infection control practices, including isolation and barrier nursing.
- Coordinated closely with public health authorities for surveillance and contact tracing.
- Ensured timely risk communication within the institution and with external agencies.
- Conducted simulation exercises to improve preparedness and response capacity.

1.4.3 Monkeypox Preparedness and Response

In response to Monkeypox alerts, the institution:

- Implemented screening protocols based on standard case definitions.
- Established isolation facilities as per national guidelines.
- Conducted training sessions for doctors and nursing staff.
- Strengthened specimen collection, handling, and referral systems.
- Initiated awareness and risk communication activities for staff and patients.

1.5 Institutional Preparedness Culture

Preparedness is an ongoing process in the institution. This is ensured through:

- Regular training and refresher sessions for staff across departments.
- Periodic interdepartmental coordination meetings during outbreak alerts.
- Continuous updating of protocols based on the latest national and state guidelines.
- Inclusion of outbreak preparedness as part of routine administrative review and planning processes.

This experience and culture of preparedness form the foundation for the present pandemic preparedness protocol.

1.6 Scope & Objectives

The main aim of this plan is to ensure that the hospital is prepared to respond in a structured, coordinated, and efficient manner during infectious disease outbreaks and public health emergencies.

1.6.1 Optimal Use of Resources

The plan ensures proper and timely use of available resources, including:

- Human resources (doctors, nurses, laboratory staff, administrative and support staff)
- Infrastructure (isolation wards, ICU beds, triage areas)
- Medical equipment (ventilators, oxygen systems, monitors)
- Personal Protective Equipment (PPE) and essential supplies
- Financial and logistical support systems

1.6.2 Clear Roles and Responsibilities

The plan clearly defines the responsibilities of each department during preparedness and response phases, including:

- Clinical departments
- Microbiology and laboratory services
- Infection Prevention and Control (IPC) team
- Nursing services
- Biomedical waste management team
- Hospital administration
- Public health and surveillance units
- Security and support services

1.6.3 Defined Command and Communication Structure

The plan establishes a clear leadership and decision-making structure during emergencies.

It:

- Identifies who is in charge during different phases of response
- Defines reporting and communication channels
- Establishes escalation procedures
- Enables quick decision-making
- Ensures coordination with district and state health authorities

1.6.4 Strengthening Institutional Capacity

Preparedness is strengthened through

- Regular training and refresher programs
- Mock drills and simulation exercises
- Infrastructure strengthening
- Development and regular updating of SOPs
- Risk assessment and gap analysis
- Ongoing monitoring and evaluation

1.6.5 Continuity of Essential Health Services

The plan ensures that essential non-pandemic services continue safely during outbreaks.

This includes:

- Protecting vulnerable patient groups
- Continuing maternal, emergency, and chronic disease services
- Preventing avoidable illness and deaths due to service disruption

1.6.6 Institutionalizing Preparedness

- Regular review meetings

- Proper documentation of outbreak experiences
- Learning from past events and updating protocols
- Building long-term resilience for future public health emergencies

Overall, this plan aims to ensure that the institution remains prepared, organized, and resilient in the face of any future pandemic or emerging health threat.

2. Governance & Command Structure

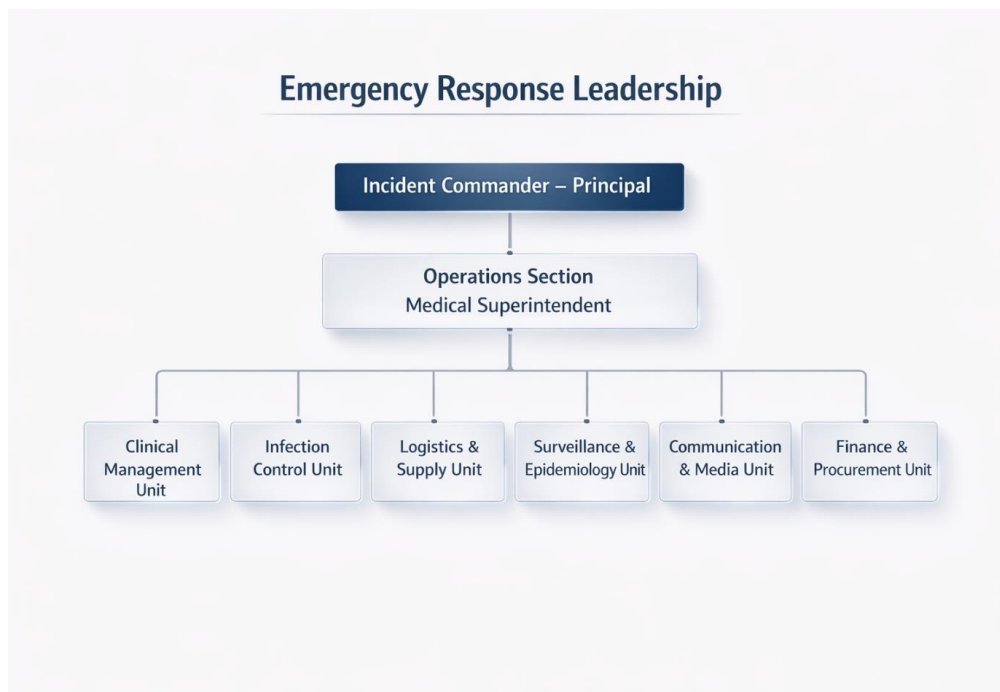


Fig 1: Emergency Response Leadership

2.1 Hospital Pandemic Response Committee (HPRC)

The HPRC is the apex decision-making body for pandemic preparedness and response.

Role	Designation
Chairperson	Principal, GMC Kozhikode
Co-Chairperson	Medical Superintendent, GMC Kozhikode
Core Members	Head of General Medicine, Emergency Medicine, Pulmonology, Paediatrics, Community Medicine, Microbiology; Nursing Superintendents; RMO; Nodal Officers

The HPRC meets at least quarterly during routine periods and daily during activation.

2.2 Multidisciplinary Team

A multidisciplinary team supports the HPRC with functional responsibilities:

Team	Core Duties
Clinical Management Unit	Led by HOD Medicine, Paediatrics, Emergency Medicine, Pulmonology/ Respiratory Medicine; oversees triage, admission, treatment protocols, and discharge.
Infection Control Team	HICC (see 2.4) ensures IPC compliance, training, and surveillance of healthcare-associated infections.
Logistics & Supply Team	Manages procurement, inventory, and distribution of PPE, oxygen, ventilators, and essential drugs.
Surveillance & Epidemiology Unit	Led by HOD Community Medicine; RPEID cell; monitors case trends, liaises with DMO and IDSP, and manages contact tracing.
Communication & Media Unit	Designated spokesperson; coordinates internal and external communication.
Finance & Procurement Unit	Handles emergency purchases and financial approvals.

2.3 Outbreak Monitoring Unit (OMU)

The OMU is a specialized cell activated during alerts to:

- identify emerging/re-emerging infections, strengthen triage, and facilitate rapid diagnosis.
- Initiate coordinated surveillance activities
- Monitor case trends and epidemiological patterns
- Ensure real-time reporting to district surveillance unit

- Coordinate containment and contact tracing measures
- Review laboratory confirmation timelines
- Support evidence-based decision-making

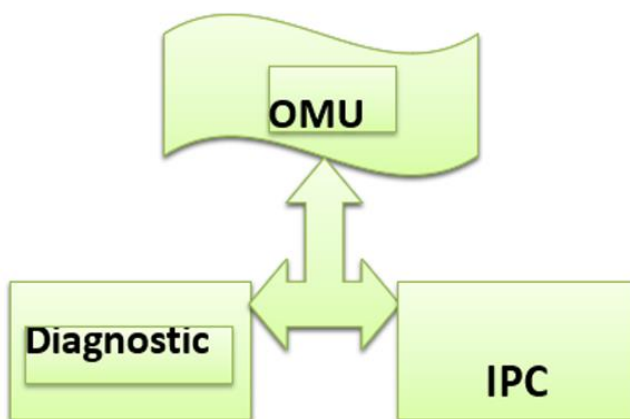


Fig 2 : Outbreak Monitoring Unit

Composition of OMU

Sl.No	Position in the committee	Designation
1	Convenor	Medical Superintendent
2	Member	Deputy Medical Superintendent
3	Member	RMO
4	Member	Associate Professor Medicine
5	Member	Associate Professor Pediatrics
6	Member	HOD Community Medicine

7	Member	Associate professor-Microbiology
8	Member	RPEID cell Coordinator
9	Member	Associate professor-Pathology
10	Member	Professor Forensic Medicine
11	Member	Deputy Nursing Superintendent

2.4 Hospital Infection Control Committee (HICC)

The HICC oversees all infection prevention activities and meets regularly (22 meetings in 2025; 276 IPC trainings conducted).

Administrative control		
1	Chairperson	Dr. K.G. Sajeethkumar, Principal
2	Member Secretary	Dr. Anitha P.M., HOD Microbiology
Hospital Infection Control Team (Core Committee)		
1	Medical Superintendent	Dr. Sreejayan (NMCH), Dr. Arunpreeth (IMCH), Dr. Suraj (ICD), Dr. Rajeevan (PMSSY)
2	CMO	Dr. Sanal Chottu
3	Infection Control Officer	Dr. Mini P.N. (Clinical Microbiologist)
4	ID physician	Dr. Aquil Kalanad, General Medicine
5	Infection control Nurses	Smt. Saraswathi, Smt. Rathisha, Smt. Shanti, Smt. Annie (IMCH)

6	Infection control lab technician	Mr. Salim K.K.
7	Data entry operator	Smt. Tintu.K
Other Members		
	Deputy HICO	Dr. Pressy Sankar, Dr. Nubila Fayaz, Dr. Vishnu, Dr. Unni Raja
	Head of Departments	Medicine, Surgery, Orthopaedics, OBG,Pediatrics, Emergency Medicine, Pharmacology
	Tertiary Cancer Centre	Dr. Ajay Kumar (HOD Radiotherapy)
	ICTC Nodal officer	Dr. Maya Sudhakaran (Microbiology)
	TB Nodal officer	Dr. Anjana Babu A.P. (ICD)
	Chief Nursing Officer	Smt. Treasa
	Officer in-charge, BMWM	Mr. Diyu
	Epidemiologist	Dr. Asma
	NSI Reporting Officer	Dr. Aquil. K, Dr. Kripesh, Dr. Jijy

Support Services		
Sl. No	Department	Officer In-charge
1	OT Complex	Dr. Radha (HOD Anaesthesia)
2	CSSD	Dr. Vaisakh
3	Linen/Laundry	Dr. Vaisakh
4	Housekeeping	Mr. Diyu
5	Kitchen	Mrs. Anitha, SNO
6	Pharmacy	Dr. Vinaya O.G. (HOD)
7	BMW Engg	Mrs. Indira
8	Engg (KWA)	Mr. Vinod
9	Store	Mr. Pradeep
10	Health Supervisor	Mr. Diyu
11	RMO	Dr. Nikhil
Meetings and trainings in 2025		
1	HICC Meetings	2
2	IPC Trainings	276

3. Situational Analysis & Resource Mapping

3.1 Infrastructure Audit

The following table reflects current infrastructure (preference given to PPT data, updated March 2026)

Human Resources	Count	Infrastructure	Count
Professor	58	Bed Strength [Yellow zone]	43
Associate Professor	78	Bed Strength [Red zone]	13
Assistant Professor	322	EDICU Beds	9
Lecturer	12	Total allotted bed [MCH + IMCH]	2319 + 740 = 3059
SR + JR	66 + 630	Total no of single rooms [MCH + IMCH]	65 + 60 = 125
House Surgeons	250	Total ICU bed [MCH + IMCH]	146 + 46 = 192
Chief Nursing officer	2	Total ventilators [MCH + IMCH]	146 + 46 = 192
Nursing superintendent	4	Total oxygen beds [MCH + IMCH]	1766 + 105 = 1871
ICN	4	LMO [MCH + IMCH]	24KL + 2 KL
Senior Nursing officer	140	Oxygen generator plant	960 L/M, 4 Nos
Nursing officer	768	D type cylinder [MCH + IMCH]	330 + 90 = 420
Nursing assistants	315	B type cylinder [MCH + IMCH]	376 + 36 = 416

Grade 1 staff	138	HFNC [MCH + IMCH]	$14 + 15 = 29$
Grade 2 staff	168	Ambulance [MCH + IMCH]	$3 + 3 = 6$

3.3 Equipment & Logistics (Baseline Buffer)

- **PPE:** 14-day buffer for full surge
- **Oxygen:** PSA plant capacity 960 L/min; backup cylinders (420 D-type) provide additional 48-hour reserve.
- **Medicines:** Emergency drug reserve for 10–14 days at full occupancy.

4. Graduated Response Framework (Three-Tier Model)

The institution adopts a **three-tier escalation model** (Conventional → Contingency → Crisis) with quantifiable triggers, aligned with the **Green-Amber-Red** surge phases.

4.1 Escalation Triggers & Phases

Activation Level	Epidemiological Situation	Measurable Triggers	Key Operational Actions	Command Status	Reporting Frequency
Level 0 Routine Surveillance (Conventional)	No institutional cases; global/national alerts	• No confirmed institutional case • Stable ILI/SARI trends • Adequate PPE & oxygen buffer (>14 days)	• Enhanced surveillance • SOP review • PPE & oxygen audit • Training refreshers • Mock drills	Infection Control Committee monitoring	Weekly
Level 1 Alert Mode (Contingency)	Confirmed cases in district/state OR risk of importation	• ≥1 suspect case in institution • District outbreak notification • Rapid rise in ILI over 3 days	• Activate Pandemic Task Force • Operationalize screening & triage • Prepare isolation rooms • Daily review meetings • Staff advisory issued	ICS partially activated	Daily
Level 2 Partial Activation (Contingency)	Confirmed institutional cases;	• ≥50% isolation bed occupancy	• Dedicated isolation wards	Full ICS activated	Daily

	localized transmission	• $\geq 30\%$ rise in new admissions (3 days) • $\geq 10\%$ workforce unavailable	• Cohorting of cases • Rational manpower deployment • Restrict visitors • Daily SitRep		
Level 3 Full Activation (Crisis)	Sustained transmission; major surge	• $\geq 60\%$ cumulative pandemic bed occupancy • ICU occupancy $\geq 70\%$ • Oxygen utilization $\geq 60\%$ • Ventilator use $\geq 75\%$	• Activate surge phases • Convert additional wards • Workforce restructuring • Oxygen surge management • Dashboard review (6-hourly)	Emergency Operations Center active	Twice daily / 6-hourly
Level 4 Crisis Mode	Demand exceeds capacity; system overload	• ICU occupancy $> 90\%$ • Oxygen utilization $> 80\%$ • Workforce depletion $> 20\%$ • No surge beds available	• Crisis standards of care • Temporary care areas • Inter-facility transfers • Emergency procurement • External resource mobilization	Direct coordination with district/state	6-hourly / Real-time

Phase	Action	Capacity Activated
GREEN LEVEL – Phase 1 <i>(Conventional)</i>	Conversion of designated pay wards into pandemic care areas.	NMCH KHRWS Pay Ward: 65 beds IMCH Pay Ward: 60 beds Total: 125 beds
AMBER LEVEL – Phase 2 <i>(Contingency)</i>	Activated if $\geq 50\%$ of Phase 1 beds occupied OR $\geq 70\%$ isolation occupancy OR $\geq 30\%$ rise in admissions.	NMCH Wards 39-42, Hematonco & Geriatric: 528 beds IMCH: 100 beds Total: 628 beds
RED LEVEL – Phase 3 <i>(Crisis)</i>	Activated if $\geq 60\%$ of Phase 1+2 beds occupied OR ICU occupancy $\geq 70\%$ OR O2 utilization $\geq 60\%$.	NMCH Wards 1-4, 13-20, Psychiatry: 422 beds IMCH: 450 beds Total: 872 beds

4.2 ICU & Ventilator Surge

Phase	ICU Bed Capacity (NMCH)	Ventilator Capacity
Phase 1	2	2
Phase 2	15 (including Transit ICU)	15
Phase 3	30	30

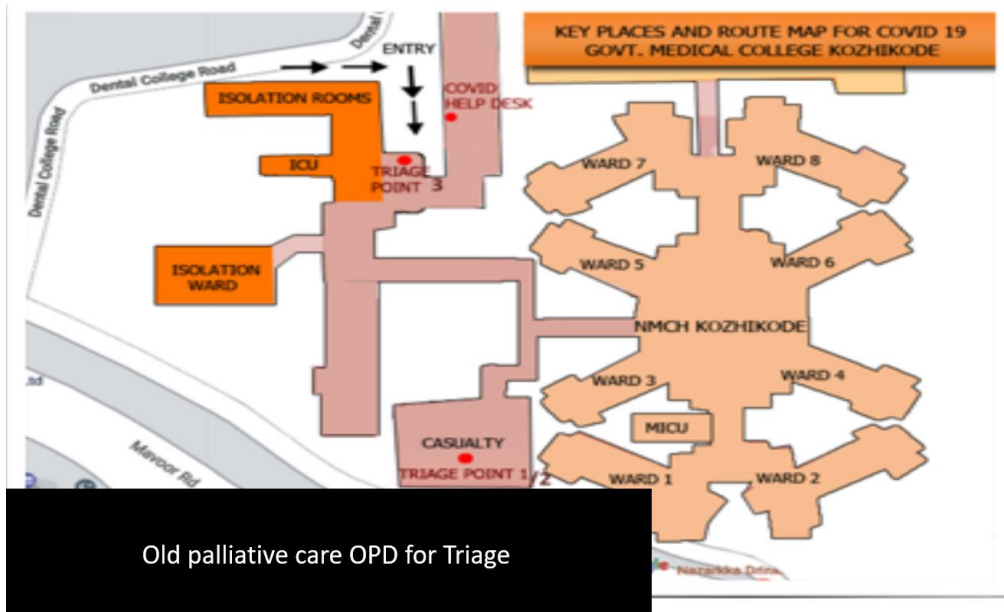
4.3 Critical Triggers (ICU & Workforce)

- **ICU-Specific:** Daily oxygen consumption exceeds 60% of PSA plant capacity; projected 5-day oxygen requirement exceeds reserve buffer.
- **Workforce:** $\geq 10\%$ clinical workforce unavailable due to illness/quarantine; nurse-to-patient ratios exceed safe limits.

4.4 Operational Goals per Tier

- **Tier 1 (Conventional):** Maintain standard of care, preserve elective services.

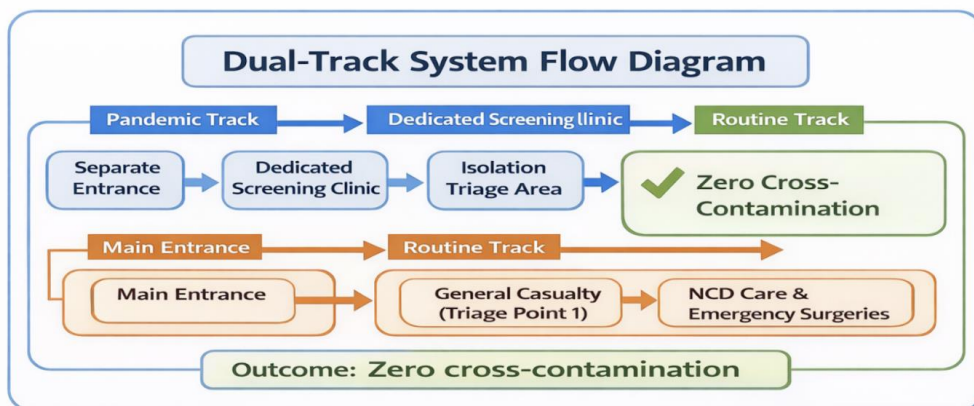
- **Tier 2 (Contingency):** Adapt space, staff, and supplies to maintain functionally equivalent care.
- **Tier 3 (Crisis):** Maximize population benefit under extreme resource scarcity; activate Crisis Standards of Care (CSC).



5. Operational Standard Operating Procedures (SOPs)

5.1 Triage & Red Channel Protocol

- **Dual-stream triage** at casualty and OPD entries: separate pathways for ILI/SARI cases.

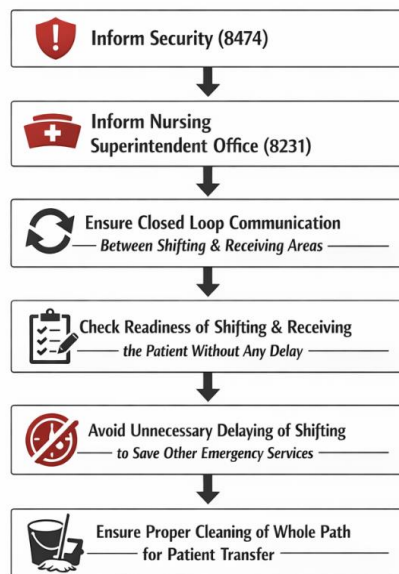


Red channel protocol and flow chart

- Operation of red channel guidelines for transporting suspected/positive pandemic cases among different departments of MCH, Trivandrum
- Inform security officer in charge regarding the opening of red channel as per the order of Medical Officer in charge.
- Inform the same to Nursing Officer in charge and ICN.
- Arrange PPE kit to ambulance driver.
- The staff who are going to receive the patient must wear PPEs and keep ready the trolley
- All items or drugs needed should be communicated over phone and must be ready.
- Accompanying staff must wear PPE if the patient is positive, he/she should wear PPE, otherwise he/she should wear N95.

- For ICU patients on ventilators, at least cover the patient with surgi kit/drape.
Ensure the availability of NRBM [Non-rebreather mask] for transport.
- Lift operator must be ready with PPE.
- Lift should be blocked and passengers must be restricted till the staff/patient returns.
- After shifting the patient, lifts/trolley should be cleaned by attenders with 1% hypochlorite solution.
- Shifting area or reviewing area trolleys must be thoroughly washed with 1% hypochlorite
- Ensure the doffing of ambulance driver and cleaning of the ambulance.
- Ensure proper recording of shifting/red channel
- Ensure closed loop communication in each step so that there is no delay in the whole process.

RED CHANNEL FLOW CHART



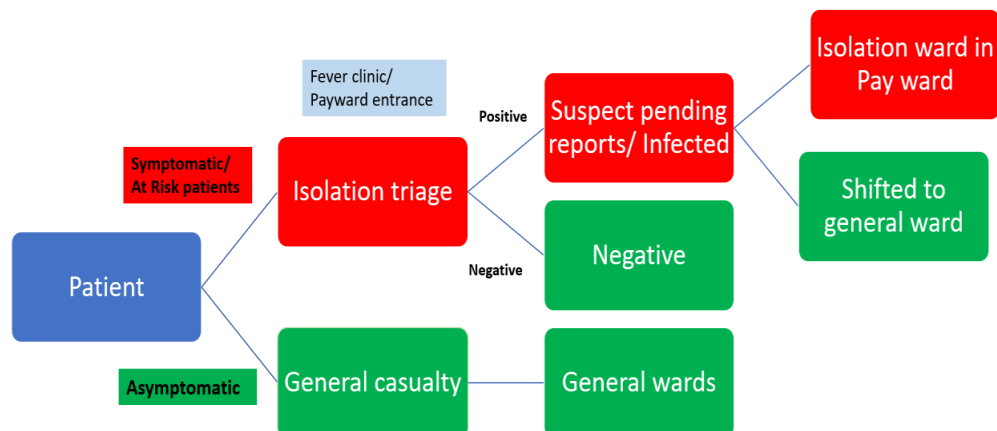


Figure 3. Zoning and segregation plan in place during the past NIPAH and Mpox outbreaks

5.2 Patient Care Equipment

- Dedicated equipment for isolation areas (stethoscopes, BP apparatus).
- Reprocessing: heat-stable items via autoclave; heat-sensitive items via ETO.
- PPE for reprocessing staff as per HICC guidelines.

5.3 Infection Prevention & Control (IPC)

- Hand hygiene and cough etiquette protocols (IPC manual).
- Mandatory donning/doffing training for all staff, including housekeeping and drivers.
- Daily monitoring of healthcare worker safety (occupational exposure reporting).

5.4 Environmental & Engineering Controls

- Negative pressure rooms: maintained in ID block and selected ICU areas.
- Air changes per hour (ACH): target 12 ACH for airborne infection isolation rooms (AIIRs).
- HEPA filtration in designated areas.

5.5 Makeshift Isolation Enclosures

- Temporary cubicles/tents with localized negative pressure (portable HEPA units) to be deployed if isolation capacity is exceeded.

5.6 COVID/Pandemic Operation Theatre

- Conversion of re-circulatory HVAC to 100% once-through systems with independent exhaust blowers for pandemic surgeries.
- Coordination with HOD Anaesthesia and Biomedical Engineering.

6.Specialized Service Guidelines

6.1 Testing frequency (e.g., every 10 days),

surface disinfection, and staff PPE requirements. (Added as Annexures)

6.2 Management of Deceased:

Handling protocols (Standard Precautions), plugging orifices, 1% hypochlorite bag disinfection, and family counselling (Added as Annexures).

6.3 Maternal & Child Health

Specific admission/transfer rules if both mother and child are admitted.

7. Logistics and ancillary services

7.1 Supply Chain Management

- Supply chain resilience is central to preparedness. Hospitals must maintain buffer stocks of essential consumables, drugs, oxygen, and PPE, with automated inventory systems for real-time tracking. In Kerala, the integration of hospital logistics with the Kerala Medical Services Corporation (KMSCL) ensures rapid procurement and equitable distribution during crises. Biomedical equipment maintenance schedules must remain updated, and contingency plans should address disruptions in power, communication, and waste management systems. Setting up modular field hospitals or isolation extensions should be a pre-approved measure for extreme surges.

7.2 Linen & Laundry

- Details Added as Annexure

7.3 Biomedical Waste Management

- Details Added as annexures

7.4 Support Services

- **Dietary:** Coordination with Local Self-Government Department (LSGD) for mass feeding if needed.
- **Psychological Support:** Psychiatry department provides counselling helpline and proactive rounds for staff and patients.
- **Social Work:** Assists with family communication and discharge planning.

7.5 Essential Supplies

- Personal Protective Equipment (PPE)
- N95 masks, gloves, face shields
- Oxygen cylinders and concentrators
- Ventilators and monitoring devices
- Essential drugs and emergency medications

- Disinfectants and sanitation supplies

7.6 Inventory Control Mechanism

- Centralized stock monitoring system
- Minimum stock threshold alerts
- Daily consumption reporting
- Emergency procurement procedures
- Vendor coordination and supply chain backup

8. Communication, Monitoring & Research

8.1 Surveillance Systems

- Epidemiologic surveillance through RPEID cell.
- Integration with **IHIP**, **IDSP**, and **ICMR** reporting platforms.
- Daily situation report (SitRep) during activation.

8.2 Media & Risk Communication

- **Designated spokesperson:** Principal or Medical Superintendent.
- Accurate, timely updates; no individual departmental media statements.
- Designated location for media briefings to avoid disruption of clinical areas.

8.3 Control Room Operations

A 24×7 Control Room shall function during activation phases to:

- Maintain updated bed availability dashboard
- Track oxygen consumption
- Monitor manpower deployment
- Coordinate ambulance movement
- Maintain emergency helpline

8.3.1. Internal Communication:

- Daily situation briefings
- Control room reporting system
- Departmental escalation protocol

8.3.2. External Communication:

- District Surveillance Unit
- State Health Directorate
- National reporting systems

- Media communication through authorized spokesperson only

8.4 Research Collaboration

- Institutional Medical Board, Institutional Research Committee (IRC), Institutional Ethics Committee (IEC), reviews and approves clinical trials/observational studies.
- Collaboration with veterinary/environmental science departments for zoonotic surveillance.

9. Recovery & De-escalation

Once pandemic activity declines:

- HPRC will review epidemiological data
- Conduct post-activation audit
- Document lessons learned
- Revise SOPs accordingly

9.1 Discharge & Back Referral

- Criteria for de-escalation: bed occupancy < 40% for 7 consecutive days, ICU occupancy < 50%, sustained decline in admissions.
- Mild/moderate cases referred to Taluk or District hospitals as per state policy.
- Post-discharge follow-up coordinated with community health workers.

9.2 Financial Plan

- Dedicated **Emergency Response Fund** under the Principal's office for rapid procurement.
- Advance approval for emergency purchases up to a pre-determined limit.

9.3 After-Action Reviews

- Formal review meeting within 4 weeks of de-escalation.
- Policy audits, gap analysis, and SOP updates documented and circulated.
- Lessons learned incorporated into the next version of the plan.

Annexures

Annexure: 1- Pandemic Escalation Matrix

Activation Level	Epidemiological Situation	Measurable Triggers	Key Operational Actions	Command Status	Reporting Frequency
Level 0 Routine Surveillance	No institutional cases; global/national alerts	• No confirmed institutional case • Stable ILI/SARI trends • Adequate PPE & oxygen buffer (>14 days)	• Enhanced surveillance • SOP review • PPE & oxygen audit • Training refreshers • Mock drills	Infection Control Committee monitoring	Weekly
Level 1 Alert Mode	Confirmed cases in district/state OR risk of importation	• ≥1 suspect case in institution • District outbreak notification • Rapid rise in ILI over 3 days	• Activate Pandemic Task Force • Operationalize screening & triage • Prepare isolation rooms	ICS partially activated	Daily

			• Daily review meetings • Staff advisory issued		
Level 2 Partial Activation	Confirmed institutional cases; localized transmission	• $\geq 50\%$ isolation bed occupancy • $\geq 30\%$ rise in new admissions (3 days) • $\geq 10\%$ workforce unavailable	• Dedicated isolation wards • Cohorting of cases • Rational manpower deployment • Restrict visitors • Daily SitRep	Full ICS activated	Daily
Level 3 Full Activation	Sustained transmission; major surge	• $\geq 60\%$ cumulative pandemic bed occupancy • ICU occupancy $\geq 70\%$	• Activate surge phases • Convert additional wards • Workforce restructuring	Emergency Operations Center active	Twice daily / 6-hourly

		• Oxygen utilization $\geq 60\%$ • Ventilator use $\geq 75\%$	• Oxygen surge management • Dashboard review (6-hourly)		
Level 4 Crisis Mode	Demand exceeds capacity; system overload	• ICU occupancy $> 90\%$ • Oxygen utilization $> 80\%$ • Workforce depletion $> 20\%$ • No surge beds available	• Crisis standards of care • Temporary care areas • Inter-facility transfers • Emergency procurement • External resource mobilization	Direct coordination with district/state	6-hourly / Real-time

Annexure II: Operational Teams and Functional Responsibilities

Team	Core Duties	Operational Status / Remarks
Nodal Officer and Deputies	Lead and coordinate institutional pandemic response	Functional team constituted during Nipah and COVID outbreaks; reconstitution planned
Scientific Team / Institutional Medical Board	Establish guidelines, SOPs, and treatment protocols	Functional; reconstitution planned
Clinical Response Team	Implement patient care protocols and clinical management pathways	In place
Infection Control Team	Monitor and enforce infection prevention and safety protocols	Functional
Logistics and Supply Team	Procurement, stock monitoring, and distribution of medical supplies	Active; integrated with surge plan
Control Room	Coordinate internal and external communication; maintain dashboard	Operational during activation
Contact Tracing Team	Trace and monitor contacts; support surveillance	Activated during outbreak phases
Post Mortem System	Ensure safe handling and disposal of deceased as per infection control norms	Functional; previously activated during Nipah and COVID outbreaks

Annexure III : Resource Mobilization plan for Pandemic Response

Annexure III A: Human Resource Deployment Structure

Functional Group	Composition	Key Responsibilities	Reporting To	Activation Level
Core Leadership Group	Principal/Dean, Medical Superintendent, Specialty Hospital Superintendents, Nodal Officers, HODs	Strategic decision-making, activation/deactivation of plan, liaison with district/state authorities, policy approval	Governing Body / State Health Authority	Level 1-4
Administrative Group	Implementation Committee, HR Unit, Accommodation & Welfare Unit	Staff scheduling, accommodation, welfare services, coordination meetings, documentation	Incident Commander	Level 1-4
Direct Patient Care Group	Triage Teams, Isolation Ward Teams, ICU Teams, Testing Teams	Admission & discharge, case management, ICU care, infection control adherence	Operations Lead	Level 1-4
Indirect Patient Care Group	Laboratory Team, Surveillance Unit, Contact Tracing Team, Psychological Support, Mortuary Team	Testing & reporting, epidemiological mapping, counselling, dead body management	Surveillance Lead	Level 1-4
Technical/Scientific Group	Scientific Committee, Infection Control Committee, Training Cell,	Protocol updates, training, IPC monitoring, forecasting resource needs	Incident Commander	Level 0-4

	Logistics Committee			
Accessory/Support Group	Food Committee, Transport Team, Security, Control Room, Public Awareness Cell	Food supply, ambulance coordination, security enforcement, helpline operations	Administrative Lead	Level 1-4

Annexure IIIB: Logistics Management Matrix

Category	Items Included	Minimum Preparedness Requirement (Projected for 1,627 beds)	Monitoring Mechanism	Responsible Unit
PPE & Consumables	N95 masks, gloves, gowns, face shields	Buffer stock for 14 days at full surge (approx. 3-4 PPE sets per occupied bed/day → ~65,000-90,000 PPE sets for 14 days)	Daily stock register & weekly audit	Logistics Committee
Oxygen & Critical Equipment	Oxygen cylinders, concentrators, ventilators	Capacity to manage ≥ 30% increase over projected peak oxygen demand; ICU ventilator support for ≥ 17 surge ICU beds	Daily oxygen audit & engineering log	Biomedical / Engineering Dept
Medications	Antivirals, antibiotics, emergency drugs	Emergency reserve for 10-14 days at full occupancy (1,627 beds + 17 ICU beds)	Pharmacy inventory review (alternate day during surge)	Pharmacy Dept

Disinfection Supplies	Sanitizers, hypochlorite, cleaning materials	Continuous supply with minimum 14-day buffer stock for all pandemic wards and ICUs	IPC consumption monitoring log	Housekeeping / IPC Team
Emergency Procurement	Vendor list, emergency purchase approvals	Pre-approved vendor list; fast-track procurement activated when stock falls below 7-day reserve level	Weekly procurement log review	Finance & Procurement Dept

Annexure III C: Infrastructure Preparedness Matrix

Component	Baseline Capacity	Surge Plan (Maximum Activation)	Responsible Unit	Activation Level
Screening & Triage Area	2 triage stations (casualty + OPD entry)	Expand to 6–8 stations (separate fever/respiratory triage + high-risk triage desk)	Emergency Department	Level 1–4
Isolation Beds	40 isolation beds	Expand up to 1,627 pandemic-designated beds (Phase 1–3 cumulative activation)	Department of Medicine	Level 2–4
ICU Beds (Pandemic Surge)	2 ICU beds	Expand up to 17 ICU surge beds (including converted transit ICU)	Critical Care Unit	Level 2–4
Oxygen Supply System	PSA Plant capacity: ___ LPM (insert institutional figure)	Backup oxygen cylinders + manifold support + contingency vendor supply; ensure $\geq 30\%$ buffer above peak demand	Engineering Department	Level 2–4
Temporary Care Areas	Identified: Yes	Conversion of designated wards as	Hospital Administration	Level 3–4

		per Phase 2 & 3 surge plan		
Biomedical Waste Management	Existing biomedical waste protocol in place	Dedicated pandemic waste stream; increased pickup frequency; temporary holding area if needed	Infection Prevention & Control Team	Level 1–4

Annexure III D: Workforce Safety & Welfare Framework

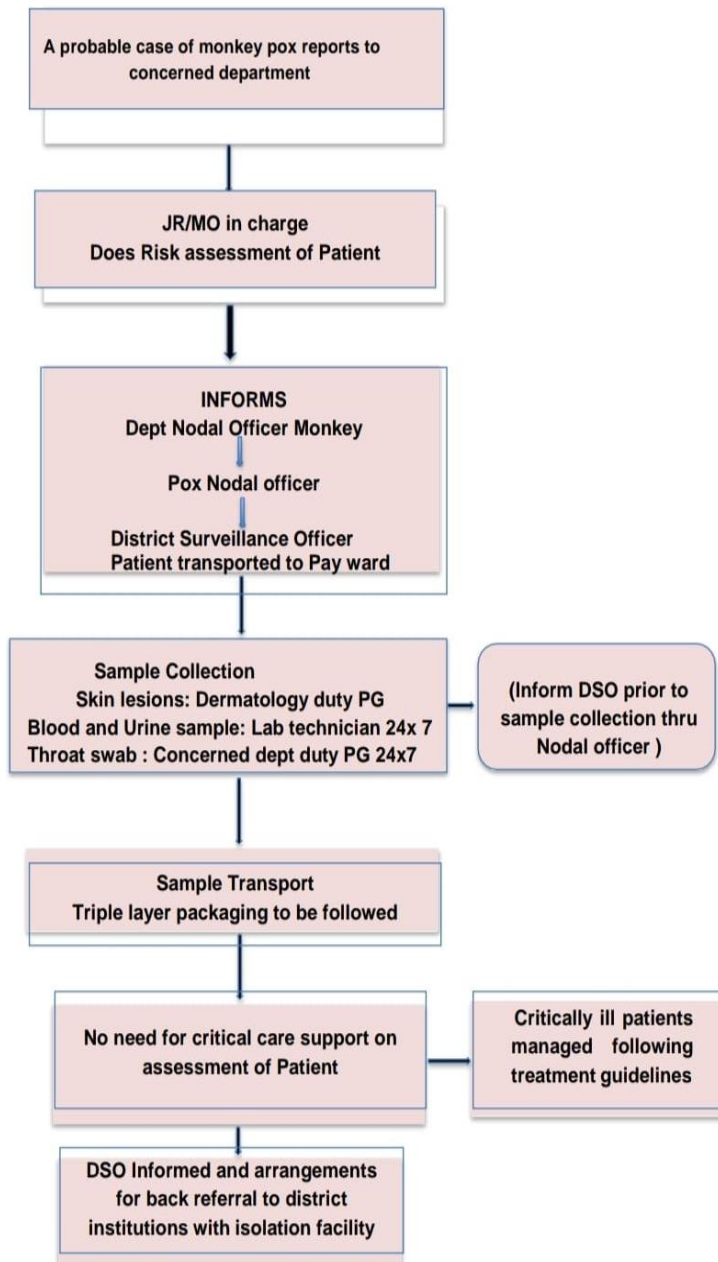
Component	Preparedness Measure	Responsible Unit	Monitoring Frequency
Duty Rotation	7–14 day rotation policy	HR Department	Weekly review
Quarantine Facility	Dedicated accommodation	Administration	As required
Mental Health Support	Counselling helpline	Psychiatry Dept	Continuous
Vaccination Coverage	Priority vaccination for staff	Occupational Health Unit	Monthly audit
Insurance & Risk Coverage	Institutional risk policy	Administration	Annual review

Annexure IV :Pandemic Surge Escalation Model

(Green – Amber – Red Framework)

Phase	Action	Capacity Activated
GREEN LEVEL – Phase 1 (Prepared Surge Mode)	Conversion of designated pay wards into pandemic care areas.	Capacity Activated: - NMCH – KHRWS Pay Ward: 65 beds - IMCH – Pay Ward: 60 beds Total Capacity: 125 beds
AMBER LEVEL – Phase 2 (Escalated Surge Mode)	Activated if ANY ONE of the following occurs: ≥ 50% of Phase 1 pandemic beds occupied OR ≥ 70% occupancy of isolation beds OR ≥ 30% increase in new daily admissions for 3 consecutive days	- NMCH – Ward 39-42, Haemato onco & Geriatric ward: 528 beds - IMCH : 100 beds Total Capacity: 628 beds
RED LEVEL – Phase 3 (Advanced / High Surge Mode)	Activated if ANY ONE of the following occurs: ≥ 60% of total pandemic beds (Phase 1 + Phase 2) occupied OR - ICU occupancy for pandemic patients ≥ 70% of surge ICU capacity OR - Oxygen utilization ≥ 60% of total institutional oxygen generation capacity	- NMCH – - Ward 1 to 4, ward 13 to 20, psychiatry ward 422 beds - IMCH – 450 beds Total Capacity: 872 beds

Annexure V : Mpox response SOP



Annexure VI : Outbreak monitoring unit (OMU) Composition

Sl.No	Position in the committee	Designation
1	Convenor	Medical Superintendent
2	Member	Deputy Medical Superintendent
3	Member	RMO
4	Member	Associate Professor Medicine
5	Member	Associate Professor Paediatrics
6	Member	HOD Community Medicine
7	Member	Associate professor-Microbiology
8	Member	RPEID cell Coordinator
9	Member	Associate professor-Pathology
10	Member	Professor Forensic Medicine
11	Member	Deputy Nursing Superintendent

Annexure VII: Nipah isolation work plan

1. Whenever a medical officer (Asst. Professor/SR) in emergency department/ ward feels that a patient needs to be shifted to Nipah isolation facility, the Asst. nodal officer should be informed.
2. It is the duty of the MO (SR/Faculty) to document the reason for shifting the patient to the isolation facility in the case sheet with date time and signature and seal in the case sheet. The bystanders also should be properly informed about the same.
3. As patient reaches the isolation facility, the nursing officer should communicate the same with the Asst nodal officer Nipah.
4. All investigations and transfer of patients must be coordinated through the nursing officer.
5. The resident on duty should promptly see the patient and update the clinical details to Asst nodal officer. All the available investigations should be entered in the case sheet and gRBS must be done. Portable X-ray and ECG are available and can be used if required for patient's management and must be informed and co-ordinated through Asst. nodal Officer Nipah.
6. Asst nodal officer should inform the clinical details to the corresponding unit chief whenever a patient gets admitted to isolation facility and the patient management is done through the admitting unit and should be coordinated by Asst Nodal Officer.
7. HOD Medicine should be periodically updated about the patients admitted to the isolation facility as appropriate depending on the condition of the patient and other administrative matters by the Asst. Nodal Officer.
8. Asst. nodal officer oversees the coordination of all the samples sent and must coordinate with the departments of Microbiology, Biochemistry, and Pathology through the department nodal officer.
9. The Nodal Officer, Department of Community Medicine should be responsible for evaluating the epidemiological link of suspects/confirmed admitted in the isolation facility of Nipah and should coordinate the same through Asst Nodal Officer (Nipah).

10. Duty list of junior doctors, nursing officers and lab technicians posted with phone no should be handed over to the nursing officer and should be made available for quick reference.
11. If a patient is admitted as “suspect Nipah”, the radiological investigations requiring shifting the patient to Radiology department should be done only after co-ordinating with HOD Radiodiagnosis/Nodal Officer Radiodiagnosis.
12. Dead body management should be as per protocol and after proper information as per the case.
13. Assistant Nodal officer should inform all the relevant details to the chief nodal officer whenever needed.
14. The data management should be through a single facility and data should be shared through the Chief Nodal Officer.

Annexure VIII

Guidelines for dialysis units during pandemics

[PROTOTYPE COVID 19]

Chronic kidney disease (CKD) patients on dialysis such as maintenance hemodialysis (MHD) or continuous ambulatory peritoneal dialysis (CAPD) are vulnerable to get COVID-19 infection because of their existing co-morbidities, repeated and unavoidable exposure to hospital environment and immunosuppressed condition. IPC measures to be followed include:

- All standard precautions must be strictly followed.
- All staff must be trained in cough etiquette, hand hygiene and proper use and disposal of PPE.
- All patients who are routinely coming for hemodialysis must be tested for COVID once in 10 days and a register should be maintained. Rapid antigen test may be used for this purpose
- Ensure that the rapid antigen test for COVID is also done along with other viral markers for cases requiring emergency HD.
- All patients undergoing HD must wear a triple layer mask and face shield. Either patients can use their on-face shield or decontaminated permanent shield provided from the department. Also ensure that they are wearing these properly during dialysis.
- Hand sanitizer must be placed in all dialysis cots, should strictly follow hand hygiene before handling any patient and in between two patients.
- Symptomatic health care workers must be tested and refrain from duty till the test report is obtained.
- Thorough cleaning of surfaces and floor must be done with 1% hypochlorite solution. High touch surfaces like bedside tables and lockers, dialysis machines, doorknobs, light switches, counter tops, handles, phones, keyboards, toilets sinks etc. must be cleaned two hourly.

- Separate stethoscopes, thermometers, Oxygen saturation probes and blood pressure cuffs between patients with appropriate cleaning and disinfection should be done in between shifts.
- Dialysis tubings used for COVID positive patient must be disposed according to BMW management rule.
- Dialysis staff should use all personal protective equipment (PPE) for proven or strongly suspected patients of COVID-19. Suspected or positive COVID-19 patients should properly wear disposable three-layer surgical mask throughout dialysis duration. Patients should follow cough etiquettes, hand hygiene etc.

Annexure IX

Protocol for handling of deceased during pandemics [prototype-COVID 19]

The main driver of transmission of COVID-19 is through droplets. There is unlikely to be an increased risk of COVID infection from a dead body to health workers or family members who follow standard precautions while handling body. But in case of diseases like Ebola, Marburg, CCHF etc HCW can get infections from the deceased as well. Only the lungs of dead COVID patients, if handled during an autopsy, can be infectious. Standard Precautions to be followed by health care workers while handling dead bodies of COVID. Standard infection prevention control practices should be followed at all times.

These include:

1. Hand hygiene.
2. Use of personal protective equipment (e.g., water resistant apron, gloves, masks, eyewear).
3. Safe handling of sharps.
4. Disinfect bag housing dead body; instruments and devices used on the patient.
5. Disinfect linen. Clean and disinfect environmental surfaces.

Training in infection and prevention control practices

All staff identified to handle dead bodies in the isolation area, mortuary, ambulance and those workers in the crematorium / burial ground should be trained in the infection prevention control practices.

Removal of the body from the isolation room or area

- The health worker attending to the dead body should perform hand hygiene, ensure proper use of PPE (gloves, N95 mask, goggles, water resistant apron).
- All tubes, drains and catheters on the dead body should be removed.
- Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) should be disinfected with 1% hypochlorite and dressed with

impermeable material.

- Apply caution while handling sharps such as intravenous catheters and other sharp devices. They should be disposed into a sharps container.
 - Plug oral, nasal orifices of the dead body to prevent leakage of body fluids.
 - If the family of the patient wishes to view the body at the time of removal from the isolation room or area, they may be allowed to do so with the application of Standard Precautions.
 - Place the dead body in leak-proof plastic body bag. The exterior of the body bag can be decontaminated with 1% hypochlorite solution. The body bag can be wrapped with a mortuary sheet or sheet provided by the family members.
 - The body will be either handed over to the relatives or taken to mortuary.
 - All used/ soiled linen should be handled with standard precautions, put in biohazard bag and the outer surface of the bag disinfected with hypochlorite solution.
 - Used equipment should be autoclaved or decontaminated with disinfectant solutions in accordance with established infection prevention control practices.
 - All medical waste must be handled and disposed of in accordance with Biomedical waste management rules.
 - The health staff who handled the body will remove personal protective equipment and will perform hand hygiene.
 - Provide counselling to the family members and respect their sentiments.
- Environmental cleaning and disinfection All surfaces of the isolation area (floors, bed, railings, side tables, IV stand, etc.) should be wiped with 1% Sodium hypochlorite solution; allow a contact time of 30 minutes and then allowed to air dry.
- Handling of dead body in Mortuary
- Mortuary staff handling COVID-19 dead body should observe standard precautions.
 - Dead bodies should be stored in cold chambers maintained at approximately 4°C.

- The mortuary must be kept clean. Environmental surfaces, instruments and transport trolleys should be properly disinfected with 1% Hypochlorite solution.
- After removing the body, the chamber door, handles and floor should be cleaned with sodium hypochlorite 1% solution.

Transportation

- The body, secured in a body bag, exterior of which is decontaminated poses no additional risk to the staff transporting the dead body.
- The personnel handling the body may follow standard precautions (surgical mask, gloves).
- The vehicle, after the transfer of the body to cremation/ burial staff, will be decontaminated with 1% Sodium hypochlorite.

Annexure X

General instructions regarding admissions and discharge of COVID -19 Patients

- 1. The Security staff must enter in the register provided regarding the patient details including bystander details, present address, and vehicle no and the time of entry to the COVID-19 OP. If taking admission, enter the admission details else out time.
- 2. Category C patients are supposed to be admitted. Category A and B patients who are admitted in pay wards should sign the consent that after getting relieved from symptoms they should cooperate with treating doctors regarding shifting to wards or CFLTCs.
- 3. Patients should be shifted to concerned ward or pay ward as early as possible.
- 4. Inform COVID-19 nodal officer in charge and SPEID cell if COVID 19 positive GMCH, Trivandrum HCW /student get admitted.
- 5. Admitted patients should be accompanied by staff and make sure that the patient reached the concerned area safely
- 6. It should be mandatory to keep an ID band for the admitted COVID -19 patients
- 7. Security staff should be alert when the patients come out of OPD.
- 8. If both mother and child is admitted in MCH, inform SAT Superintendent and retain baby here and take admission for SAT
- 9. Before allotting bed /room to the patient make sure about the cleanliness of room, working condition of fan, light etc.
- 10. All HCWs should treat the patient with courtesy even if the patient is provoking. Inform higher officials in case of any incident.
- 11. There should not be any delay in food for the patients.
- 12. If there is any unusual incidence happening in ward/ payward it should be informed to concerned authorities and document in incident report register.
- 13. RAT negative patients can be shifted in ambulance for home isolation. The name of ambulance driver and his contact number should be noted to avoid any issues to the patient.
- 14. The relatives should be informed regarding the discharge, and they should be shifted without any delay.

- 15. Discharges at night should be avoided especially for female patients.
- 16. The patient should be shifted to ward/ICU or other hospital only after ensuring the bed is readily available.
- 17. Post COVID -19 Symptomatic patients can be tested for RTPCR if they have ILI otherwise RAT is preferred. 18. Vacant bed (discharge/death) should be informed to Extn No: 8145 as early as possible.

Annexure XI

Instructions for safe use of linen

Packing and transporting linen and laundry from isolation areas

- Place soiled linen directly into containers or bags in the isolation room or area.
- Contain the soiled linen in a manner that prevents the containers or bags from opening or bursting during transport.
- One layer of packing is adequate, provided that the soiled linen can be placed in the bag without contaminating the outside of the bag. Double-bagging is unnecessary.
- Ensure that all persons who handling the soiled linen must use Standard Precautions, and perform hand hygiene after removing PPE.
- Heavy-duty tasks (e.g. cleaning of the environment) require more resistant PPE (e.g. rubber gloves and apron, and resistant closed shoes). Best practices for linen (and laundry) handling
- Always wear reusable rubber gloves prior to handling soiled linen (e.g., bed sheets, towels, curtains).
- Never carry soiled linen against the body. Always place it in the designated container.
- Carefully roll up soiled linen to prevent contamination of the air, surfaces, and cleaning staff. Do not shake it.
- If there is any solid excrement on the linen, such as feces or vomit, scrape it off carefully with a flat, firm object and put it in the commode or designated toilet/latrine before putting linen in the designated container
- Place soiled linen into a clearly labelled, leak-proof container (e.g., bag, bucket) in the patient care area. Do not transport soiled linen by hand outside the specific patient care area from where it was removed.
- Reprocess (i.e., clean and disinfect) the designated container for soiled linen should be reprocessed after each use
- If reusable linen bags are used inside the designated container, do not overfill them,

tie them securely, and launder after each use Always use and maintain laundry equipment according to manufacturer's instructions. Always launder soiled linens from patient care areas in a designated area, which should:

- Be a dedicated space for performing laundering of soiled linen
- Have floors and walls made of durable materials that can withstand the exposures of the area (e.g., large quantities of water and steam)
- Have a separation between the soiled linen and clean linen storage areas, and ideally should be at negative pressure relative to other areas
- Have hand washing facilities
- Have Structured Operating Protocols (SOP) and other job aids to assist laundry staff with procedures

Annexure XII

Patient care equipment sop for emerging pathogens

- Dedicated instruments must be used for suspected patients and confirmed cases.
- Staff on duty must check the availability of the equipment in each shift.
- Proper cleaning and disinfection is necessary.
- Thermometer, stethoscope, glucometer, BP apparatus, Pulse oximeter etc. to be the dedicated patient care equipment
- The HCW must wear PPE properly while reprocessing instruments.
- Disposable items must never be reused.
- Heat stable items after decontamination using 1% bleach solution for 10min, clean with water & detergent and sterilize by autoclaving. Heat sensitive items can be sterilized by ETO sterilizer or Sterrad.
- All medical/surgical/dental devices must be sterilized according to manufacturer's instructions.

Annexure XIII

Biomedical Waste Management [BMW] Protocols in Isolation wards

- Healthcare Facilities having isolation wards need to follow these steps to ensure safe handling and disposal of biomedical waste generated during treatment;
- Keep separate bins/bags/containers (yellow colour) in isolation wards and maintain proper segregation of waste as per BMWM Rules, 2016 as amended and Central Pollution Control Board (CPCB) guidelines for implementation of BMW Management Rules.
- As precaution double layered bags (using 2 bags) should be used for collection of waste from isolation wards so as to ensure adequate strength and prevent leaks;
- Collect and store biomedical waste separately prior to handing over the same to Common Biomedical Waste Treatment and Disposal facility (CBWTF).
- Use a dedicated collection bin labelled as “X” to store infectious waste and keep separately in temporary storage room prior to handing over to CBWTF. Biomedical waste collected in such isolation wards can also be lifted directly from ward into CBWTF collection van.
- In addition to mandatory labelling, bags/ containers used for collecting biomedical waste from isolation wards, should be labelled as “X Waste”. This marking would enable CBWTF is to identify the waste easily for priority treatment and disposal immediately upon the receipt.
- Mixing of X waste with the biomedical waste from other wards, general waste etc. should be avoided.
- General waste other than biomedical waste should be disposed as per Solid Waste Management (SWM) Rules, 2016 only after proper disinfection.
- Maintain separate record of waste generated from X isolation wards. - Use dedicated trolleys and collection bins in isolation wards. A label “X Waste” to be pasted on these items also.
- The (inner and outer) surface of containers/bins/trolleys used for storage of COVID-19 waste should be disinfected with 1% sodium hypochlorite solution.

Annexure XIV

sop for air conditioning and ventilation - engineering aspects in isolation rooms to prevent airborne disease transmission

Hospitals usually have sub-optimal facilities to provide airborne infection isolation for large numbers of patients with airborne infectious diseases presenting in a short time period. Heating, ventilation, and air conditioning (HVAC) expertise is essential for proper environmental management when planning control of airborne infectious disease outbreaks

Engineering controls

- These are physical or mechanical measures used to reduce the risk for transmission of airborne infectious diseases. It includes ventilation, filtration, ultraviolet germicidal irradiation, AIIRs, local exhaust ventilation devices etc.
- The time required for removing a given percentage of airborne particles from a room or space depends on the number of air changes per hour (ACH).
- Filtration reduces the risk for transmitting airborne infectious agents. Filters for clinical spaces should be able to remove at least 90% of particles (0.5 microns in size and larger)
- Poorly designed or maintained ventilation systems can increase the risk of health-care- associated infections transmitted by airborne pathogens due to incorrect airflow and poor maintenance of the system. A higher ventilation rate can provide a higher dilution capability and consequently potentially reduce the risk of airborne infections. Mechanically ventilated areas In health-care facilities where a mechanical ventilation system is available, negative pressure should be created to control the direction of airflow. The ventilation rate should be 6-12 ACH, ideally 12 ACH for new constructions, with a recommended negative pressure differential of $\geq 2.5\text{Pa}$
- For patient care areas in hospital without adequate natural or mechanical ventilation-Installation of exhaust fans will be helpful.

Installation of high-efficiency particulate air (HEPA) filters: HEPA filters (either ceiling mounted or portable) can be effective in reducing/lowering concentrations of infectious aerosols in a single space. Health-care facilities that choose to use HEPA filters should follow the manufacturer's instructions, including on recommended cleaning and maintenance procedures for HEPA filters

- Respiratory infections like COVID-19 positive patients and patients with COVID-19 related symptoms are to be accommodated in designated "Airborne Infection Isolation Rooms (AIIR)" in hospitals to control spread of the disease. However due to the surge in the number of such patients, healthcare facilities may not have adequate number of "AIIR" rooms to accommodate all such patients. Hence, healthcare facilities would need to convert their existing patient rooms or ICUs into COVID-19 patient rooms or COVID-19 ICUs to avoid risk to other patients as well as HCWs.
- AIIRs are single-patient rooms at negative pressure relative to the surrounding areas, and with a minimum of 6 air changes per hour (12 air changes per hour are recommended for new construction or renovation). Air from these rooms should be exhausted directly to the outside or be filtered through a high-efficiency particulate air (HEPA) filter directly before recirculation.
- To convert an existing patient room or ICU into a COVID-19 patient area, it is first necessary to convert the room into a non-recirculatory system (100% once through system) ie, the room should be negatively pressurized in relation to the corridor. On an emergency basis, this can be achieved by blanking (blocking) off the return air vents in the COVID-19 patient room. An independent exhaust blower shall be provided to extract the room air and exhaust out into the atmosphere
- The recommended air exchange rate for AIIRs is 12 air changes per hour (ACH). The position of the extract air in the room shall be just above the head of the patient's bed. The exhaust air is most likely to contain particles carrying a viral load and hence a suitable technique should be deployed to prevent the spread of infections. Treatment of exhaust air can be done preferably by HEPA filtration. In diagnostic dept. ventilation rate required is 10 air change /hour. In operation room

temperature of 23 to 25°C, 50% humidity and 15-20 air change per hour is required.

Heating, ventilation and air-conditioning (HVAC) has a pivotal role in determining infection rates in the intensive care unit (ICU). Essential functions of HVAC system include heating (adding heat to raise or maintain temperature), cooling (removing heat to lower or maintain temperature), humidifying (adding water vapour), dehumidifying (removing water vapour) in order to maintain the moisture content of the air, filtering (removing dust particles, biological contaminants like bacteria, viruses and fungi), ventilating (air change rates between outdoor) and air distribution (velocity, flow pattern, direction of movement and distribution patterns). These functions result in air conditioning, which aid in the prevention of contamination and cross-contamination and environmental protection along with operator protection. Airborne diseases have been linked to poorly functioning HVAC system: improper function of temperature control, humidity control, air distribution and filtration of HVAC systems.

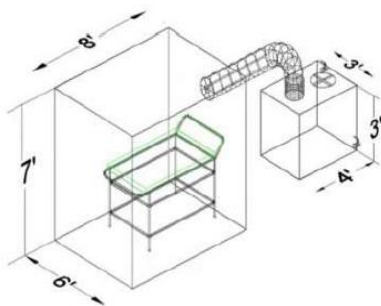
Temporary Negative Pressure Isolation (TNPI) TNPI is considered when airborne infection isolation is needed and there is insufficient AIIRs when an outbreak of an airborne infectious disease with large numbers of communicable patients seeks admission. So temporary isolation is designed to protect patients and staff from contracting or transmitting highly infectious diseases. HEPA filter is used to exhaust room air outside through the window. HEPA machine in this application is to clean contaminated air and induce negative pressure in the room. To prevent pulling air from return air system, the exhaust/return grilles should be sealed with tape.

Annexure XV

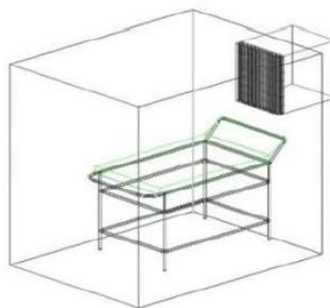
Setting Up Make-Shift Isolation Enclosures

In crisis care scenario in healthcare settings, several COVID-19 patients may be required to be admitted to a single large room. This presents a significant risk to the health care workers as well as a possibility for environmental spread of virus laden particles. For such instances, a make-shift patient isolation enclosure could provide the necessary protection. This could be a temporary makeshift cubicle or tent constructed out of a skeleton structure (of plastic or metal) and plastic sheet or canvas covering. The tent shall be covered on all sides excepting the front, where PVC strip curtains can be provided. Arrangements for light and a fan inside the tent can be provided for the comfort of the patient, as necessary. The tent shall be provided with an exhaust blower to extract the air inside the enclosure and exhaust out into the atmosphere after suitable treatment.

In case of air-conditioned patient rooms where exhaust blowers cannot be fixed, the Isolation enclosure can be installed inside the patient room with HEPA filtered exhaust air. The exhaust air, after HEPA filtration can be discharged inside the room. This provides a localized negative pressure zone inside the room and helps control infection spread and offers protection to the healthcare workers.



Isolation enclosure with Chemical
for exhaust air disinfection.



Isolation enclosure
with HEPA filtration for exhaust air

How to convert an operation theatre to handle patients with emerging infections like in covid OT

- Airborne infection isolation requirements (AIIR) must be strictly enforced
- The most important factor in COVID -19 pandemic is to ensure that the virus laden airborne particles do not leak out of the rooms occupied by COVID-19 patients to control the spread of infections and also to protect the healthcare workers
- In normal practice, most of the OTs would be served by a Heating, Ventilating, Air Conditioning (HVAC) system that would be of a re circulatory type, wherein the air from the OT is taken back to the air handling unit (AHU) for thermal conditioning and brought back
- If a COVID-19 patient has to be operated in such an OT, it will present a significant risk of the virus laden particles spreading out from the designated COVID OT
- If operation theatres are not negatively pressurized, the positive pressure system and central air conditioning must be turned off.
- To convert an existing OT into a COVID OT, it is first necessary to convert the OT into a non-re circulatory system (100% once through system)
- On an emergency basis, this can be achieved by blanking (blocking) off the return air vents in the OT. Additionally, an independent exhaust blower shall be provided to extract the room air and exhaust out into the atmosphere, preferably, after suitable “exhaust air treatment”
- The exhaust air quantity should be greater than the supply air quantity so that a negative pressure of minimum 2.5 Pa (preferably >5 Pa) is achieved in the room. The supply air quantity should provide a minimum of 12 air changes per hour. The position of the extract air duct in the OT should be just above the head of the patient
- As a next best possible option, the COVID OT can have standalone room air-conditioners. Room air conditioners re-circulate air within a single occupied zone. Two split air-conditioners of 2 tons refrigeration capacity per OT are usually required. Recirculation of cool air by room air conditioners, must be accompanied

by outdoor air intake through slightly open windows and exhaust by natural exfiltration.

- Set the room temperature between 24°C and 30°C. Maintain relative humidity between 40% and 70%. ☐ Negative pressure could be created by putting up 2-3 exhaust fans which will drive air out of the room. However, exhaust fans can lead to significant noise pollution and some compromise in OT sterility
- Treatment of exhaust air can be done preferably by high efficiency particulate air (HEPA) filtration. ☐ Suitable renovation/modification should be carried out in this regard so that there is no mixing up of the air between COVID and non-COVID operation theatres

Index of Annexures

All the major institutions shall keep the following Annexures with all details ready at their respective institution level. The SoPs shall be updated / modified as per the research and information available regarding the respective pathogens..

1. Triage and Red channel protocol
2. Patient transport protocol during pandemics
3. SOP for Patient care equipment
4. SOP Hand hygiene
5. SOP Cough etiquette
6. Personal safety measures and PPE use
7. SOP for environmental cleaning
8. Environmental and Engineering controls
9. SOP for Makeshift Isolation enclosures
10. SOP for pandemic operation theatre
11. Guidelines for Dialysis units
12. Protocol for handling of deceased
13. Guideline on dead body management in context of COVID 19
14. SOP for Safe Linen Use
15. Biomedical Waste Management [BMW] Protocols in Isolation wards:
16. Medical Board Constitution
17. SOP for transporting a Suspect/ Confirmed case
18. CPCB Guidelines – Biomedical Waste Management
19. Mapping of laboratories
20. Infection Prevention and Control Manual-GMCH

Contact Details

Name of college	Contact Points	Contact Number
GMC Trivandrum	Information counter	4712528225
	General enquiry	4712528083
	Duty PRO	8281529159
GMC Kollam	Control Room	4742575050
GMC Konni	Control Room	4682344888
GMC Alappuzha	Control Room	4772281000
	Duty PRO	8281002947
GMC Kottayam	Control Room	9188528533
GMC Idukki	Casualty	04862232444
	Control Room	4862232555
GMC Ernakulam	Control Room	04842754000 04842751001 8075774769
	Duty PRO-	9778082825
GMC Thrissur	Control Room	04872472002 8075011853
	Duty PRO-	9383400082
GMC Manjeri	Control Room	8078253515
GMC Kozhikode	Control Room	4952350349
	Duty PRO-	9497669040
	IMCH Control room	4952350395
GMC Wayanad	Duty PRO-	8129428785
GMC Kannur	Control Room	04972882200, 8078041358
	General enquiry-	4972882100
	Duty PRO-	04972882390 9048600970
GMC Kasaragod	Control Room	8289908320