

Source: Editors

Title: DEL9.1 & DEL9.2 progress review

Purpose: Discussion

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Abstract: This presentation contains an update on DEL9.1 & DEL9.2 activities (Mobile applications, Cloud-based AI applications) for presentation and discussion during the e-meeting, 30 September – 2 October 2020.



Connecting People, Saving Lives



AI4H Mobile applications & Cloud-based AI applications

Khondaker A. Mamun

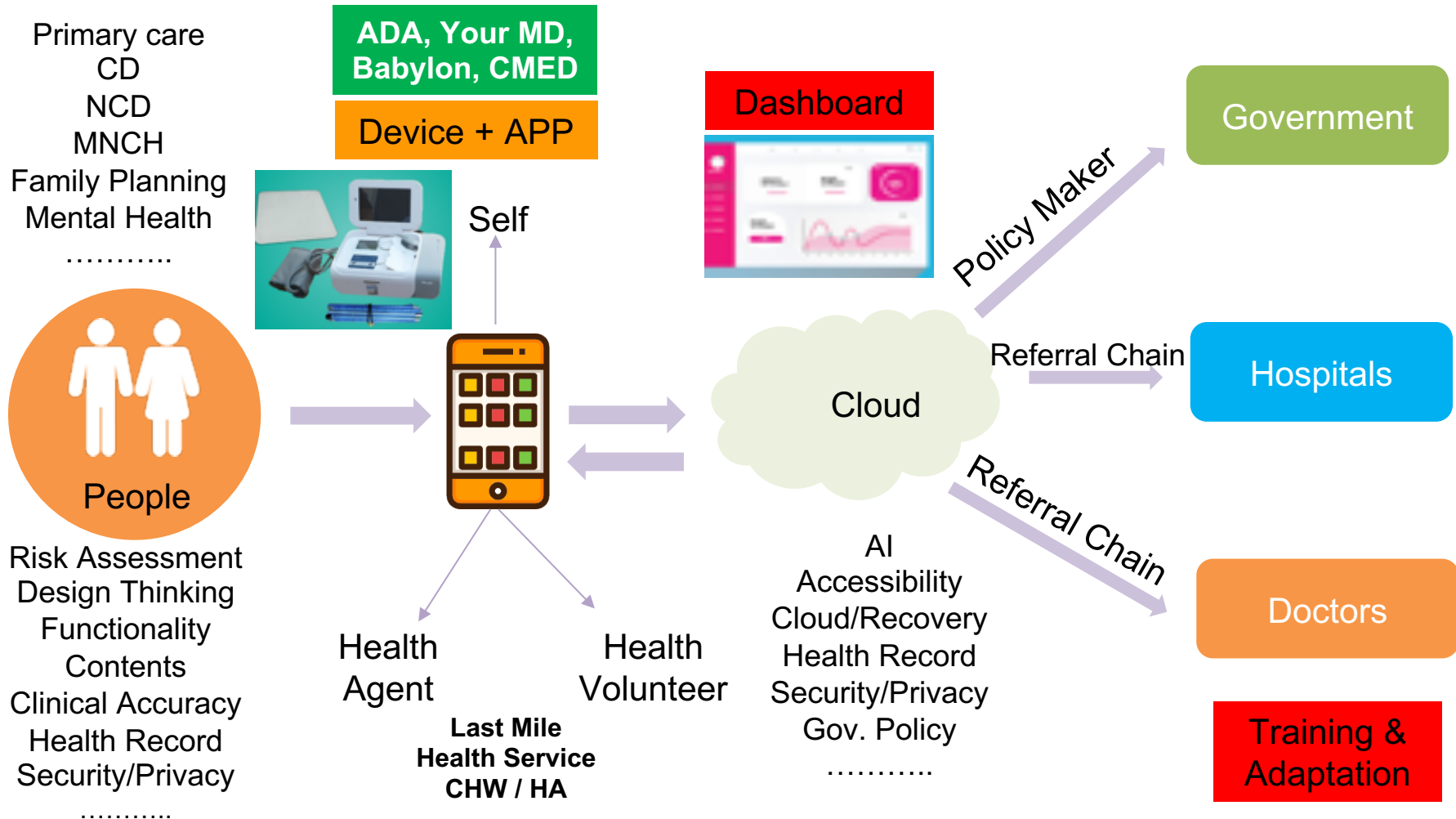
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Founder and Director, Advanced Intelligent Multidisciplinary Systems Lab (AIMS Lab)

Professor, Dept. of CSE, United International University, Dhaka, Bangladesh

AI4H Mobile applications & Cloud-based AI applications



Digital Health Inclusion to achieve UHC



AI Based COVID-19 Digital Surveillance Platform



AI based National COVID-19 Digital Surveillance Platform for Bangladesh to identify high risk patients, areas, and evaluate community transmission through collecting COVID-19 screening and contact tracing data at community level.



AI Based COVID-19 Digital Surveillance Platform

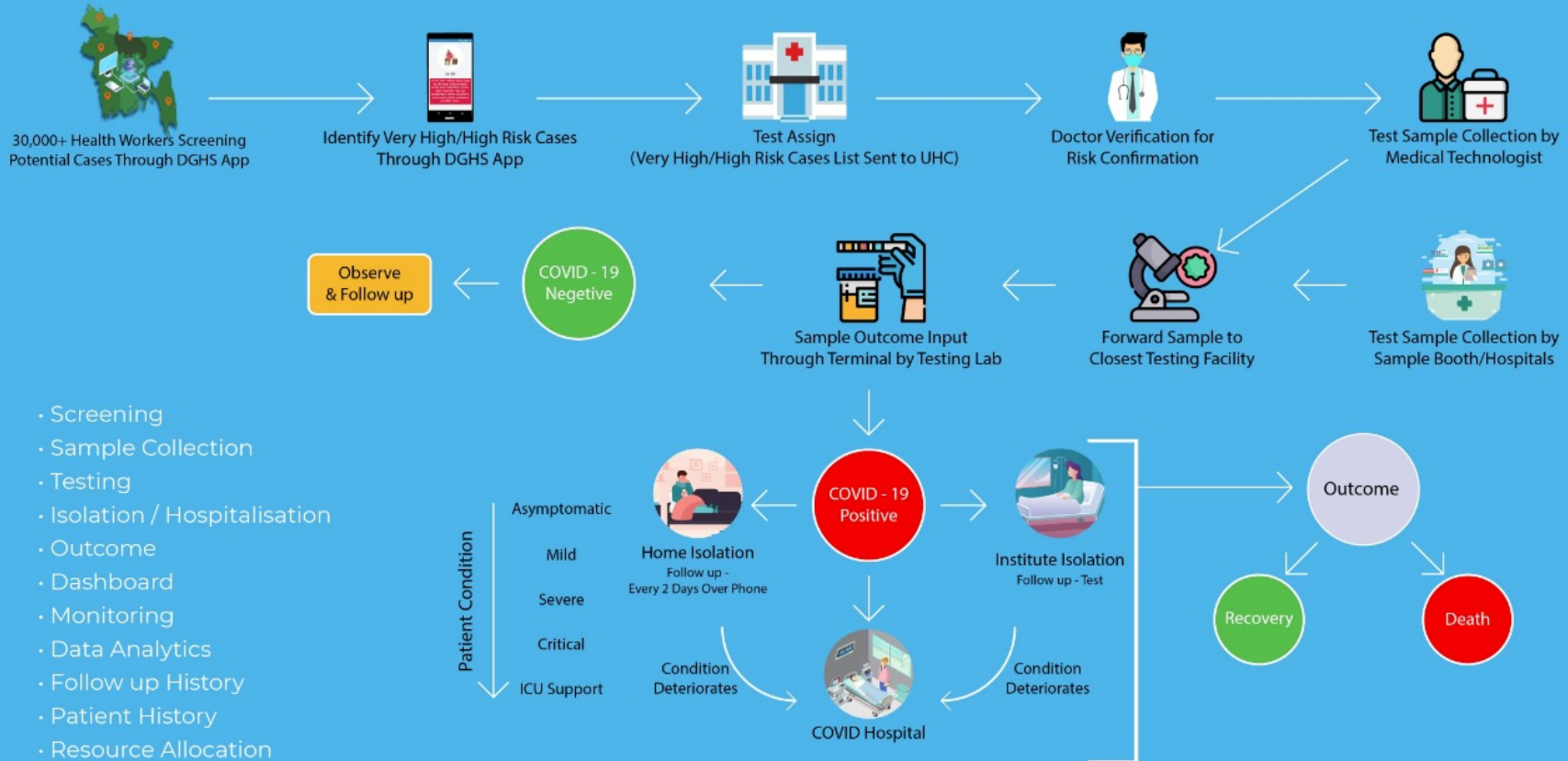
Features of COVID-19 Digital Surveillance Platform

- **Educate** the local populace about COVID-19
- Perform COVID-19 **Screening** at the community through registered health/field professionals/workers from their catchment areas
- Connect a suspected patient for online consultation through **govt. hotline**
- Screen family members of possible infected individuals for **contact tracing**
- Use of **AI for predicting/forecasting, classifying and visualizing** high risk zones or epicenter of coronavirus based on the collected screening data and understand dynamics of disease transmission for prevention
- Connect a suspected case with the lab facilities for **test appointment, sample collection and results**
- Connect a positive case to DGHS authorized facilities for further diagnostics, treatment and **isolation/hospitalization**
- Assist & support remote monitoring of **home-quarantine/isolated patients (Patient Monitoring)**
- Measure outcome of a patient through **tracking death and recovery status**
- Continuous data analysis for flattening the curve using different epidemiological models to help the government make lockdown **decision making & resource mapping**
- **Integrated COVID-19 Patient & Hospital Management System with National Dashboard**
- **COVID-19 Digital Remote Patient Monitoring and Virtual ICU System**
- **COVID-19 Test results verification system** for government services and immigration
- **COVID-19 Transmission control System** using Contact Tracing and Isolation



AI Based COVID-19 Digital Surveillance Platform

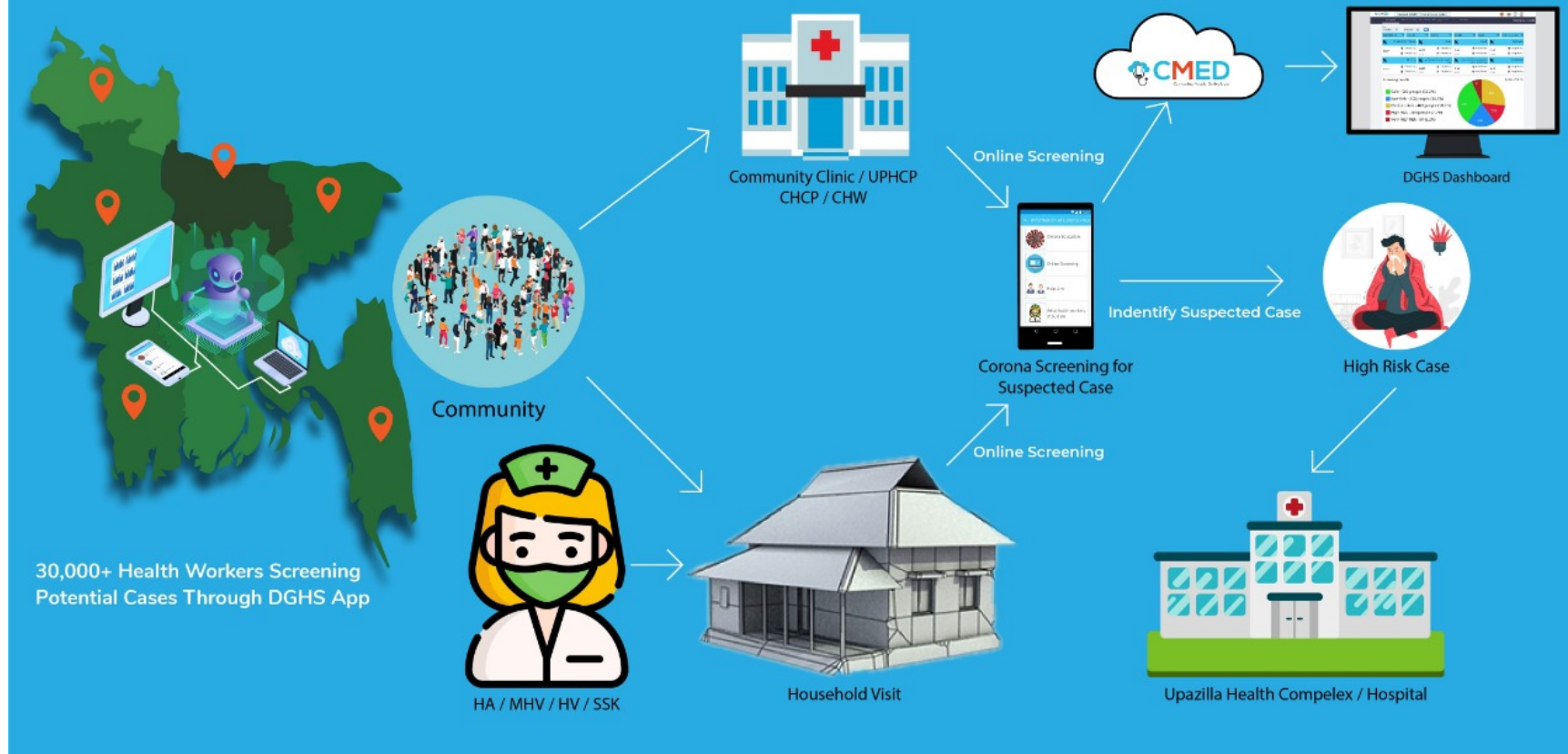
COVID - 19 Case Identification & Patient Outcome Management





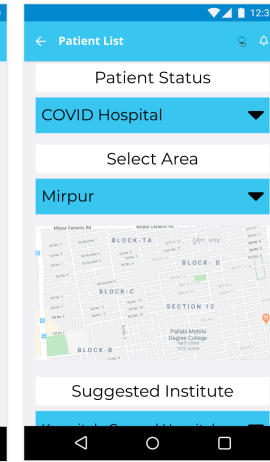
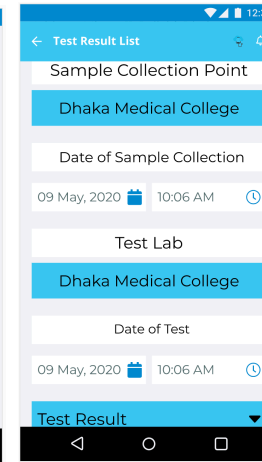
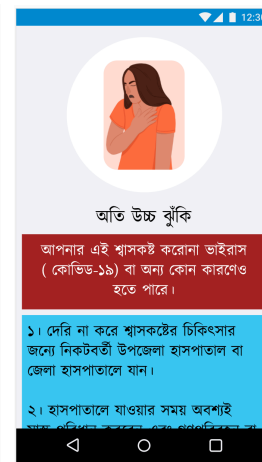
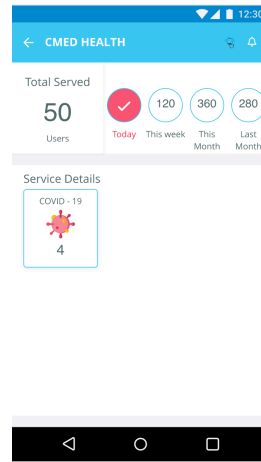
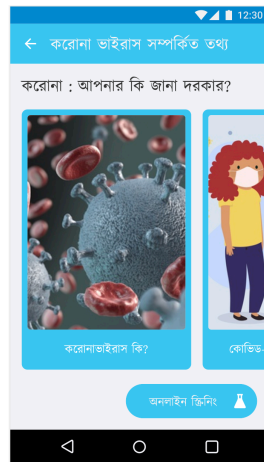
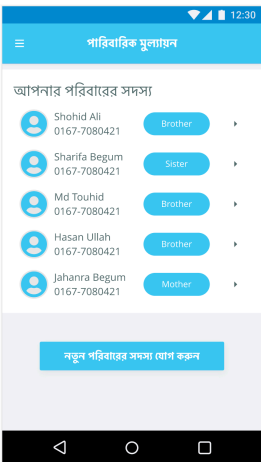
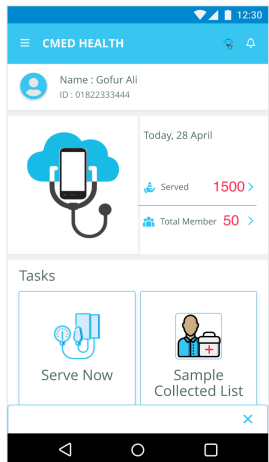
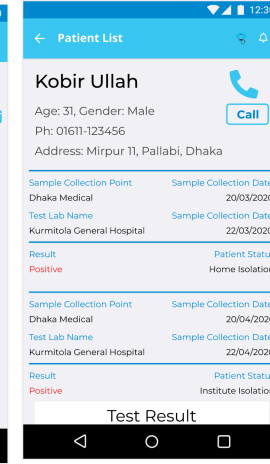
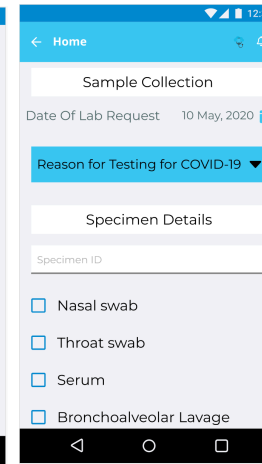
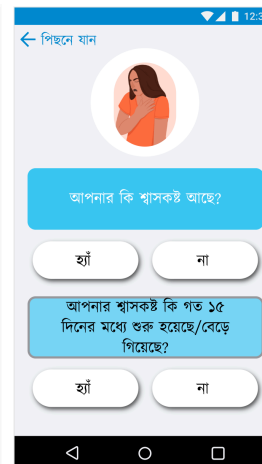
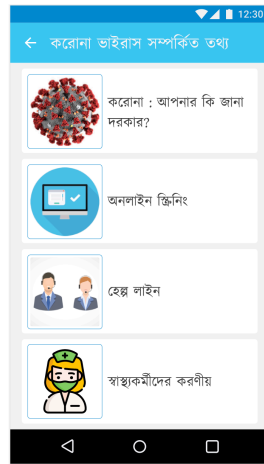
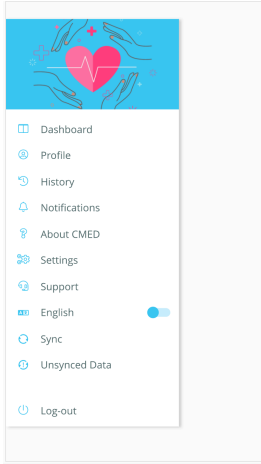
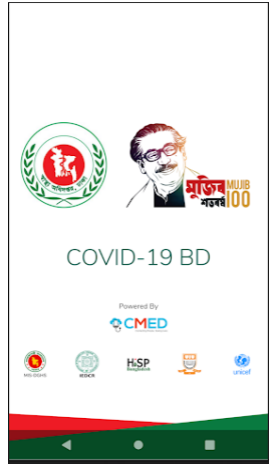
AI Based COVID-19 Digital Surveillance Platform

COVID-19 National Community Surveillance System



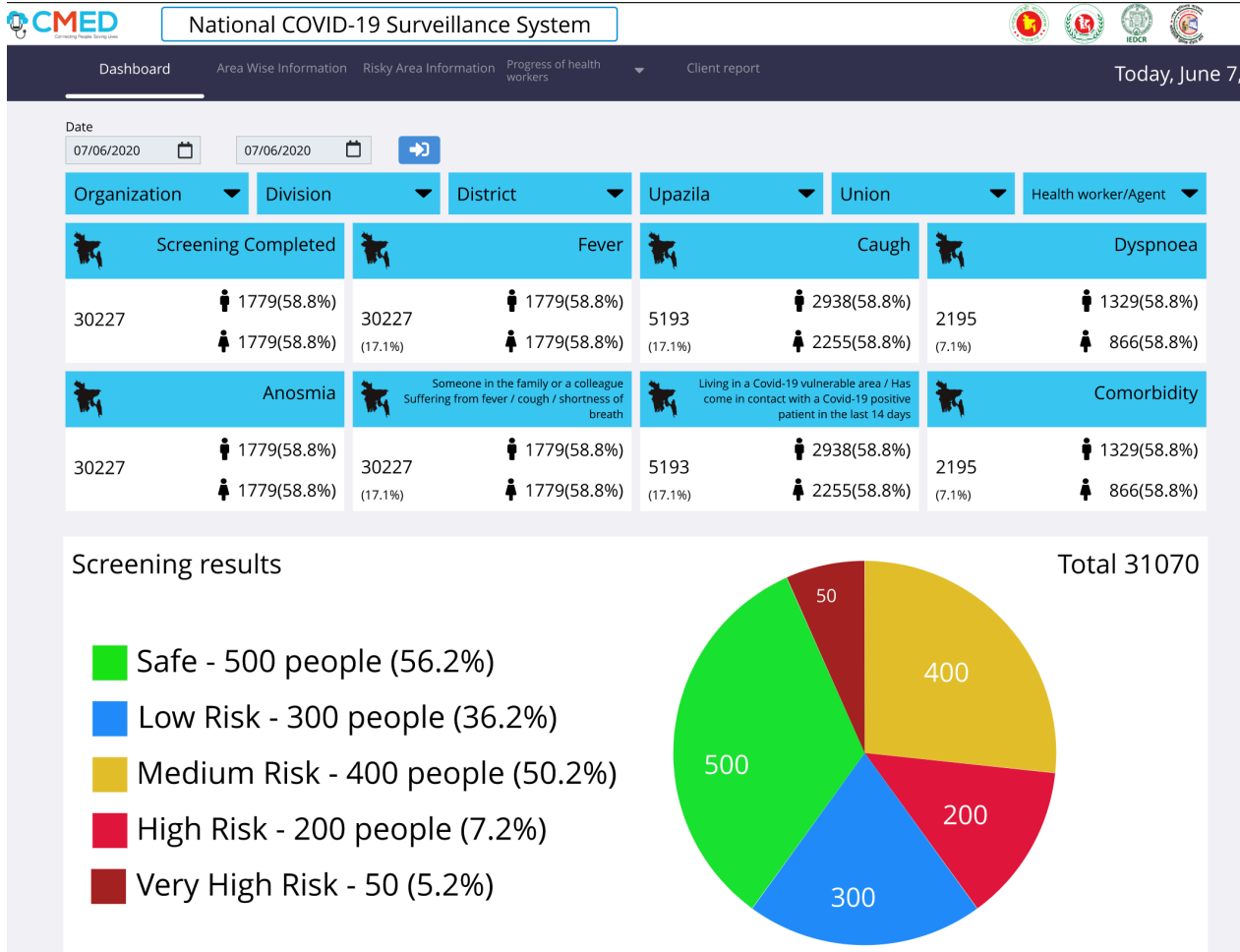


AI Based COVID-19 Digital Surveillance Platform





AI Based COVID-19 Digital Surveillance Platform



National
COVID-19
Surveillance
System
Dashboard
(Screening
Analytics)

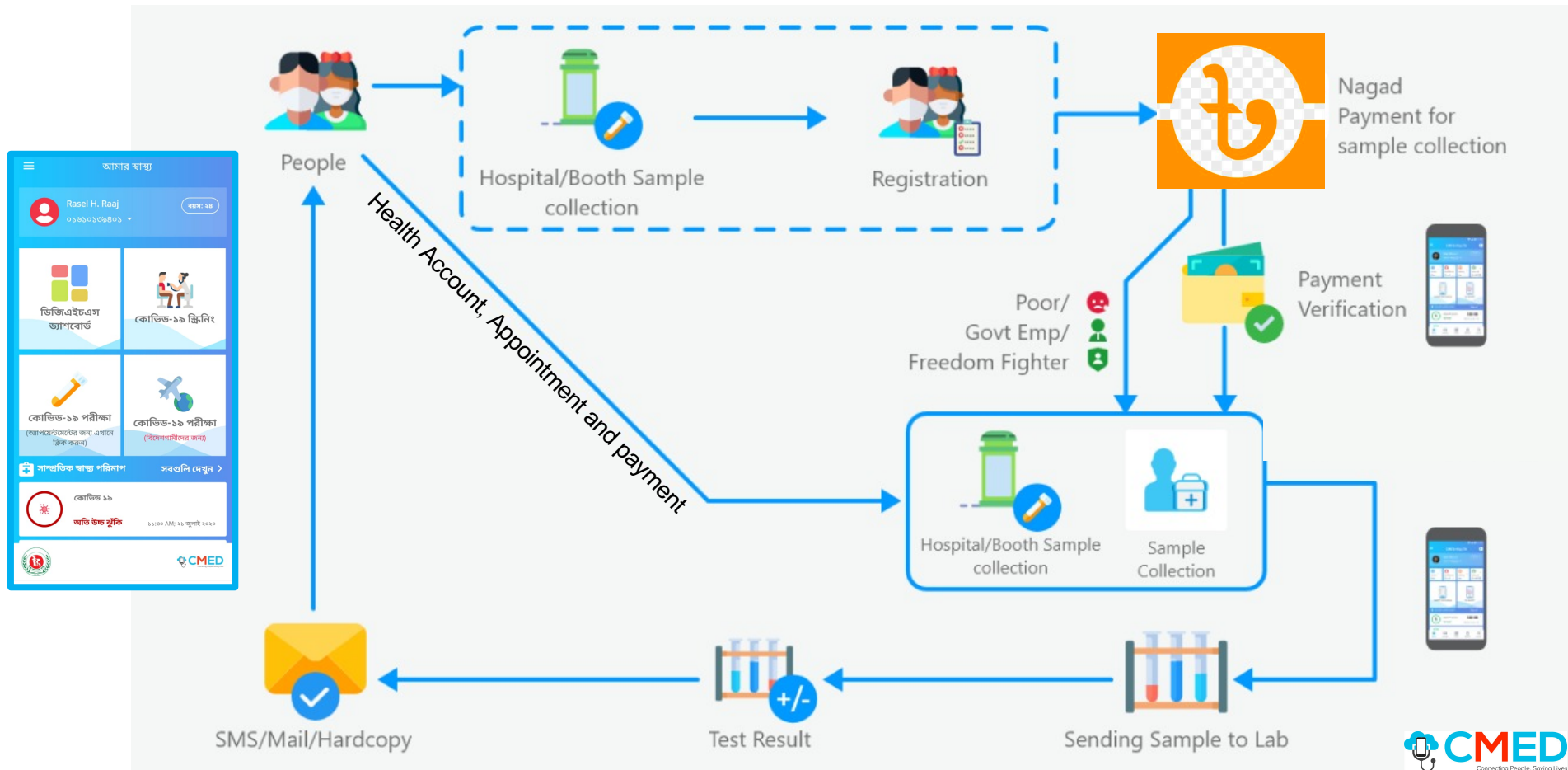
Nationwide
20,00,000+
People
Served

Screening
Analytics

<https://cmed.com.bd/covid-19-screening-analytics/>



COVID-19 Test Appointment, Payment Verification, Sample Collection and Results System





COVID-19 Test Appointment, Payment Verification, Sample Collection and Results System



Log Out

Sample Collection & Result

Sample Collection Report

Today, June 7,

Date

10/06/2020

10/06/2020



Division

District

Upazilla



Total Sample Collected: 875, Positive: 300

Last 24 Hours Sample Collection: 126, positive: 60



Dhaka

Total Sample Collected: 100
Positive: 60



Chattogram

Total Sample Collected: 100
Positive: 60



Rajshahi

Total Sample Collected: 100
Positive: 60



Mymensingh

Total Sample Collected: 100
Positive: 60



Sylhet

Total Sample Collected: 100
Positive: 60



Barisal

Total Sample Collected: 100
Positive: 60



Rangpur

Total Sample Collected: 100
Positive: 60

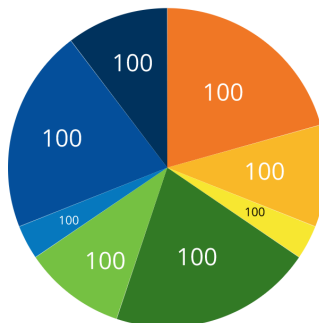


Khulna

Total Sample Collected: 100
Positive: 60

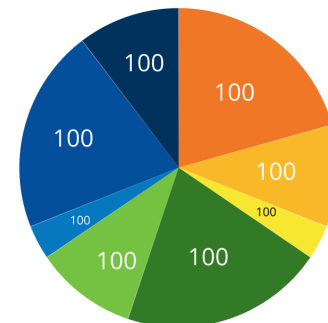
Division Wise Sample Collection Image

- Dhaka
- Khulna
- Barisal
- Chattogram
- Rangpur
- Rakshahi
- Mymensingh
- Sylhet



Division Wise Covid Positive Image

- Dhaka
- Khulna
- Barisal
- Chattogram
- Rangpur
- Rakshahi
- Mymensingh
- Sylhet



National
COVID-19
Surveillance
System
Dashboard
(Sample
Collection &
Lab Results)



COVID-19 Test Appointment, Payment Verification, Sample Collection and Results System


[Log Out](#)

Sample Collection & Result

Result Report

Today, June 7, 2020

Date: 10/06/2020 10/06/2020

Laboratory Name Sample Collection Point Result Test Status

View Only
25 50

Division District Upazila View Download

Serial	Sample Collection Point	Laboratory Name	Patient Name	Mobile No.	Division	District	Upazila	Collection Date	Test Date	Result
01	Dhaka Medical	Kurmitola Hospital	Abdul KORim	01611-123 456	Dhaka	Dhaka	Dhaka	10/06/2020	10/06/2020	Positive
02	Dhaka Medical	Kurmitola Hospital	Kobir Ullah	01611-123 456	Dhaka	Dhaka	Dhaka	10/06/2020	10/06/2020	Positive
03	Dhaka Medical	Kurmitola Hospital	Amir Hossain	01611-123 456	Dhaka	Dhaka	Dhaka	10/06/2020	10/06/2020	Negative
04	Dhaka Medical	Kurmitola Hospital	Korim	01611-123 456	Dhaka	Dhaka	Dhaka	10/06/2020	10/06/2020	Positive
05	Dhaka Medical	Kurmitola Hospital	Rohim	01611-123 456	Dhaka	Dhaka	Dhaka	10/06/2020	10/06/2020	Positive


[Log Out](#)

Sample Collection & Result

Sample Collection Report

Today, June 7, 2020

Date: 10/06/2020 10/06/2020

Division District Upazila View Download

View Only
25 50

Division District Upazila View Download

Serial	Collector's name	Designation	Mobile No.	Division	District	Upazila	Number of sample collected
01	Abdul Korim	Medical Technologist	01611-123 456	Dhaka	Dhaka	Dhaka	20
02	Abdul Korim	Medical Technologist	01611-123 456	Dhaka	Dhaka	Dhaka	20
03	Abdul Korim	Lab Technologist	01611-123 456	Dhaka	Dhaka	Dhaka	20
04	Abdul Korim	Medical Technologist	01611-123 456	Dhaka	Dhaka	Dhaka	20
05	Abdul Korim	Lab Technologist	01611-123 456	Dhaka	Dhaka	Dhaka	20



COVID-19 Test Report

IEDCR

Patient Name: Amir Hossain Phone No: 01611-123 456
Age: 31; Male Address: Mirpur 11, Dhaka, Pallabi

Sample Collection Point: Dhaka Medical Sample Collection Date: 20/03/2020
Lab Name: Kurmitola General Hospital Date of Test: 22/03/2020

Result: **Positive**

Sample Collection Point: Dhaka Medical Sample Collection Date: 20/04/2020
Lab Name: Kurmitola General Hospital Date of Test: 22/04/2020

Result: **Positive**

Sample Collection Point: Dhaka Medical Sample Collection Date: 20/05/2020
Lab Name: Kurmitola General Hospital Date of Test: 22/05/2020

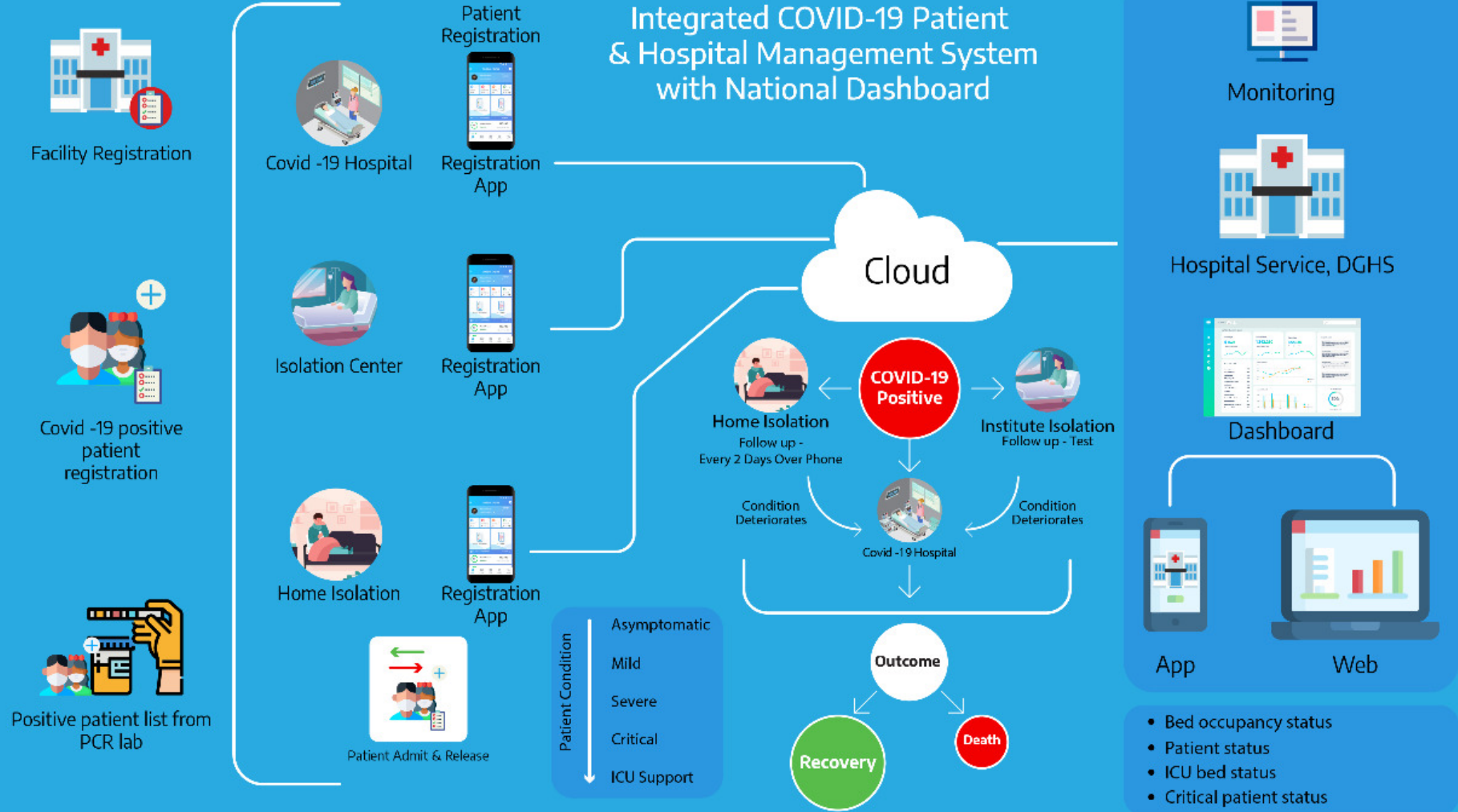
Result: **Negative**

Sample Collection Point: Dhaka Medical Sample Collection Date: 08/06/2020
Lab Name: Kurmitola General Hospital Date of Test: 10/06/2020

Result: **Negative**

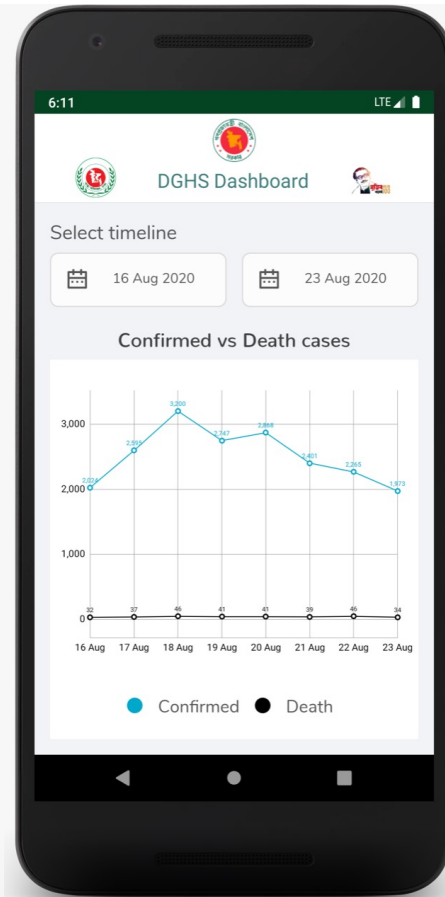
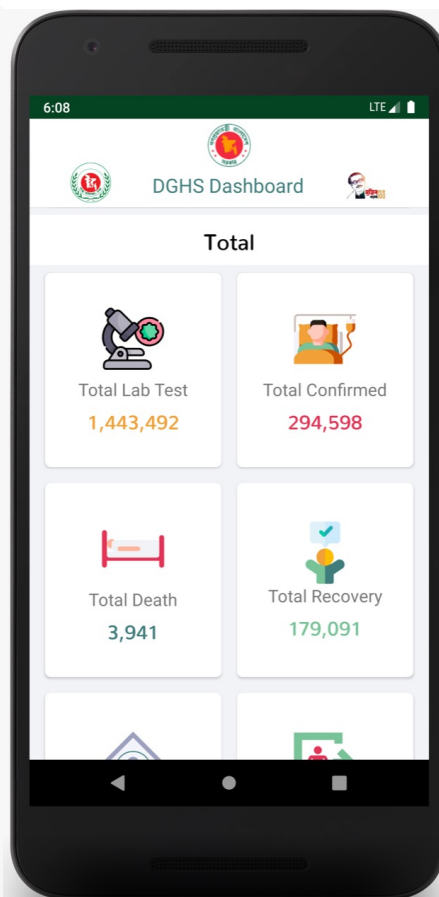
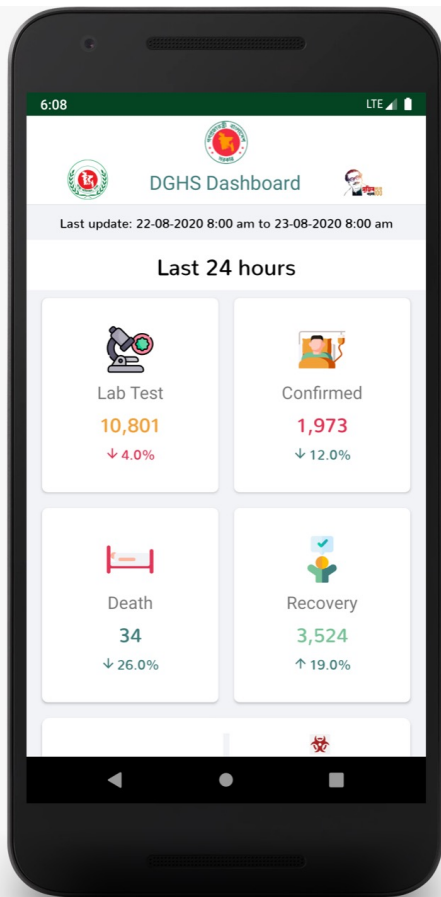
National COVID-19 Surveillance System
Dashboard (Sample Collection & Lab Results)

Integrated COVID-19 Patient & Hospital Management System with National Dashboard



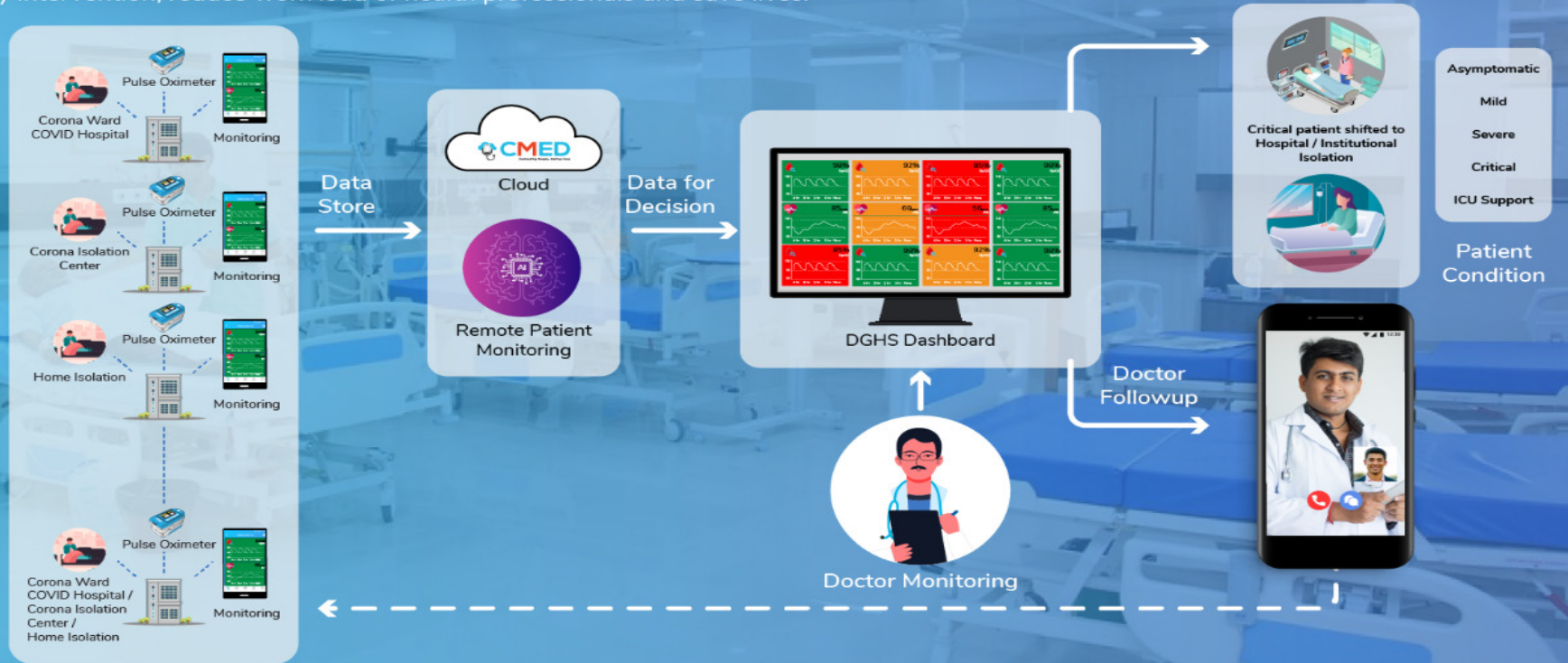


DGHS Dashboard App (Android & iOS) for COVID-19 Updates

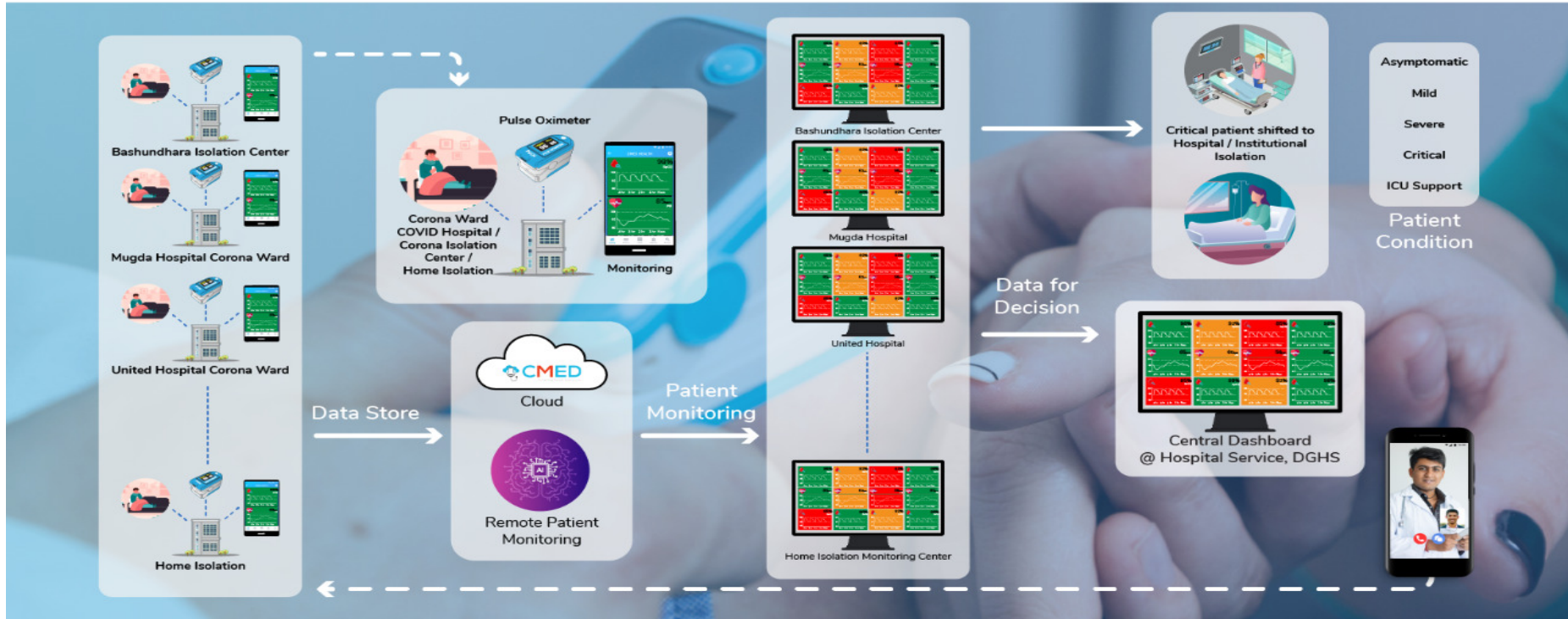


COVID-19 Digital Remote Patient Monitoring & Virtual ICU System

Digital remote patient monitoring and virtual ICU system: The system uses technology to monitor patient health outside of a traditional clinical settings, such as in home or in a hospital. It collects level of oxygen in patient's blood along with heart rate, alerts the health care provider if oxygen levels drop below safe levels and assess the need for clinical intervention such as supplemental oxygen. This system can play significant role for monitoring covid-19 patients in different settings like, COVID-19 hospital, isolation center and home isolation to make timely intervention, reduce work load of health professionals and save lives.



COVID-19 Digital Remote Patient Monitoring & Virtual ICU System



Patient Benefits:

- Easy to use
- Fast, accurate, continuous monitoring
- Early detection and earlier intervention
- Minimized complications
- Reduction in hospitalization
- Improved patient management

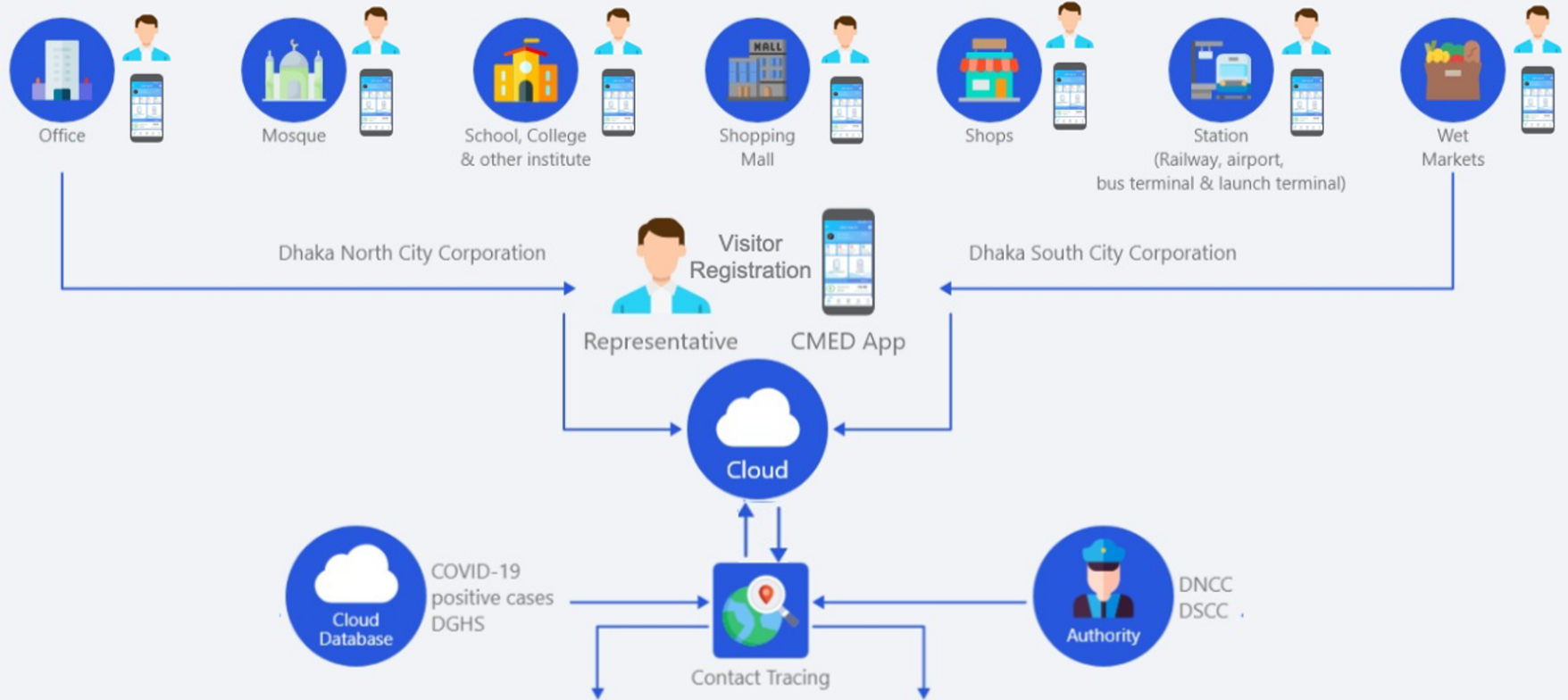
Doctors and Hospital benefits:

- Continuous patient monitoring data streaming could provide real-time patient supervision.
- Balances out the workload and time; no need for rounds to assess patients in such cases.
- Better utilization of medical resources such as the equipment, medical staff, and others.

Regulatory Benefits:

- Central monitoring of covid-19 patients
 - Optimize resource mobilization
- Data based decision and intervention
 - Better access to healthcare system

COVID-19 Transmission Control System using Contact Tracing and Isolation



- Relaxing Lockdown
- Increasing Risk of Transmission
- Intelligence System to Control Transmission

- Record Visitor Phone Number only
- Visit Date & Time of the Place
- Automatic Identification of Contacts

Transmission control

COVID-19 Transmission Control System using Contact Tracing and Isolation



Office



Mosque



School, College
& other institute



Shopping
Mall



Shops



Station
(Railway, airport,
bus terminal & launch terminal)



Wet
Markets

Generic Alert for Public

COVID-19 Health Alert

Location	Area	Date	Time
KFC	Dhanmondi	Sat 25 July 20	8.30PM – 10.30PM
Robi	Gulshan 1	Sun 26 July 20	11.30PM – 4.30PM
Azad Masjid	Gulshan	Fri 24 July 20	12.30PM – 2.30PM

People who attended these locations at the relevant should:

- *Immediately self-isolate for 14 days from the day you were at the location*
- *Seek testing for COVID-19, even if you don't have any symptoms*

Alert for Individual

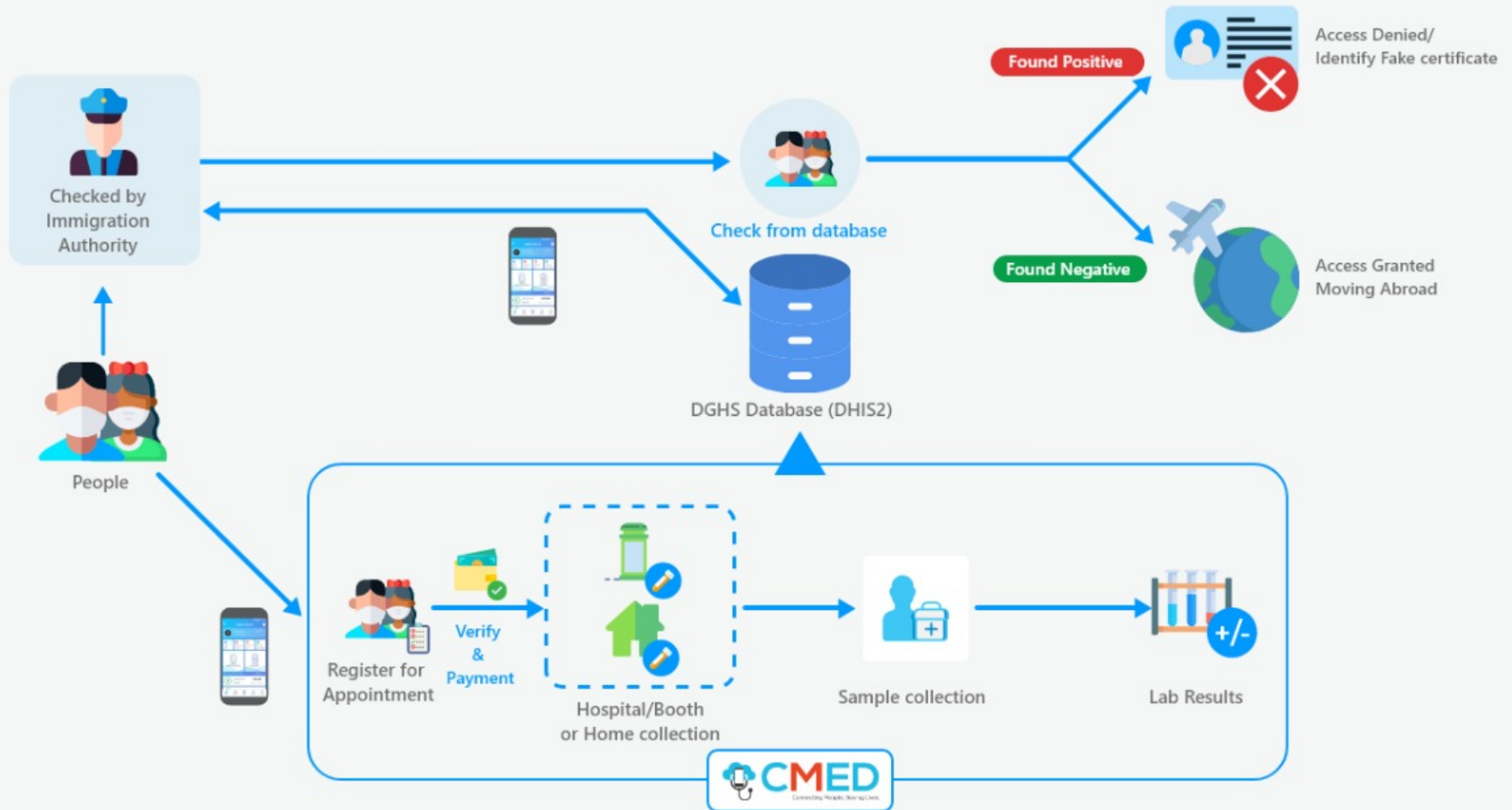
COVID-19 Health Alert

Location	Robi
Area	Gulshan 1
Date	Sun 26 July 20
Time	11.30PM – 4.30PM

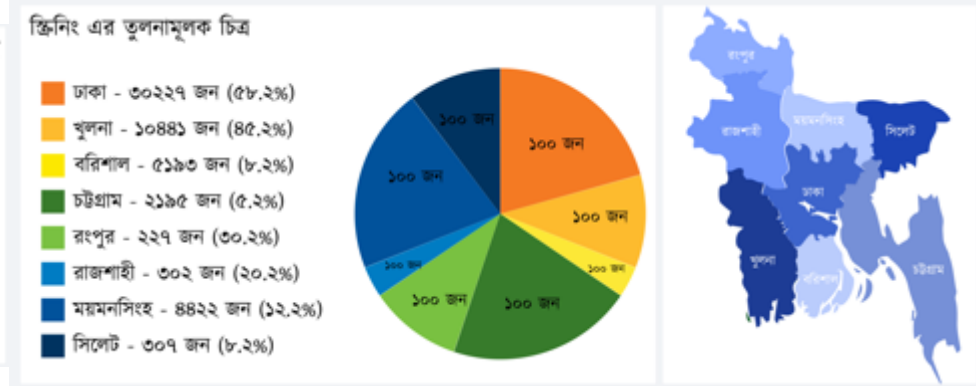
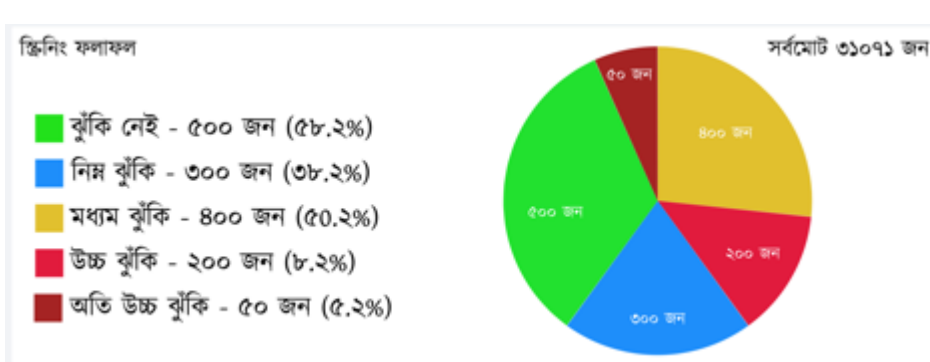
You are a potential contact case as you attended above location:

- *Immediately self-isolate for 14 days*
- *Seek testing for COVID-19, even if you don't have any symptoms*

Corona Test Certificate Verification System



AI Based COVID-19 Digital Surveillance Dashboard



Initiative & Implementation

Research

Development & Maintenance





CMED

Connecting People, Saving Lives



Last Mile Health Service for
Universal Health Coverage



IoT enabled Artificial Intelligence Driven Cloud based Preventive and Primary Care Platform

Affordable

Accessible

Easy to Use

Sustainable



CMED Health Objectives

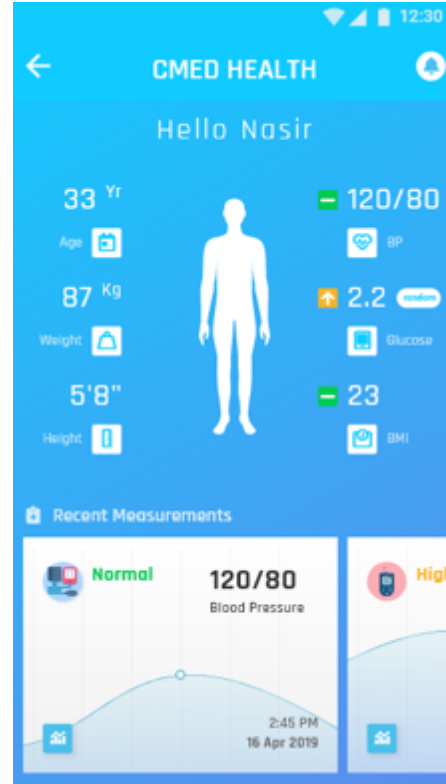
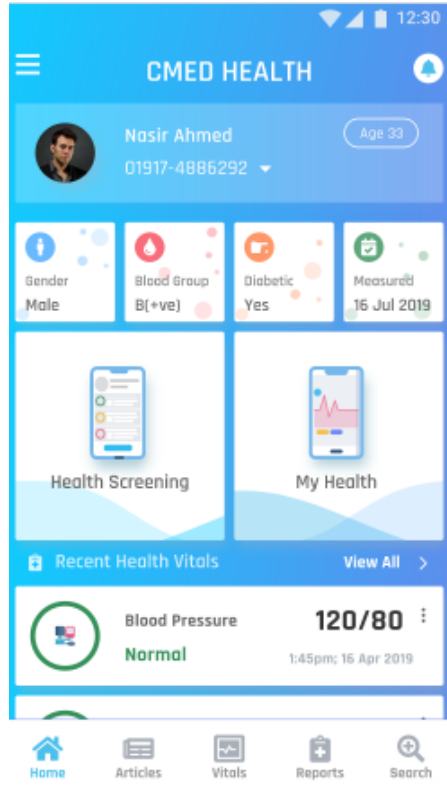
Connecting People, Saving Lives

What CMED comes with?

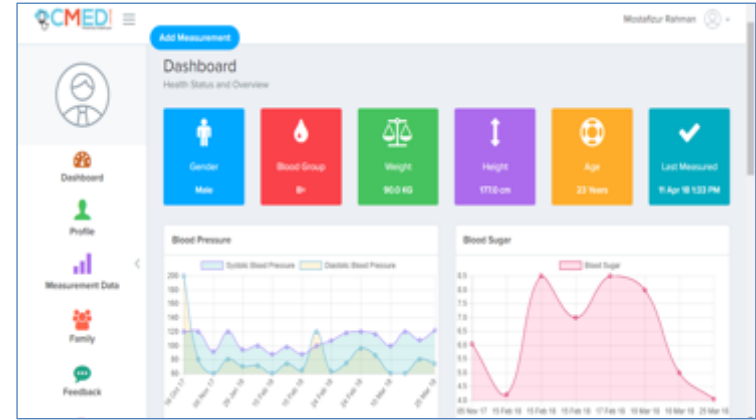
- Health **Monitoring**
- Health **Risk Assessment**
- Health **Education and Awareness**
- **Prevent NCDs**
- Ubiquitous **Access to data**
- Create **Referral System**



User App & Dashboard



Personal Dashboard



CMED HEALTH

Ap# C-5, House# 781, Safa Green, Salmiya Road, Dhamani, Shaka-3209

Date: 15/1/2018
Name: Imrul Kayes
CMED ID: 01712615061
Date of Birth: 07 January 1981
Blood Group: O+

CMED Health Screening Report

Type	Date	Result	Status	Remarks
SPO2	15 Jan 18 8:10 PM	99.0%	Normal	Normal Range: 95.0 - 100.0
PULSE	15 Jan 18 8:10 PM	91.0 bpm	Normal	Normal Range: 60.0 - 100.0
PULSE	15 Jan 18 8:13 PM	92.0 bpm	Normal	Normal Range: 60.0 - 100.0
BLOOD PRESSURE	15 Jan 18 8:13 PM	Sys: 116.0 Dia: 79.0	Normal	Normal Range: Sys(90-120) Dia(63-80)
BMI	15 Jan 18 8:14 PM	BMI: 27.76 Weight: 85.0 KG Height: 5' 9"	Overweight	Normal Range: 18.5 - 24.9
BLOOD SUGAR	15 Jan 18 8:17 PM	10.33 mmol/l	High Random	Normal Range: 3.3 - 7.8

© 2018, CMED Health

Health Report Sharing

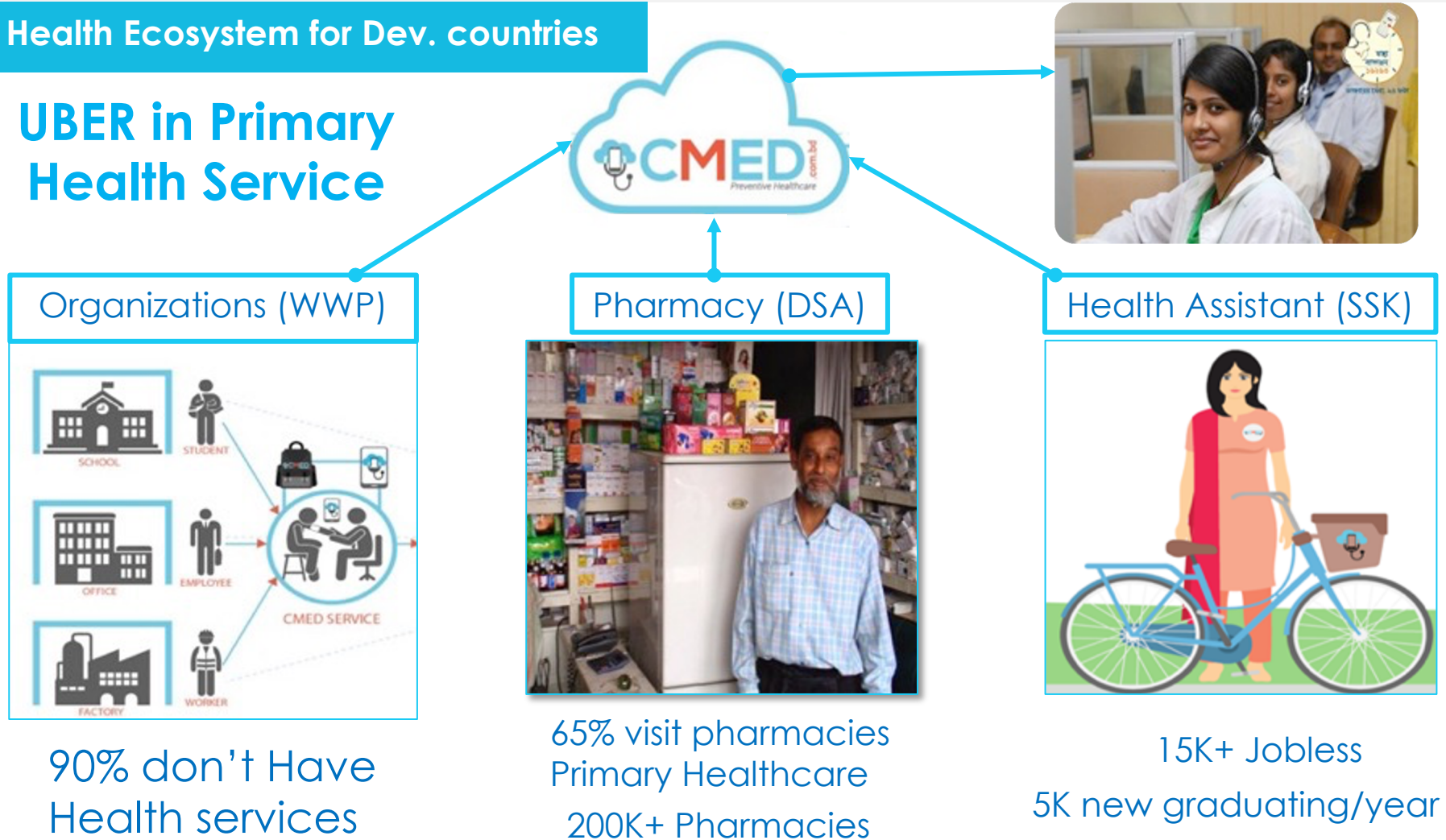


Health Report

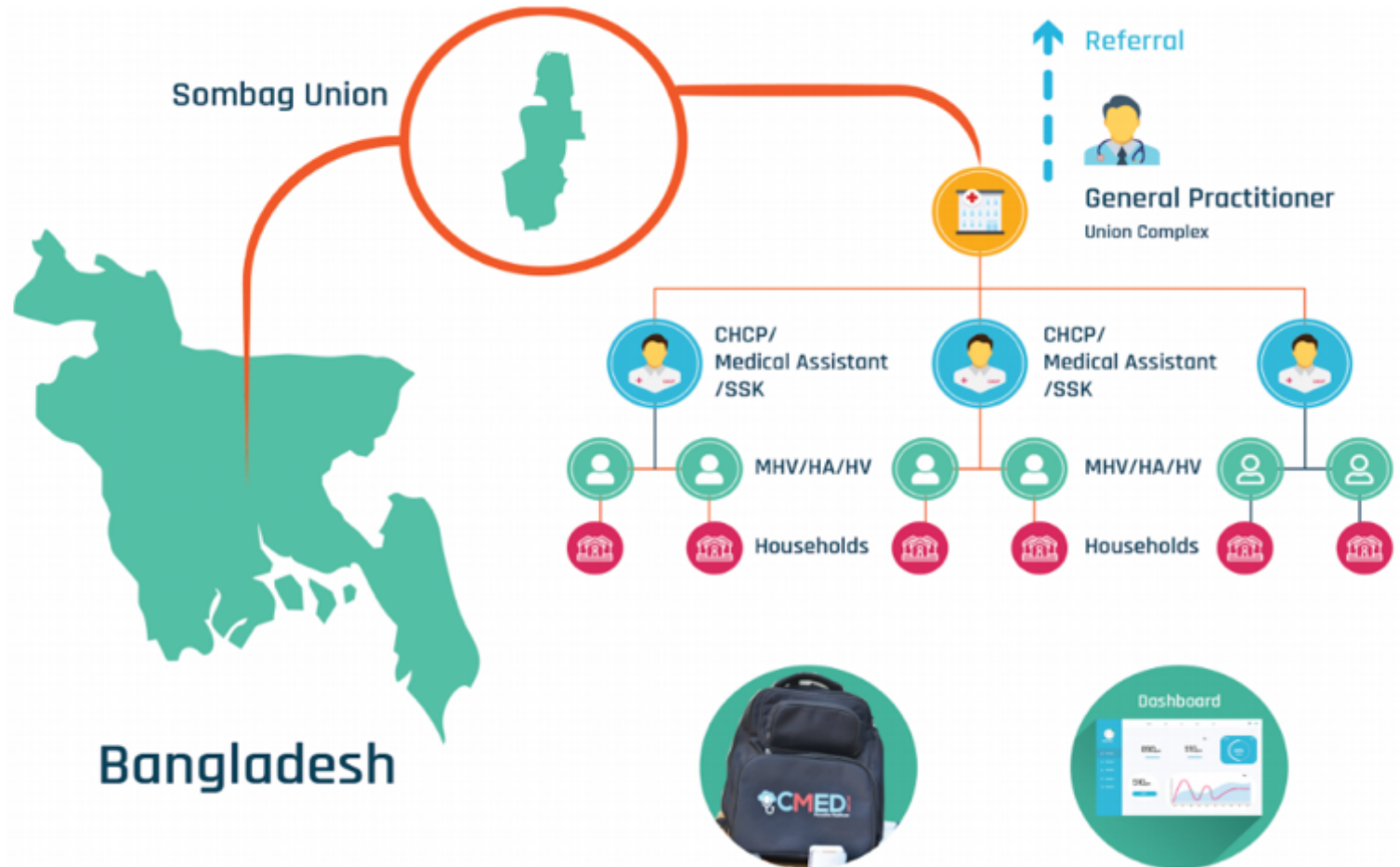
AI4H : Mobile & Cloud based Service Model

Health Ecosystem for Dev. countries

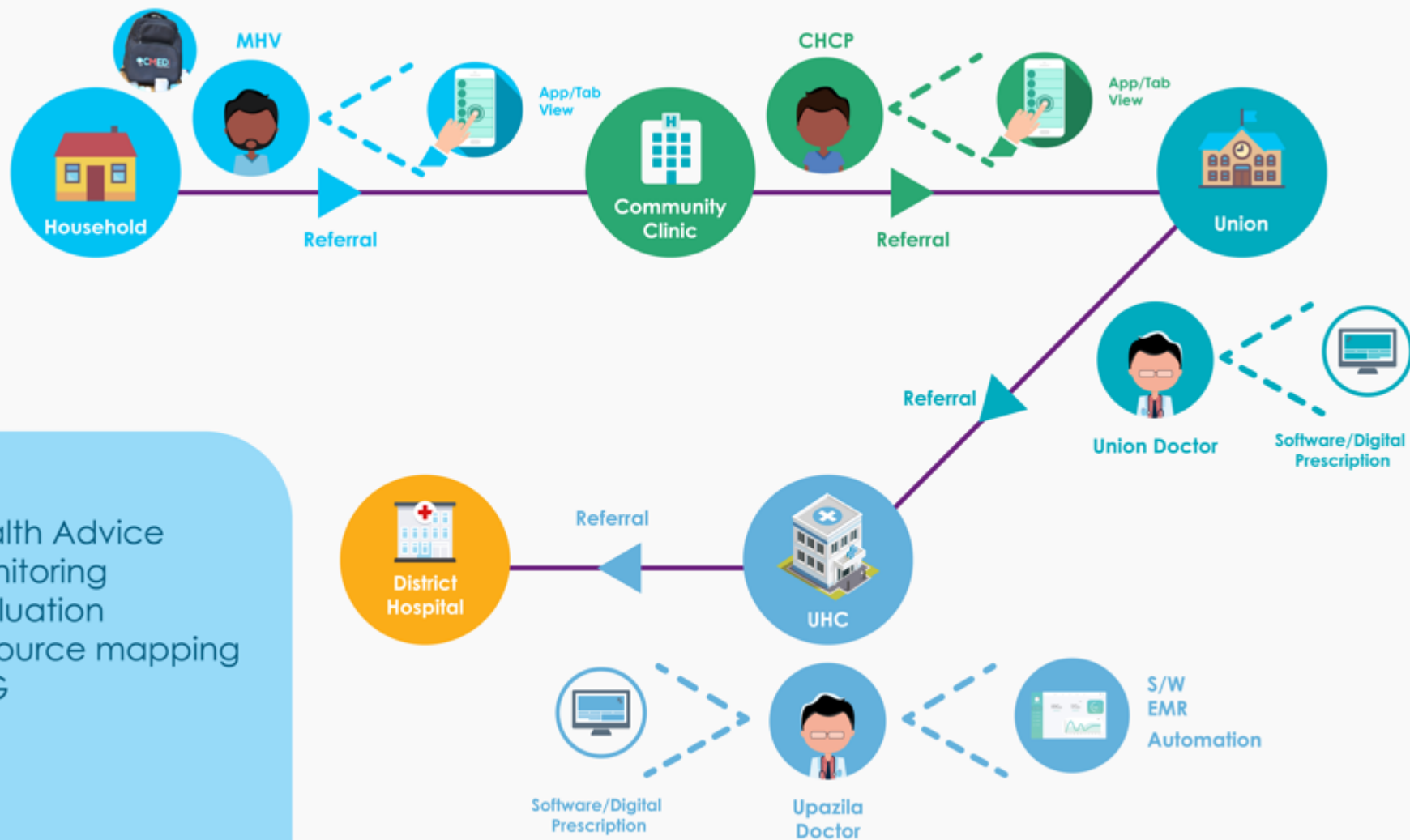
UBER in Primary Health Service



General Practitioner (GP) Model @ Union Level for Primary Healthcare Service

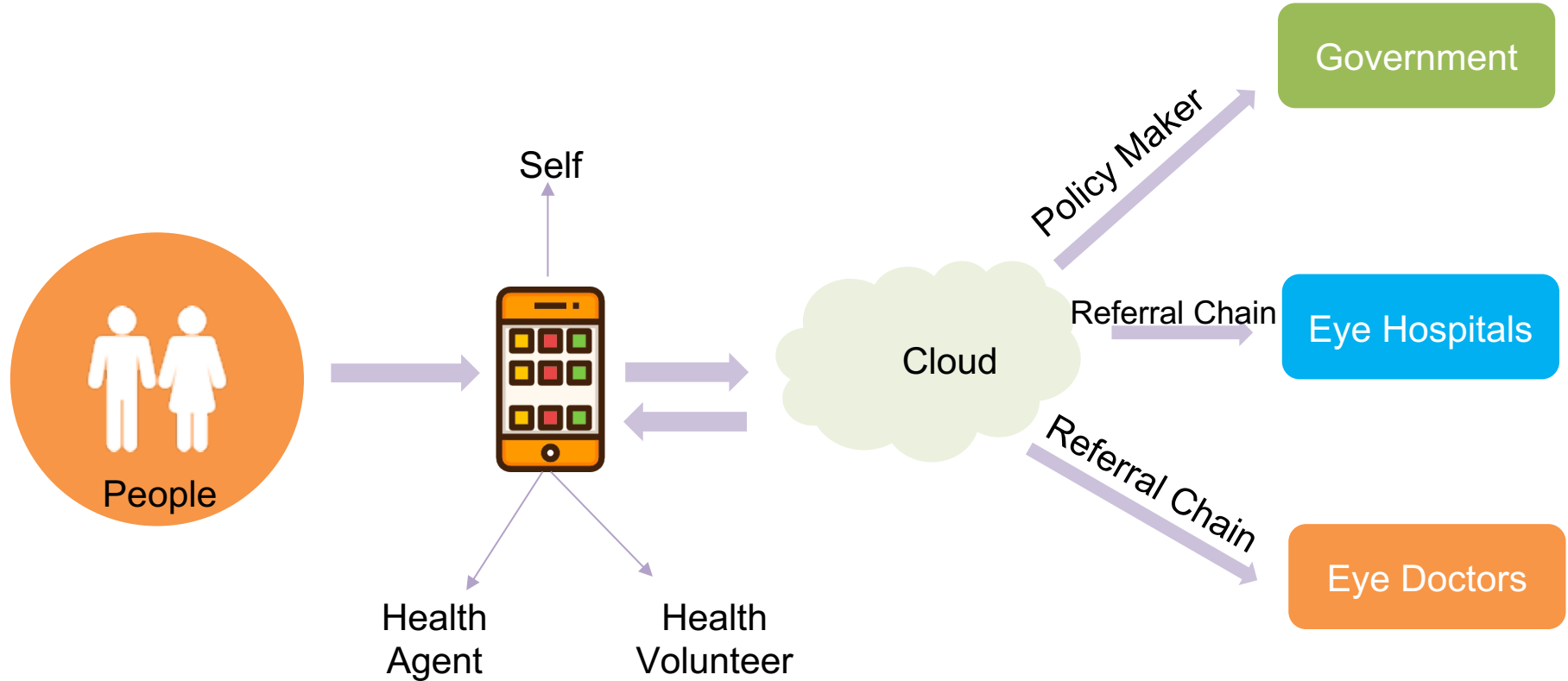


GP Model and Referrals System from Primary, Secondary & Tertiary Care



- Health Advice
- Monitoring
- Evaluation
- Resource mapping
- SDG

Virtual Eye Doc: AI based Smart Mobile App for Eye Care



PVDoc: AI based Parkinson's Virtual Doctor

**Cloud based AI Driven Screening
and Monitoring System for
Parkinson's Diseases**

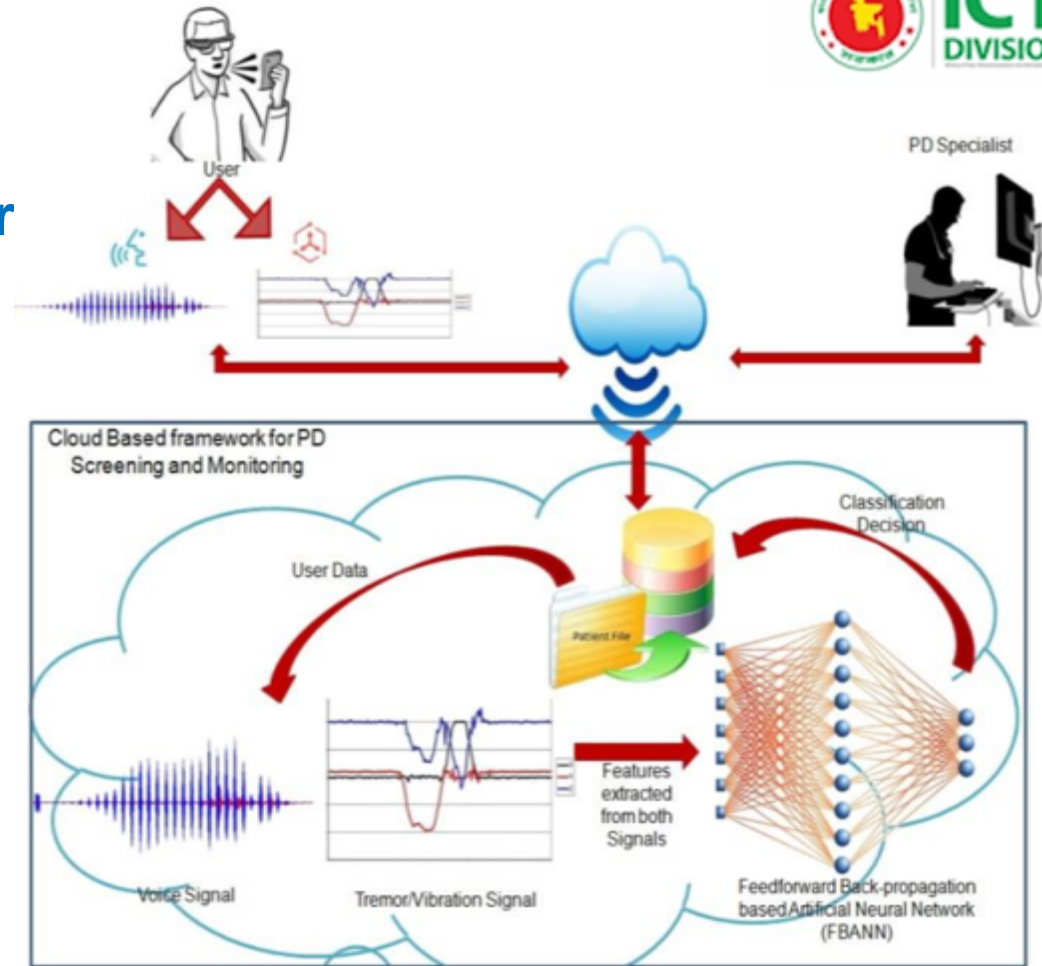


Figure 1. PVDoctor framework with its primary users.

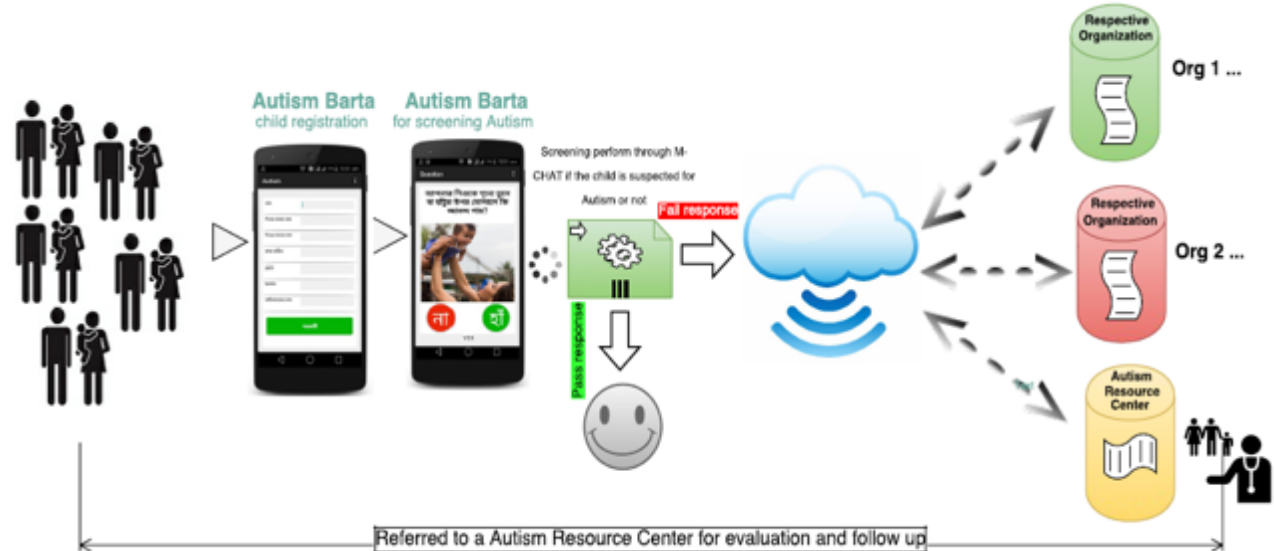


জাতীয় প্রতিবন্ধী উন্নয়ন ফাউন্ডেশন
সমাজকল্যাণ মন্ত্রণালয়



AIMS Lab
Advanced Intelligent Multidisciplinary Systems Lab

Autism Barta: Automated Autism Screening Tools



Service Delivery

