

# NOVELTY

1. Tracking of movements of MDR patients across wards and the usage of equipments by them through ***QR Code based approach*** recording timestamp details as well.

The screenshot shows a mobile application interface titled "Add New Patient". At the top, there is a back arrow icon and the title "Add New Patient". Below the title, there is a section labeled "Patient Details" with a person icon. It contains fields for "Patient ID" (with placeholder "Enter Patient ID" and a QR code icon), "Name" (placeholder "Enter full name"), "Age" (placeholder "Enter age"), and "Ward / Location" (placeholder "ICU / Ward B / etc." with a delete icon). Below this, there is a section labeled "MDR Information" with a shield icon. It contains a toggle switch labeled "Is this a known MDR case?" which is turned off. At the bottom right of the screen is a blue "Save Patient" button.

2. The Data and the ML model for predicting the level of MDR Risk are validated based on ***ICMR Guidelines***.

The screenshot shows a desktop application window titled "mdr\_screening\_app" with a "Patient Overview" header. At the top left is a back arrow icon. Below the header, there is a search bar with placeholder "Patient ID" containing "P001" and a "Load Overview" button. Underneath the search bar is a section titled "MDR Risk Summary" featuring a yellow circle with an orange "M" and the text "MEDIUM • 44.0%". The main content area is titled "Movements (7)". It lists seven movement entries: 1. "ICU" movement from 2025-12-09 15:30:33.496831 to 2025-12-09 16:30:33.496831; 2. "Ward B" movement from 2025-12-09 16:30:33.496831 to 2025-12-09 17:00:33.496831; 3. "ICU" movement from 2025-12-09 15:32:08.100727 to 2025-12-09 16:32:08.100727; and 4, 5, 6, 7, which are partially visible below the third entry.

- If the person is MDR positive, identifying the ***type of the disease associated and the possible pathogen*** that is causing the risk. Also, identifying the transmission medium of the pathogen that helps for the better level of isolation and prevent outbreak.

**MDR Information**

Is this a known MDR case?

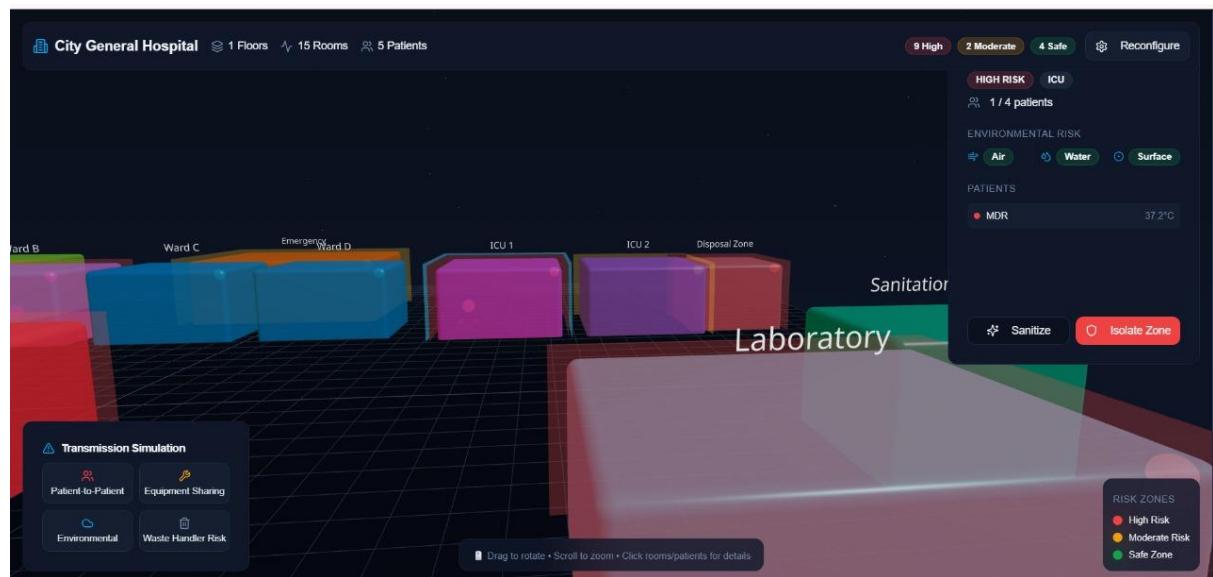
Pathogen: Influenza A/B

Syndrome: ARI

Transmission: Respiratory droplets, aerosols and contact.

**Save Patient**

- Brings awareness among people about the level of MDR risk in the hospital using **Digital Twin** of hospital(dashboard-display) on large screens and allows them to take precautionary measures accordingly.



5. Real-Time video surveillance **using Open CV to trace contact** of MDR patients with other patients in hospital that are missed by QR code scanning.



# EXPECTED OUTCOMES

## Expected Solution:

Students may propose a hospital IT system add-on, dashboard, or mobile/web application that integrates with existing hospital data and enables real-time alerts.

A hospital infection-control system that:

1. Tracks patient movement/contacts inside hospitals.
2. Flags MDR exposure chains in real-time.
3. Integrates with hospital EHR and lab systems.
4. Generates automated alerts for infection control teams.

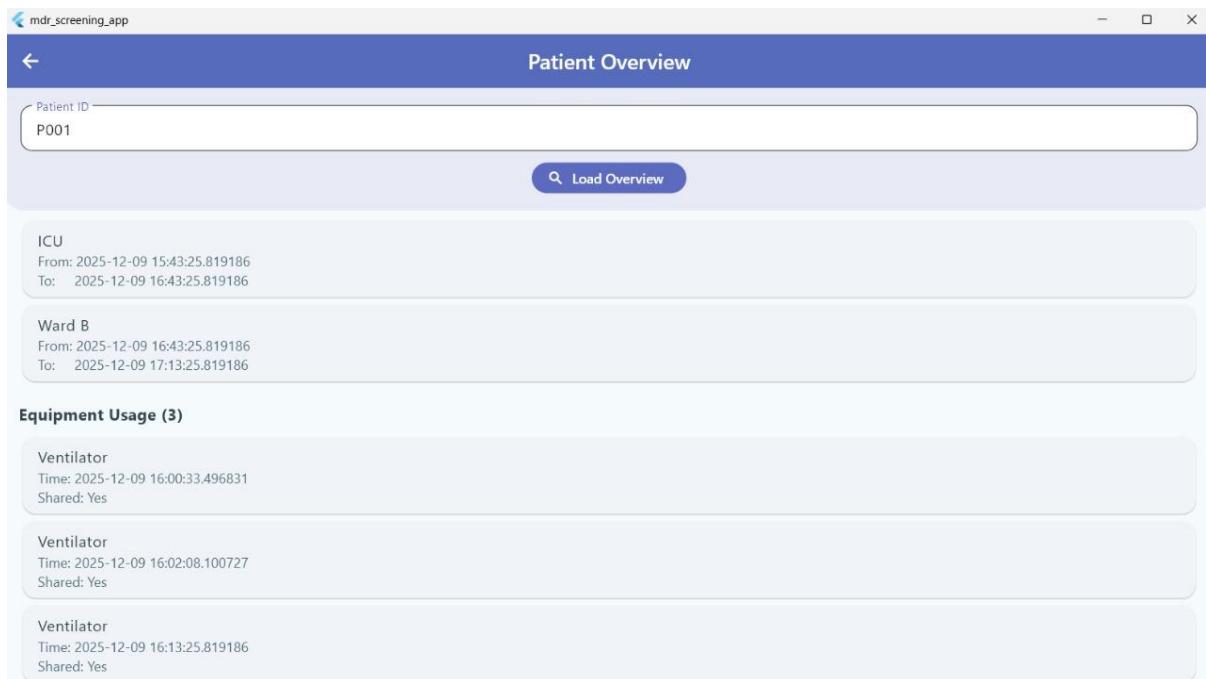
## Our Solution:

1. Movement/Contact:

The screenshot shows a Windows application window titled "mdr\_screening\_app". The main title bar says "Patient Overview". Below the title bar, there is a search bar labeled "Patient ID" containing "P001" and a "Load Overview" button. The main content area displays patient movement history in two sections: "ICU" and "Ward B". Under "ICU", it shows a trip from 2025-12-09 15:43:25.819186 to 2025-12-09 16:43:25.819186. Under "Ward B", it shows a trip from 2025-12-09 16:43:25.819186 to 2025-12-09 17:13:25.819186. At the bottom, there is a section titled "Equipment Usage (3)" which lists three ventilator usage entries, each with a timestamp, a "Time" field, and a "Shared: Yes" checkbox.

Equipment Usage	Time	Shared
Ventilator	2025-12-09 16:00:33.496831	Yes
Ventilator	2025-12-09 16:02:08.100727	Yes
Ventilator	2025-12-09 16:13:25.819186	Yes

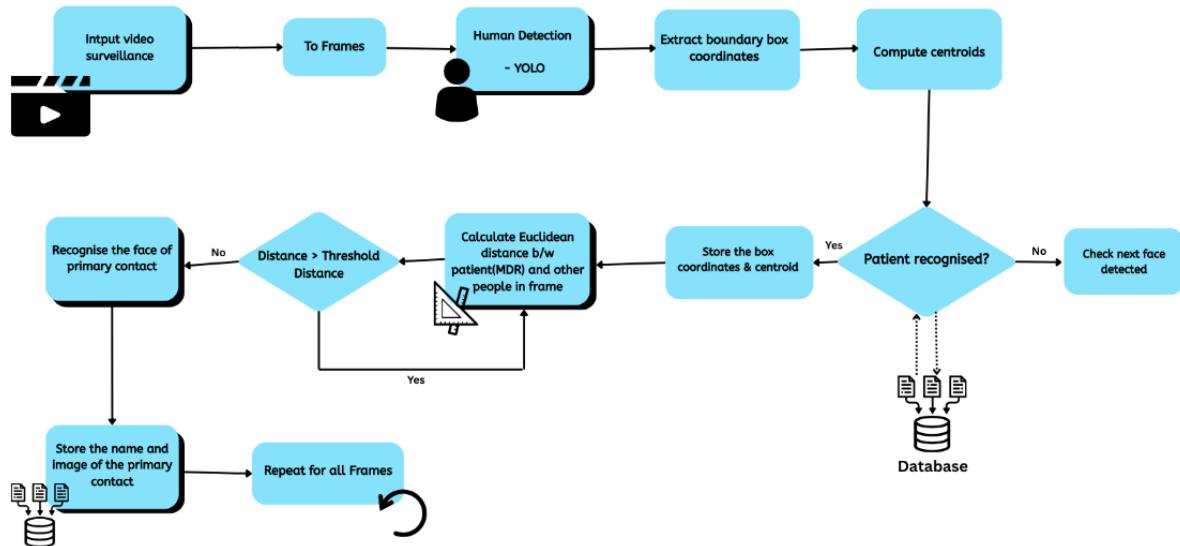
- Movement : Through GUI – QR Code based movement tracking across different wards, usage of different equipments with timestamps.



- Contact: Contact based tracing is done using real time video Surveillance using Computer Vision

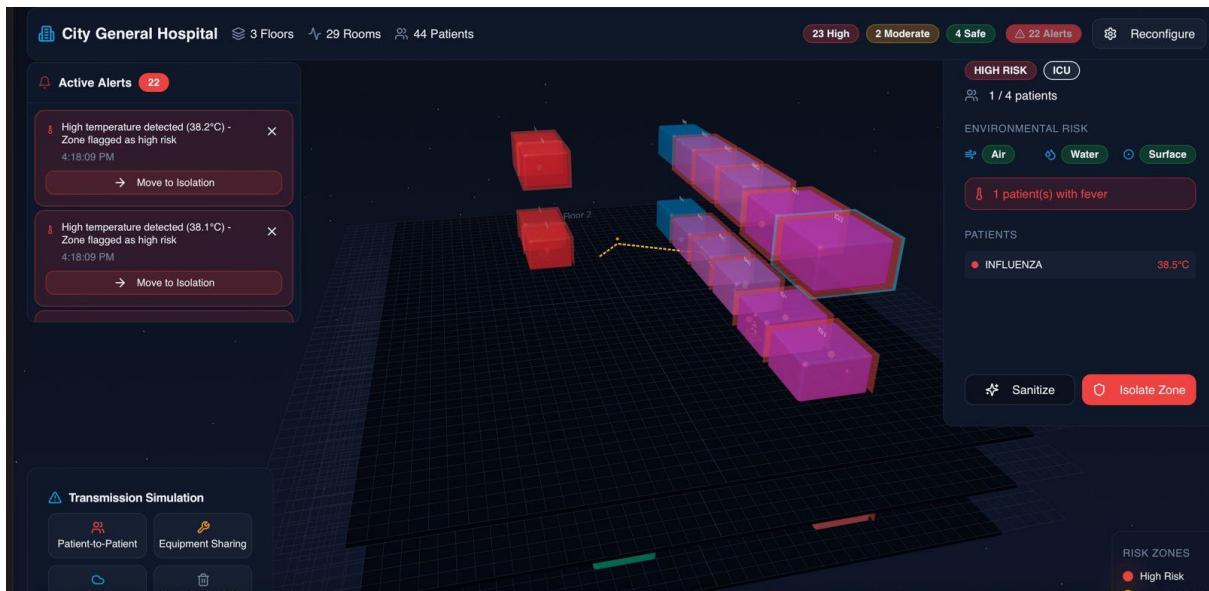


## CONTACT TRACING OF MDR PATIENTS IN HOSPITALS



### 2. Flags MDR exposure:

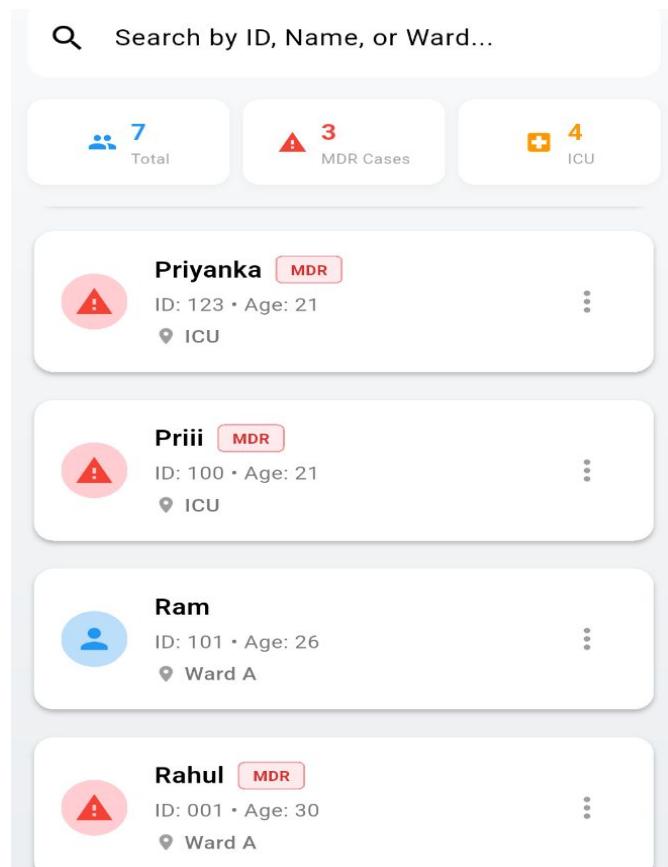
- Individual MDR risk : diagnostic report as inputs to ML model that predicts the Risk basically categorised into level of exposure (high, medium, low risks) based on ICMR guidelines.



- Level of MDR exposure inside a hospital is done through Digital Twin using different colour codes.

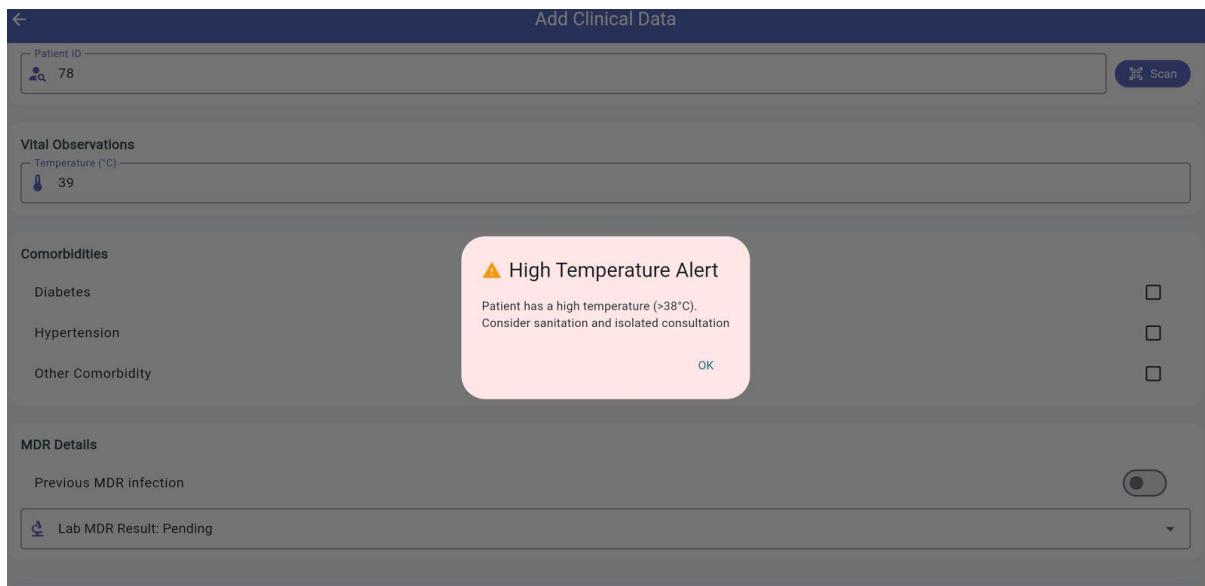
3. Integrates with Hospital EHR and Lab Systems :

- Frontend GUI to accept the input of diagnostic reports and storing it in the database that has aligned with the hospital EHR system further analysis and actions.

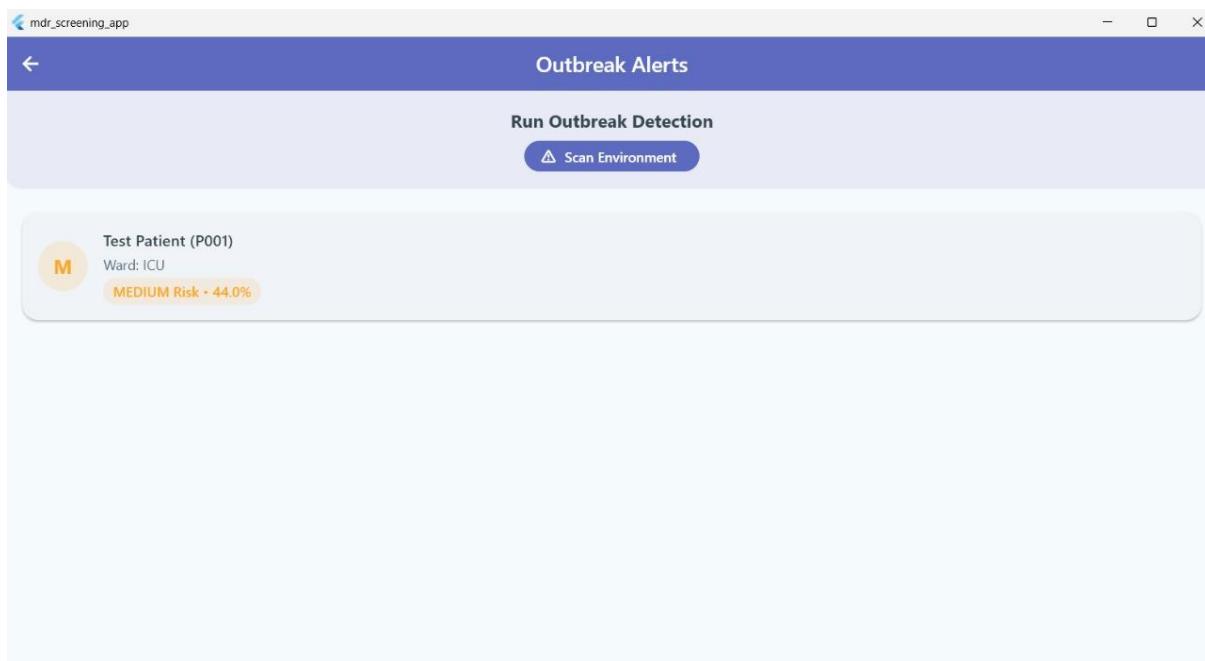


#### 4.Generates Automated Alerts for Infection:

- Initial Thermal Screening Alert on patient entry with sanitizing for **isolated consultation** (Pre-Dagnosis/**helps to prevent outbreaks**).



- Patient Level of Risk through AI Model – High level, Medium, Low Level risks



- Alert the Infection Control Team at hospital through digital twin dashboard display across corridors of hospital, and also alerts everyone present in the hospital so that they can take precautions and prevent further spread of infection.

