DETECTING SYMPTOMS OF COVID 19

Al Sharkia COVID-19 Interactive Map & Advisory Website.

Dr: Nabil Moustafa.

Eng: Safa Mohamed.

Faculty of Computers and Informatics - Zagazig University
Department of IS 2020- 2021

Al-Sharkia COVID-19 Interactive Map & Advisory Website

Supervision Committee
Dr. Nabil Moustafa
Eng. Safa Mohamed

❖ Team Members:

- Mahmoud Bakri Abd Samea Ahmed Werawer.
- Mohamed Hesham ElSayed Mohamed Makawy.
- Mohamed Nazeh Mohamed Amin.
- Ahmed Mahmoud Mahmoud El-Gaied.
- Amina Gamal Ahmed Abd El-Gawad.
- Sara Ahmed Abdelfatah kotop.

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FINALLY, we hope that our project obtains your attention and specification.

Team Members

Abstract.

The epidemic called covid-19, which affected all countries of the world and its negative impact, which led to losses and weakness in many areas of countries, especially the economic field, that is today's plague and a pandemic threatening life on the planet so many countries have taken information technology as their first line of defense against Corona such as china and South Korea that used the artificial intelligence & data science to track & overcome the virus, and great companies such as facebook, & alibaba, so we decided to establish a website to help the Governorate to deal with the emerging corona epidemic, limit the spread of this disease and reduce the burden on hospitals in diagnosing and treating people with the disease, helping them to reach the nearest medical center to recover from the Corona epidemic and embeds a map includes full information about available hospitals and the vaccines in AL-sharkia where the users can make use of it. So we expect that helping the governante to limit the number of infected people by spreading awareness between people and solve the the highly need of doctors for diagnosing the patients by building an expert system for covid-19 that diagnoses patient which specifies his condintion and define if he has the covid or not? and if he has? what should he does? what're the appropriate medicines for him?, and his condition is very sever we will help him to get the closest hospitals.

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CHAPTER ONE

INTRODUCTION

1. Chapter One: Introduction.

1.1 Introduction.

The following chapter shows the project significance, describes the motivation and purposes of this project, also provides a summary of the contents and structure of the documentation.

1.2 What Is Covid-19?

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans.

1.3 How Does Covid-19 Spread?

The virus is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing). Individuals can also be infected from and touching surfaces contaminated with the virus and touching their face (e.g., eyes, nose,

mouth). The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it.

1.4 System Requirement Specification “SRS”.

1.4.1 Problem Definition

The epidemic called covid-19, which affected all countries of the world and its negative impact, which led to losses and weakness in many areas of countries, especially the economic field, that is today's plague and a pandemic threatening life on the planet, so countries tried to confront it and overcome it in various ways and means, as medical laboratories have become In a race against time to monitor the pandemic and try to discover a cure, many countries have taken information technology as their first line of defense against Corona, such as China, where they used artificial intelligence and data science to track and overcome the virus, and other giant companies such as Facebook as they cooperate with researchers from Harvard and Taiwan universities and share data Anonymous about the movement of people, population density maps and their use of the social network and its data analysis to find solutions to predict the spread of the virus, and Alibaba, which built a smart diagnostic system based on artificial intelligence that increases the speed of diagnosis and much more, and then information technology plays a vital

and major role In the fight against Corona virus, and we wanted to join the world as possible to face overcoming the epidemic called Covid-19.

1.4.2 Background & Motivation.

- Many countries have taken information technology as their first line of defense against Corona such as.

China and South Korea:

They used the artificial intelligence & data science to track & overcome the virus.

- **GIANT COMPANIES & CURRENT SYSTEMS.**

Facebook.

Facebook cooperates with researchers from Harvard and Taiwan universities and shares anonymous data on the movement of people, & population density maps and their use of the social network and analyzing its data to find solutions to predict the spread and movements of the virus.

Alibaba.

Alibaba has built a smart diagnostic system based on artificial intelligence, which increases the speed of diagnosis, and more....

- **Result:**

The information technology plays a vital and major role in combating the Corona virus, and We wanted to join the world as we can face and overcome the pandemic that is called Covid-19.

1.4.3 Proposed Solution.

Establish a website to help the Governorate to deal with the emerging corona epidemic, limit the spread of this disease and reduce the burden on hospitals in diagnosing and treating people with the disease, helping them to reach the nearest medical center to recover from the Corona epidemic and preparing a database for easy access of the vaccine against the disease to citizens.

1.4.4 Advantages of the System.

- Awareness of people about the precautionary instructions that protect them from the danger of the Corona virus.
- Awareness of people about what the last news about covid-19 are?
- Diagnosing the patient, determining his condition, knowing his level of infection with the Coronavirus, and determining his appropriate treatment protocol for (moderate & Mild) case.
- Determine the medical places such as hospitals to determine the available and nearest hospitals to patients.
- Reducing the time period that the injured person needs to reach the medical place.

- Determine the empty places in hospitals to receive those infected with the Coronavirus.
- Determine the readiness of hospitals to receive emergency cases infected with the Coronavirus.

1.5 Project Methodology.

A methodology is a formalized approach to implementing the SDLC (it is a list of steps and deliverables). They vary in terms of the progression that is followed through the phases of the SDLC.

➢ **Waterfall Development Model.**

In Our project we will use the waterfall development model to Implement the SDLC and develop our project. With Waterfall Development, analysts and programmer proceed Sequentially from one phase to the next.

Waterfall Development Methodologies have the advantage of identifying requirement long before programming begins and limiting changes to the requirement as the project proceeds.

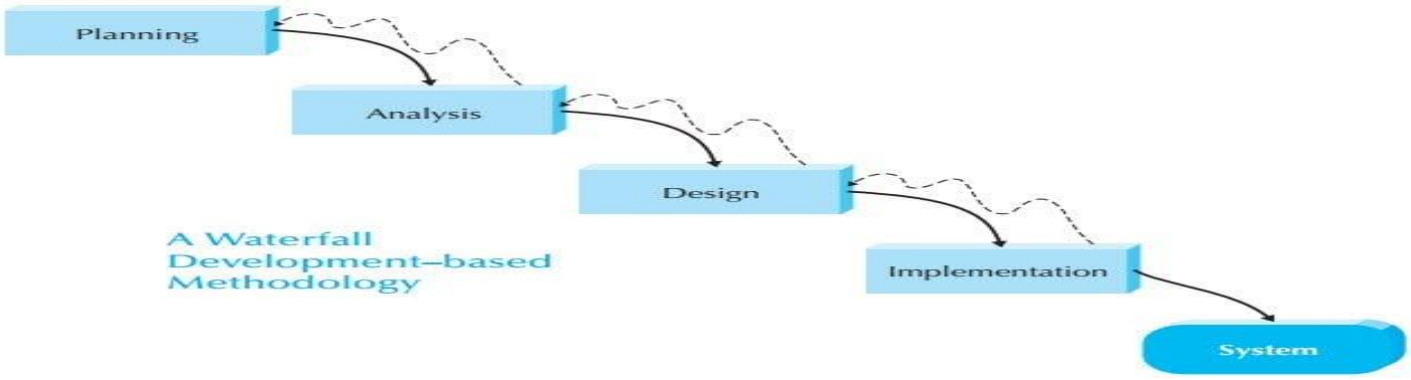


Figure 1 Project Methodology

1.6 System Development Life Cycle.

A system development life cycle (**SDLC**): is a conceptual model, used in project management, to describe the stages and tasks involved in each step of a project to write and deploy software. It helps in producing a software with the highest quality and lowest.

cost in the shortest time. SDLC includes a detailed plan for how to develop, alter, maintain, and replace a software system.

Suggest that the SDLC phases proceed in a logical path start to finish in some projects, this is true. In many projects, however the project team moves through the steps consecutively, incrementally, iteratively, or in other pattern. Different projects may emphasize different parts of the SDLC or approach the SDLC phases in different ways, but all projects have following four phases in their software development life cycle model:

1) System Planning.

2) System Analysis.

3) System Design.

4) Implementation.

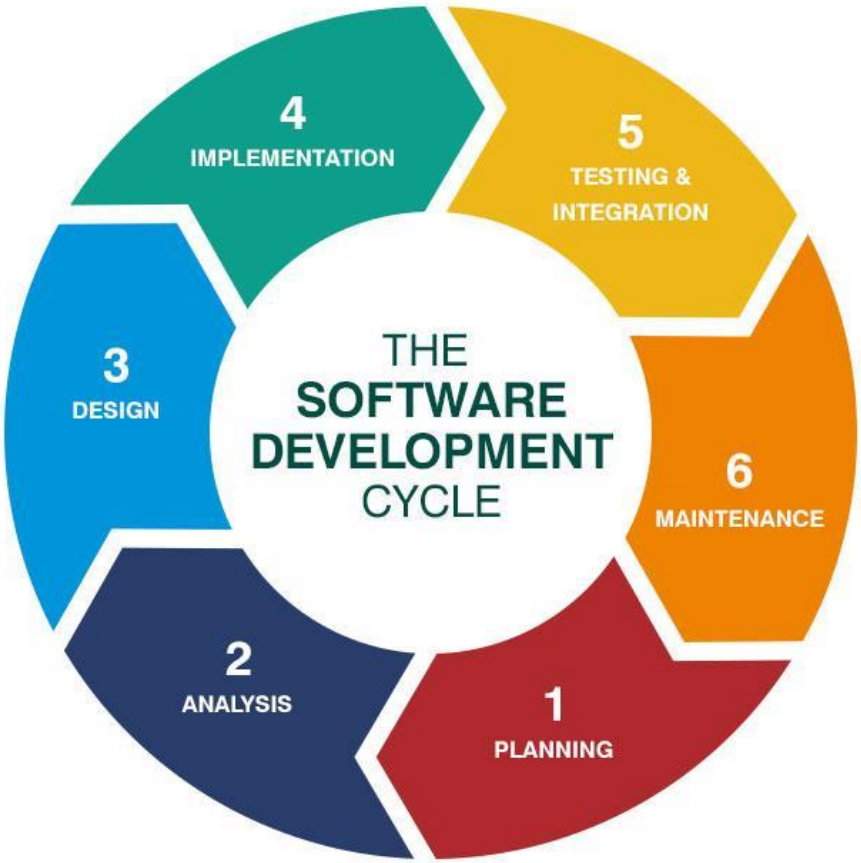


Figure 2 SDLC

1.7 What Is Expert System?

Expert system is a computer system emulating the decision-making ability of a human expert. Expert systems are designed to solve complex problems by **reasoning** through bodies of knowledge, represented mainly as **if–then rules** rather than through conventional **procedural code**. The first expert systems were created in the 1970s and then

proliferated in the 1980s. Expert systems were among the first truly successful forms of **artificial intelligence** (AI) software.

An expert system is divided into two subsystems: the **inference engine** and the **knowledge base**. The knowledge base represents facts and rules. The inference engine applies the rules to the known facts to deduce new facts. Inference engines can also include explanation and debugging abilities.

1.8 Advantages of Expert System.

- Reduces the cost of consulting an expert for solving the problem.
- Provide a quick and efficient solution to a problem.
- Offers high reliability.
- It can tackle a very complex problem that is difficult for a human expert to solve.
- Gathers scare expertise and use it efficiently.
- Consistency – they provide consistent answers for repetitive decisions.
- The expert system is available 24/7 and is never on holiday or off sick when needed.
- The computer uses all the information it has, unlike a human expert who may forget and make mistakes.

- Capture expertise before it is lost.
- Reduce dependence upon one expert.
- Reduce/eliminate error and inconsistency.
- Allow non-experts to reach scientifically supportable conclusions.
- Knowledge sharing
- Automation and improve decisions.
- Dissemination expertise and normalization decisions.

1.9 Applications of Expert System.

- Information management.
- Hospitals and medical facilities.
- Help desks management.
- Employee performance evaluation.
- Loan analysis.
- Virus detection.
- Useful for repair and maintenance projects.
- Warehouse optimization.
- Planning and scheduling.
- The configuration of manufactured objects.
- Financial decision making Knowledge publishing.
- Process monitoring and control.

- Supervise the operation of the plant and controller.
- Stock market trading.
- Airline scheduling & cargo schedules.

1.10 What Is Google Maps?

Google Maps is a web mapping product developed at Google by Lars Rasmussen and Jens Rasmussen. It offers satellite imagery, aerial photography, street maps, 360° interactive panoramic views of streets (Street View), real-time traffic conditions, and route planning for traveling by foot, car, air (in beta) and public transportation. In 2020, Google Maps was used by over 1 billion people every month around the world.

1.11 ADVANTAGES OF GOOGLE MAPS.

- Add stops to your trip.
- Check current and future traffic.
- Orient yourself.
- Navigate through buildings.
- See inside places.
- Catch the last train.
- Xoom one handed.
- Save your favorite locations.
- Create off line maps.
- Check out hiking and skiing trails.
- Avoid paying tolls.

- Remembering where you parked.
- Share your location.
- Organize a group activity.
- Your voice navigation through your vehicle speakers.
- Measure the distance between two points on a map. (And how long it should take.)
- Check out your business or any other bussiness for contact info. I use mine as a phone book. But so very much better.

1.12 Project Plan.

Activity	Team	Start Date	End Date	Duration
Plan Phase				
System Request	Project Team	1/12/2020	4/12/2020	3 Days
Feasibility Study	Project Team	4/12/2020	8/12/2020	4 Days
Project Methodology	Project Team	8/12/2020	10/12/2020	2 Days
Work Plan	Project Team	10/12/2020	11/12/2020	1 Days
Work Breakdown Structure <WBS/>	Project Team	11/12/2020	14/12/2020	3 Days
				13 Days
Analysis Phase				
Requirement Determinations	Project Team	18/12/2020	22/12/2020	4 Days
Use Case Diagram	Project Team	22/12/2020	10/1/2021	19 Days
Use Case Tables	Project Team	10/1/2021	10/2/2021	31 Days
Context Diagram	Project Team	10/2/2021	16/2/2021	5 Days
Data Flow Diagrams	Project Team	16/2/2021	21/2/2021	5 Days
Design Entity Relationship Diagram <ERD/>	Project Team	21/2/2021	27/2/2021	6 Days
Mapping of ERD	Project Team	27/2/2021	1/3/2021	2 Days
				75 Days
Design Phase				
Architecture Design	Project Team	4/3/2021	7/3/2021	3 Days
Software & Hardware Specifications	Project Team	7/3/2021	10/3/2021	3 Days
Database Design	Project Team	10/3/2021	13/3/2021	3 Days
User Interfaces	Project Team	13/3/2021	23/3/2021	10 Days
Flow Chart of Diagnose	Project Team	23/3/2021	31/3/2021	8 Days
				27 Days
Programming Phase				
Develop Home Interface	Project Team	3/4/2021	18/4/2021	15 Days
Develop Map Interface	Project Team	18/4/2021	2/5/2021	15 Days
Develop Diagnostic Interfaces	Project Team	2/5/2021	**17/5/2021**	15 Days
				45 Days
160 Days <> +5 Months working on project.				

Table 1 PROJECT PLAN

CHAPTER TWO

SYSTEM DEVELOPMENT & WORK PLAN

2. Chapter Two: Plan Phase.

2.1 Plan Phase

The planning phase is the fundamental process of understanding Why an information system should be built and determining how the project team will go about building it.

2.2 System Request.

2.2.1 Project Sponsor:

- This project has no funding source.

2.2.2 Business Needs & Reasons:

- Spread of the corona virus.
- Increase the number of people infected with Coronavirus.
- Increase the number of deaths from the Corona virus.
- Patient suffering to get to the hospital.
- Difficulty of finding a closest hospital and their address.

2.2.3 Business Requirements:

- Provide a website.
- Provide online access.
- Includes medical advice.

- contains a map of hospitals to get closest & available hospital.
- Includes diagnosing the patient with expert system.

2.2.4 Business Value:

- 90% limiting the spread of the virus.
- 80% Reducing the number of people infected with the Corona virus.
- 80% Reducing the number of deaths from the Corona virus.
- 95% Reducing patient suffering to get to the hospital.

2.2.5 Special Issues:

- Deadline in the end of academic year.
- Top-level security with data.
- Providing means of comfort of patient that make the disease not worse.

2.3 Feasibility Study.

- Identifies the important risks associated with the project that must be managed if the project is approved.

2.3.1 Technical Feasibility.

- Is the project possible with current technology?

  Yes, it is possible it needs a mobile or a computer or a laptop and need online access.

- What Technical risk is there?

  1. Patient does not have a device.
  2. Patient does not have online access.

3. The patient cannot determine the pain he faces.
4. Safety hacking and patient privacy.
5. The patient cannot read.

Availability of the technology:

- Is it available locally?

  Yes, it's available the project supports all capabilities which people have.

- Can it be obtained?

  Yes, most people have budget to buy a mobile and most people can be access online.

- will it be compatible with other system?

  It will be compatible with web browser, computer and mobile.

2.3.2 Economic Feasibility.

- Is the project possible, given resource constraints?
- What are the benefits?
  1. Improving health condition.
  2. Easy of patient service.
  3. Saving money of doctor sessions.
  4. Knowing the address of hospital and ease of communication with doctor.
  5. Service speed and ease of use.

6. Reduce risks.

2.3.3 Operational Feasibility.

- If we built it, will they come?

  a. How well the goals of the project accept with the business objectives and strategies?

  The user (patient or doctor) will accept the project procedures, which are represented in several stages:

  1. Users do not face problems registering and logging in because they consist of basic personal information and do not contain private information, and the doctor or patient can use alternative names if they are afraid of security piracy.
  2. The patient does not face a problem because the diagnostic questions do not consist of embarrassing questions nor do we ask them details of private information.
  3. The patient does not face a problem because we do not ask him for things that harm him, affect him, or affect his life.

  b. Who can use the web site?

  1. Patient.
  2. Doctors.

3. Normal people want to know more about the web site and immunize themselves.

2.3.4 Schedule Feasibility,

- The time which the project to be completed is the project will be complete?

  yes, the time ranges from to 7 to 8 months.

- The time which the project tasks schedule can be executed regularly?

  Yes, every task has common time period to be executed and the task is ordered serially (one after the other).

- The time of the phases in the application such as diagnostic phase and treatment phase have enough time to be executed?

  Yes, every phase has a start and end time each phase contains tasks to execute them.

CHAPTER THREE

PROJECT ANALYSIS

3. Chapter Three: Analysis Phase.

3.1 Analysis Phase.

The analysis phase is so named because the term analysis refers to breaking a whole into its parts with the intent of understanding the parts' nature, function, and interrelationships. the work performed in the analysis phase involves expanding the vision described in the system request into a through, detailed understanding of exactly what the new system needs to do. As the detailed understanding of what the new system must do evolves, those detail will be expressed and documented in several ways, including a detailed requirement definition statement, use cases, process model, and data model (All in this chapter).

3.2 Requirements Determination.

3.2.1 Function Requirements.

There are a lot of **software requirements specifications** included in the functional requirements of the **Al-Sharkia COVID-19 Interactive Map & Advisory Website,** which contains various process, namely Registration, Check out, Report Generation, and Database.

3.2.1.1 Process Oriented.

1. Register as a guest.
2. Fill his personal information.
3. If he is already registered, he should login.
4. Enter his username and password.
5. Go to page home.
6. Diagnose the disease.
7. Receive a report about his disease.
8. Treatment phase after diagnose phase.
9. Determine the nearest hospital location for the patient.
10. Can log out.

3.2.1.2 Information Oriented.

1. Personal information of patient.
2. Patient addresses.
3. Questions of diagnosis phase.
4. Report about his disease.
5. Subjects about diseases.
6. Closest Hospital location.

3.2.2 Non-Functional Requirements.

There are a lot of **software requirements specifications** included in the non-functional requirements of the **Al-Sharkia COVID-19**

Interactive Map & Advisory Website, which contains various process, namely **Security**, **Performance**, **Maintainability**, and **Reliability**.

3.2.2.1 Operational.

- The application can run on handled devices.
- The Application will be agreed with all existing systems.

3.2.2.2 Performance.

- Any Interactions between user and application shouldn't exceed 2 seconds.
- The application can be downloaded within 5 minutes.
- The application will be available for use 24hours per day and 365 day in year.
- The application will be easy to use.
- The application will have online processes.
- The application can contain an infinite number of users.

3.2.2.3 Security.

- The patient can register as a guest and can enter another name instead of his real name.
- Every user will have password when he login.
- Patient Identification: The system needs the patient to recognize herself or himself using the phone.
- Login ID: Any users who make use of the system need to hold a Logon ID and password.

- Modifications: Any modifications like insert, delete, update, etc. for the database can be synchronized quickly and executed only by the ward administrator.
- Front Desk Staff Rights: The staff in the front desk can view any data in the Hospital Management system, add new patients record to the HMS but they don't have any rights alter any data in it.

Cultural.

- The application will provide subjects about diseases.
- The application will provide hospital location.
- The application will provide information about the hospital.
- The application will provide a diagnosis of the patient's condition.

Maintainability

- Back-Up: The system offers the efficiency for data back up.
- Errors: The system will track every mistake as well as keep a log of it.

Reliability.

Availability:

- The system is available all the time.

3.3 Use Case.

Use case diagrams overview the usage requirements for a system. It has three main components: 1) Use Case describes a sequence of action that provide something of measurable value to an actor and is drawn as a horizontal ellipse, 2) Actors: is a person, organization, or external system interact with your system. 3) Association: association between actors and use cases are indicated in use case diagram by solid lines. An association exists whenever an actor is involved with an interaction described by a use case. our system has a lot of use cases and two actors: User & Admin.

3.3.1 Use Case Diagram.

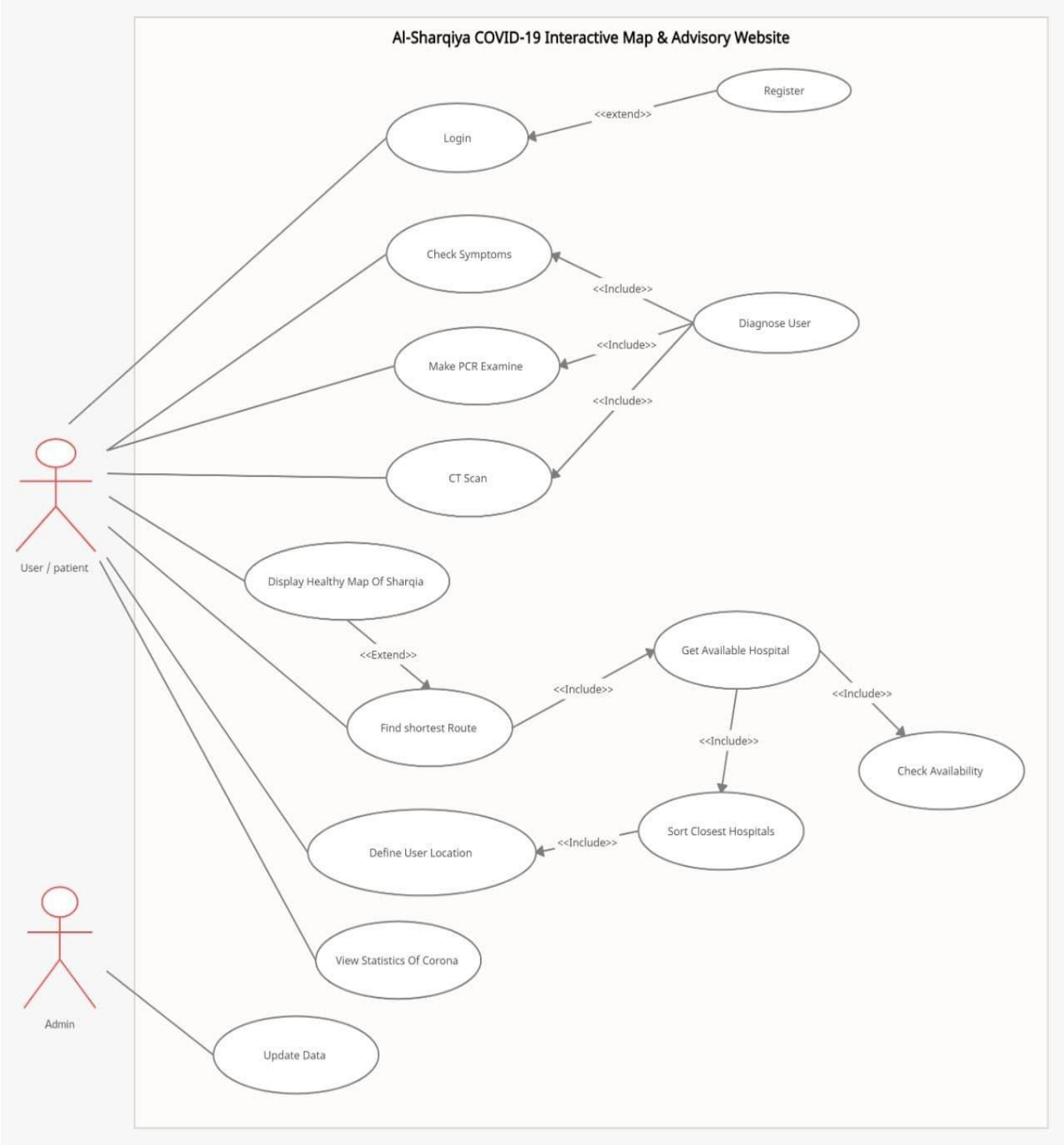


Figure 3 Use Case Diagram

3.4 Narrative Tables of Use Case.

Use case narration is a textual representation of the course of events encountered when an actor is interacting with the system. There can be several use cases associated with a system, each of which describes the system in a functional or behavioral point of view.

3.4.1 Log In.

Use Case Name: Log In	**ID:** 1	**Priority:** High
Actor: User/Patient		
Description: The use case describes the user / patient Log In to the system "Al-Sharkia Health Care".		
Trigger: When user or patient need to use the services of our system such as 'Diagnose Service' or 'Map Service'. **Type:** External.		
Preconditions: 1. Online Access. 2. Have an account on system means registered previously.		
Normal Course: 1. Access the website. 2. Enter useremail. 3. Enter userpassword. 4. Click 'Sign In' button to execute the log in process. 5. Check validation of user. 6. Check authentication of user.	**Information for Steps:** 1. Domain Name. 2. Personal information.	
Post Conditions: 1. Patient should be redirected to the home page. 2. Services will be available of new register to use. 3. Logout should be available.		
Exceptions: 1. Offline, there is need to connect the internet. 2. Validation does not match so user need to match the validations standards. 3. There is no account with this email, so user need to register and get an account. 4. The password is not correct.		

Summary Inputs:	**Source:**	**Outputs:**	**Destination:**
1. User email. 2. User password	1. Account owner.	1. Personal Account.	1. Database.

Table 2 Login Use Case

3.4.2 Register Use Case.

Use Case Name: Sign Up / Register	**ID:** 2	**Priority:** High
Actor: User/Patient		
Description: When Sign user make Up he can start using the available services of system.		
Trigger: When user or patient need to use the services of our system such as 'Diagnose Service' or 'Map Service'. **Type:** External.		
Preconditions: 1. Online Access. 2. Register as guest.		
Normal Course: 1. Click on 'Sign Up' button. 2. Enter his personal information. 3. Click on 'Confirm' button	**Information for Steps:** 1. Name. 2. Email. 3. password. 4. Confirm password.	
Post Conditions: 1. Patient should be redirected to the log In page.		
Exceptions: 1. Offline, there is need to connect the internet. 2. Validation does not match so user need to match the validations standards. 3. There is already account with this email, so user need to log In.		

Summary Inputs:	**Source:**	**Outputs:**	**Destination:**
1. Entered information of user for registration.	1. patient.	1. Account Data.	1. Database.

Table 3 Register Use Case

3.4.3 Diagnose Use Case.

Use Case Name: Diagnose.	**ID:** 3	**Priority:** High
Actor: User/Patient		
Description: use case is used for diagnosing the patient, treatment and select medicines, where the user of system can define if he has covid-19 or not?.		
Trigger: When patient need to use the 'diagnose service' of our system. **Type:** External.		
Preconditions: 1. Online Access. 2. Have an account on system means registered previously. 3. When he doubts that he has symptoms of Corona virus.		
Normal Course: 1. Display the questions of diagnose. 2. User answer the diagnose questions. 3. User navigates between other questions forms. 4. Report to know the case of patient.	**Information for Steps:** 1. Information about symptoms. 2. User Answers. 3. CT Scans, and examinations, and other questions. 4. Specific Report of patient.	
Post Conditions: 1. The patient will know his case if stable or not and if there's treatment or medicines should be taken.		
Exceptions: 1. The patient makes incorrect answers in diagnosing his case, therefore will take a wrong treatment.		

Summary Inputs:	**Source:**	**Outputs:**	**Destination:**
1. Different Questions	1. System.	1. Answered Questions. 2. Report about case of patient.	1. Patient. 2. System.

Table 4 Diagnose Use Case

3.4.4 Shortest Route.

Use Case Name: Shortest Route.	**ID:** 4	**Priority:** High
Actor: User/Patient		
Description: use case is used to reach the nearest and available isolation hospital.		
Trigger: When the patient's case is critical, sever or moderate then patient needs the map service. **Type:** External.		
Preconditions: 1. Online Access. 2. Have an account on system means registered previously. 3. The case of patient is critical, sever, or moderate. 4. Permission of getting the location from patient.		
Normal Course: 1. Define the location of patient. ← 2. Check availability of hospitals. ← 3. Sort closest hospitals.	**Information for Steps:** 1. Current coordinates of patient. 2. Data of hospitals from database.	
Post Conditions: 1. The patient will know the closest and available hospitals to him.		
Exceptions: 1. The data of hospitals is not correct.		

Summary Inputs:	**Source:**	**Outputs:**	**Destination:**
1. Current location of patient. 2. Hospital's Data from database.	1. Patient. 2. System.	1. Shortest and Available Hospitals List.	1. Patient.

Table 5 Shortest Route Use Case

3.5 DATA FLOW DIAGRAM.

A data flow diagram (DFD) illustrates how data is processed by a system in terms of inputs and outputs. As its name indicates its Focus is on the flow of information, where data comes from, where It goes and how it gets stored.

- **Elements of Data Flow Diagram.**

1. Process: A process is an activity or a function that is performed for some specific business reason.

2. Data Flow: A data flow is a single piece of data (sometimes called data element), or a logical collection of several pieces of information.

3. Data Store: A data store is a collection of data that is stored in some way.

4. External entity: An external entity is a person, organization, Organization unit, or system that is external to the system, but interact with it

3.5.1 CONTEXT DIAGRAM.

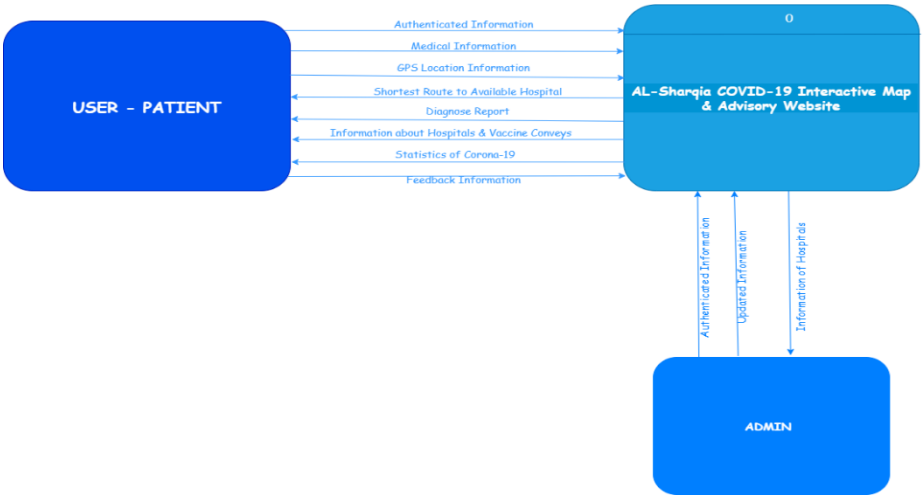


Figure 4 Context Diagram

3.5.2 Data Flow Diagram [Level Zero].

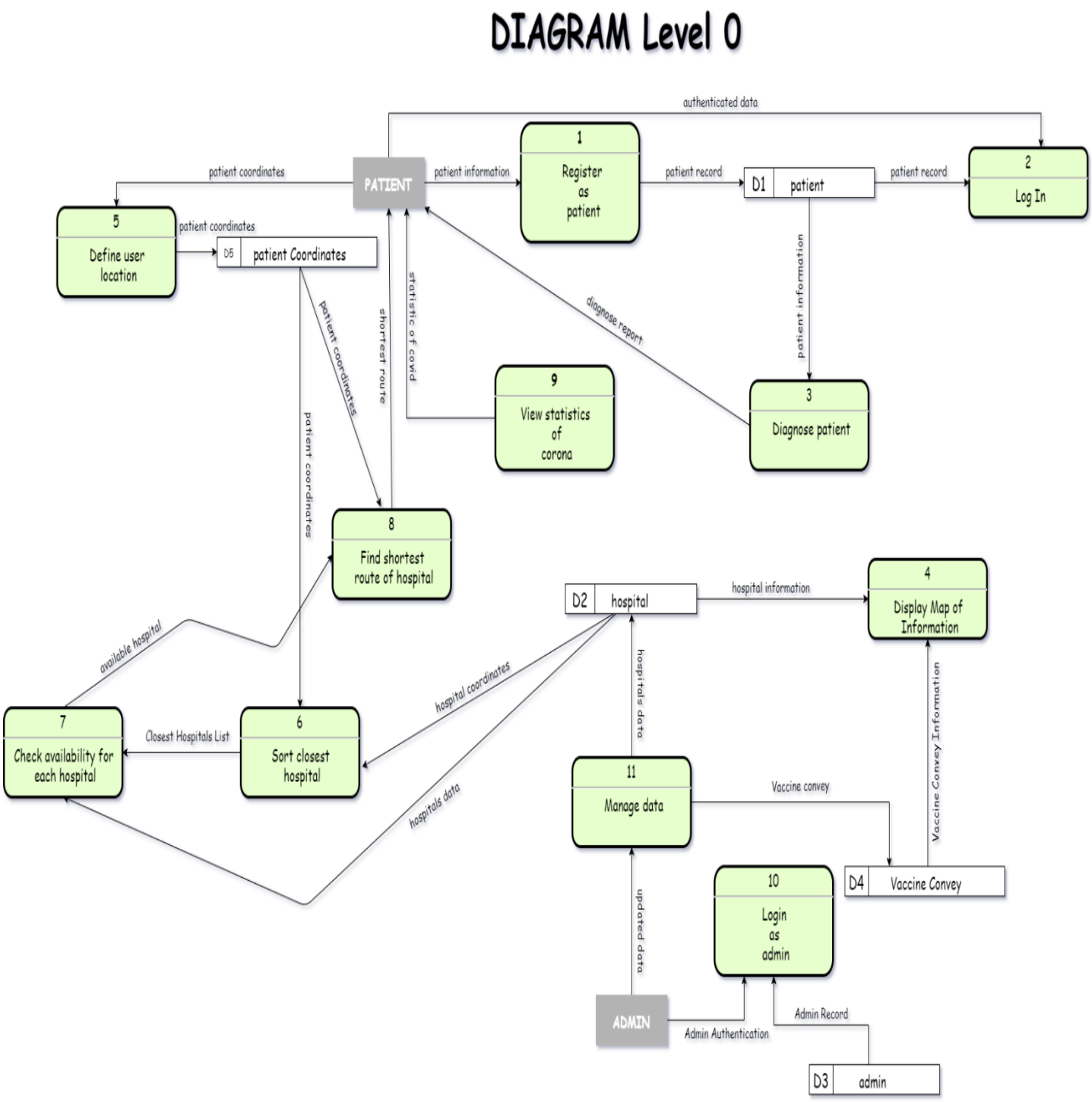
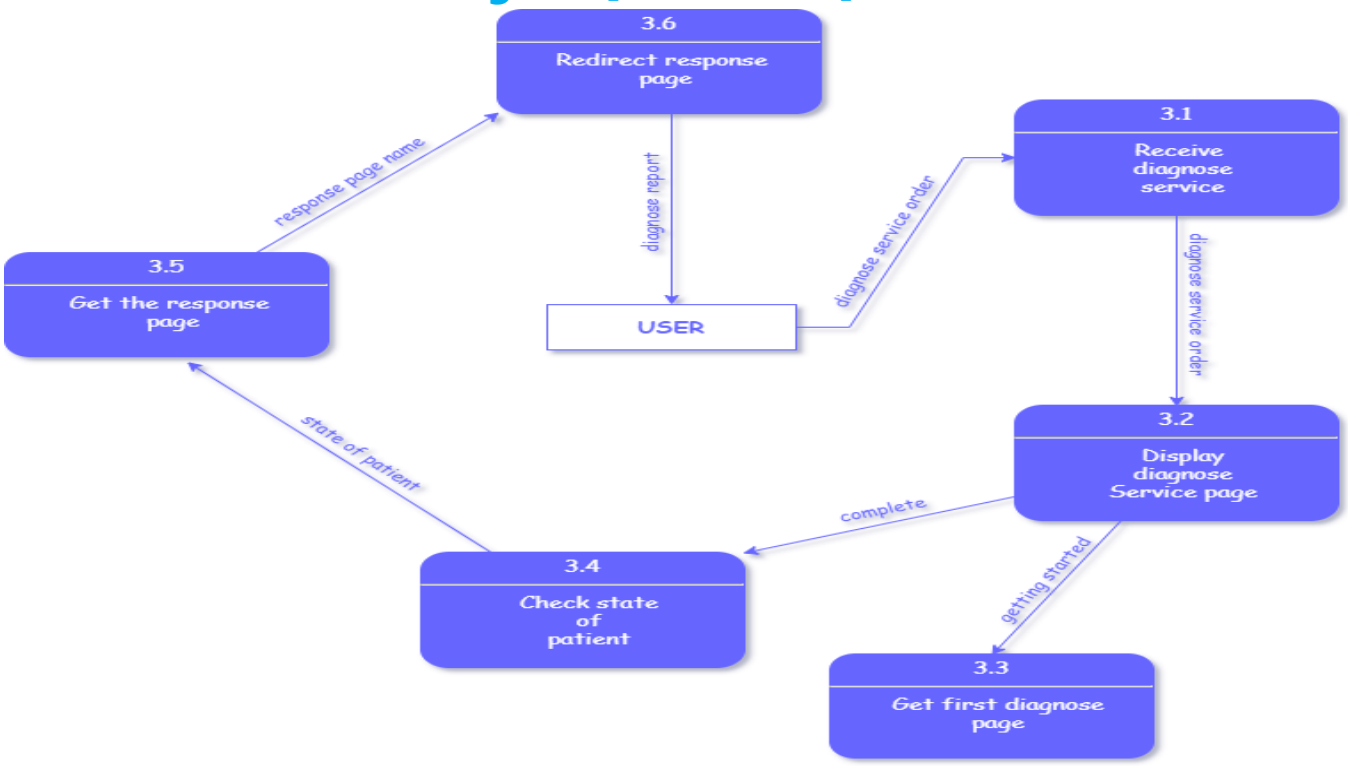
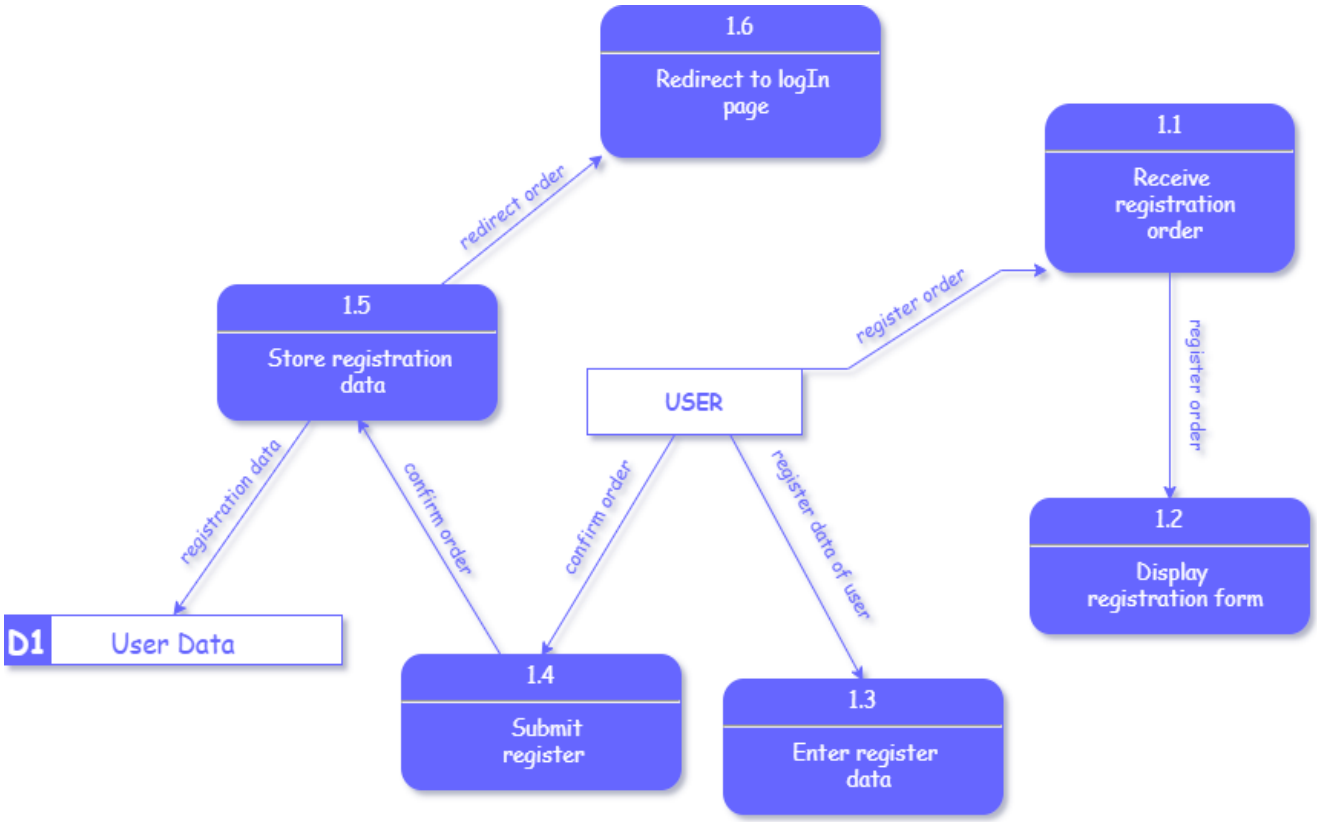
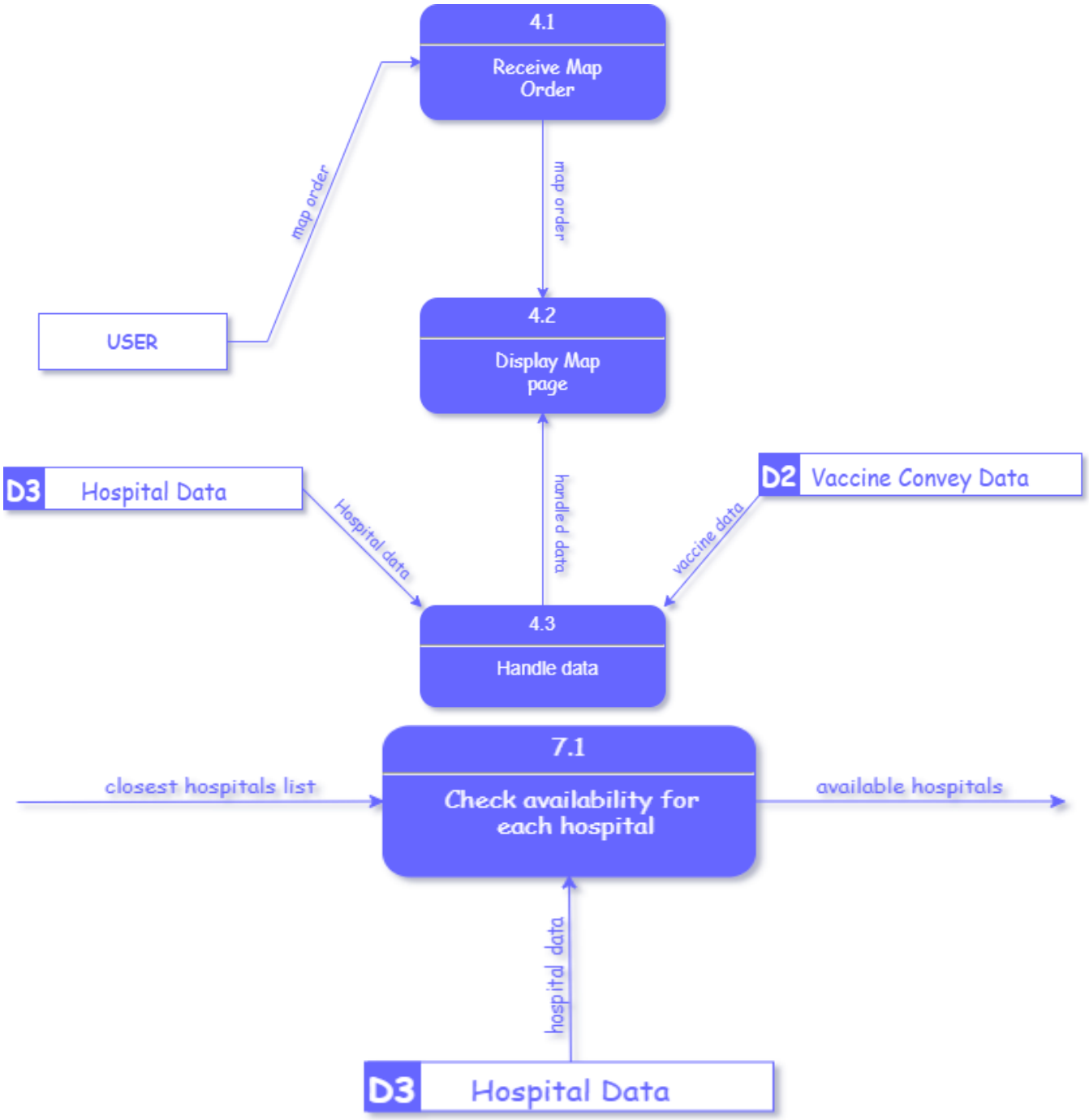


Figure 5 Data flow diagram level 0

3.5.3 Data Flow Diagram [Level One].






4.1
Receive Map Order
map order
map order
USER
4.2
Display Map page
D3
Hospital Data
Hospital data
handled data
vaccine data
D2
Vaccine Convey Data
4.3
Handle data
closest hospitals list
7.1
Check availability for each hospital
available hospitals
hospital data
D3
Hospital Data

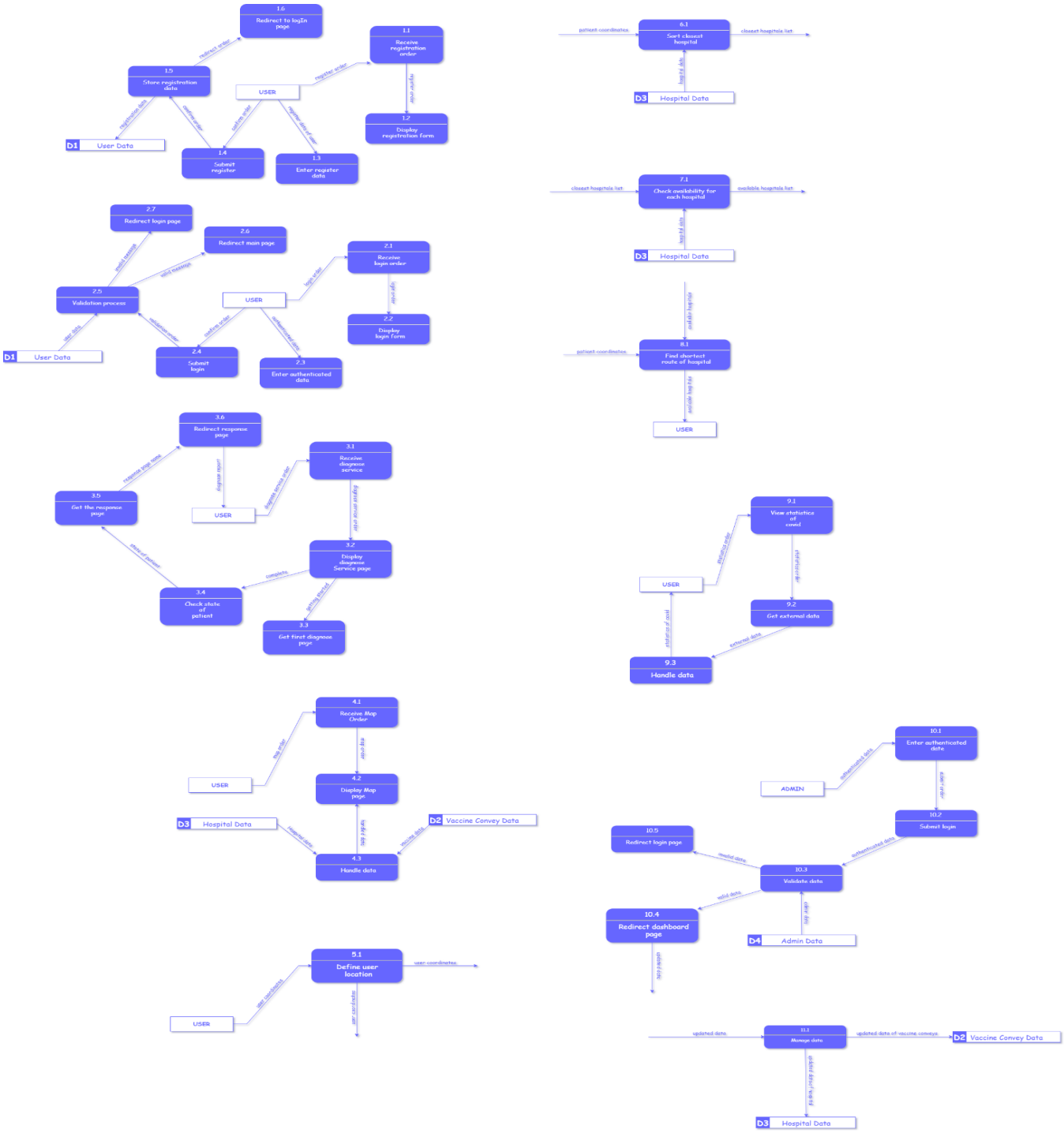


Figure 6 Data flow diagram level 1

3.6 Data Modeling.

3.6.1 Entity Relationship Diagram.

Entity Relationship Diagram, also known as ERD, ER Diagram or ER model, is a type of structural diagram for use in database design. An ERD contains different symbols and connectors that visualize two important information: The major entities within the system scope, and the inter-relationships among these entities.

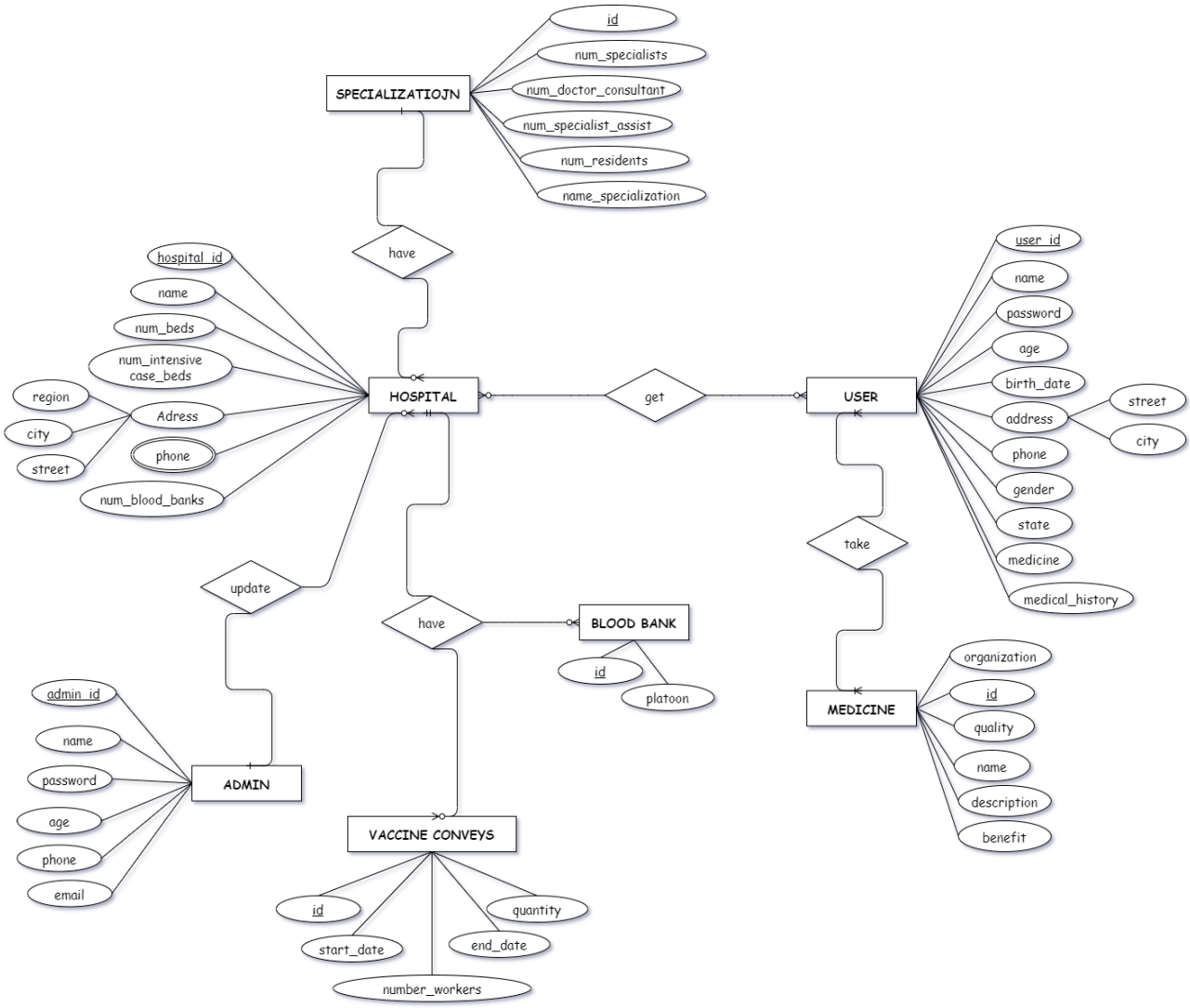


Figure 7 ERD

3.6.2 Mapping.

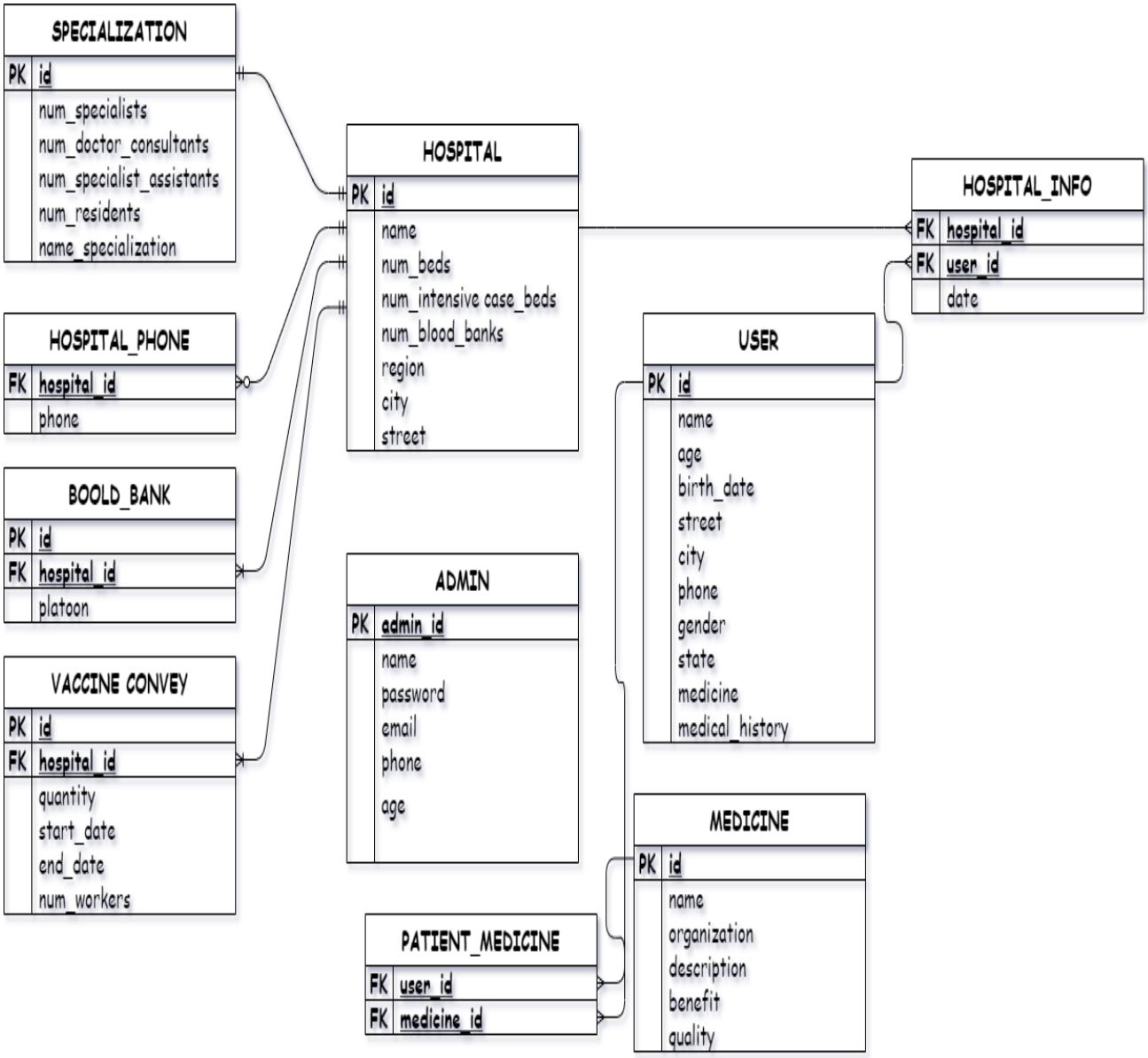


Figure 8 Mapping

3.7 Business Model.

Business Model

Designed for:	Designed by:	Date:	Version:
		5/1/2021	2.0

Key Partners

- Ministry.
- Experts & Doctor.
- Marketing Agency.
- Software Company.

Key Activities

- Diagnose.
- Display information about Hospitals of Sharqia.
- Display Information about Vaccine Conveys of Sharqia.
- Determine Shortest Path.
- Reduce Time & Cost to get available Hospitals.

Key Resources

- **Code** base.
- Information of Ministry.
- Developers.
- Experts & Doctors.
- Content.
- Brand.
- Domain & Hosting.

Value Propositions

- Newness.
- Cost reduction.
- Risk reduction.
- Usability.
- Comforts.
- Diagnose & Treatment.

Customer Relationships

- Online Support & Response to Feedbacks.
- Facebook & Twitter Page.

Channels

- **WWW** : Website.
- **Social** Media.
- **SEO** Search Engine Optimization.
- **Email** Marketing.

Customer Segments

- Subscribers (Patients).
- Advertisers & Marketers.
- Free Users.

Cost Structure

- Cost of Software Company.
- Cost of Marketing Agency.
- Hosting Cost **Iaas**.

Revenue Streams

- Advs.
- Revenue.

Figure 9 Business Model

CHAPTER FOUR

DESIGN AND IMPLEMENTATION PHASE

4. Chapter four: Design &Implementation Phase.

4.1 Design Phase.

The design phase of the SDLC uses the requirements that were gathered during analysis to create a blueprint for the future system.

A successful design builds on previous phases and leads to a smooth implementation by creating a clear, accurate plan of what needs to be done. This part includes the initial transition from analysis phase to design phase.

4.2 Specification Document.

The hardware and software specification are a document that describes what hardware and software are needed to support the application. When a specification document is created, <> The hardware needed to support the future system is listed and then described in as much detail as possible. Next, <> The software to run on each hardware component is written down, along with any additional associated costs,

such as technical training, maintenance, extended warranties, and licensing agreements. >> The project team will work in conjunction with the purchasing department to acquire the hardware and software.

Our architecture group and the project team decided that the components that needed to be acquired for the project were a database server, a Web server, and other more details in additional to Two new client computers for the marketing group who will create the promotional campaigns. They developed a hardware and software specification for these components, prepared an RFP Request for proposal, and worked with the purchasing department to acquire the hardware and software. More Details about Our Project Specification below.

4.2.1 Software Requirement.

The final phase of the lifecycle, which comprises all activities associated with the deployment of the application. these efforts include programming, testing, training and installation of the system in a production setting and transition of ownership of the application from the project team to the performing member.

❖ **Programs:**

- **MySQL Community Server** 8.0.22.
- **Mysql Workbench**: For Database Applications.

- **Adobe Xd**: Designing the Main Web Interfaces. Is A Vector-Based User Experience Design Tool for Web Apps And Mobile Apps, Developed And Published By Adobe Inc?
- **Draw.Io**: You Can Use It As A Flowchart Maker, Network Diagram Software, To Create Uml Online, As An Er Diagram Tool, To Design Database Schema, To Build Bpmn Online, As A Circuit Diagram Maker, And More.
- **Visual Studio Code**: Is A Free Source-Code Editor Made By Microsoft For Windows, Linux And Macos. Features Include Support For Debugging, Syntax Highlighting, Intelligent Code Completion, Snippets, Code Refactoring, And Embedded Git.
- **Mapbox:** Is An American Provider Of Custom Online Maps For Websites And Applications Such As Foursquare, Lonely Planet, Facebook, The Financial Times, The Weather Channel And Snapchat.

❖ Programming Languages:

- **Node.Js** Is An Open-Source, Cross-Platform, Back-End, Javascript Runtime Environment That Executes Javascript Code Outside A Web Browser.
- **Html** Is The Basic Language In Web Programming And Is The Cornerstone Of Web Programming.
- **Css Language**: To Design The Style Of The Website.

- **Sql (Sql):** Standard And Modeled Data Language In Database Organization.
- **Javascript**: Javascript Is A Programming Language Used For Interactive Web Periods – It Works On Your Computer And Does Not Bear The Download From Your Web Site.
- **Bootstrap**: Is A Free And Open-Source Css Framework Directed At Responsive, Mobile-First Front-End Web Development. It Contains Css- And Javascript-Based Design Templates For Typography, Forms, Buttons, Navigation, And Other Interface Components.

4.2.2 Hardware Requirements.

- **Mysql Server 8.0.22**, Requires A Minimum Of 6 Gb Of Available Hard Disk Space.
- **Internet**:Internet Functionality Requires Internet Access (Fees May Apply).
- **Hard Disk**
- **Memory** : Express Editions: 512 Mb All Other Editions: 1 Gb
- **Processor Speed :** X86 Processor: 1.0 Ghz, X64 Processor: 1.4 Ghz
- **Processor Type :**X64 Processor: Amd Opteron, Amd Athlon 64, Intel Xeon With Intel Em64t Support, Intel Pentium Iv With Em64t Support.

4.3 Architectural Design.

In many cases, the technical environment requirements as driven by the business requirements may simply define the application architecture. Creating architecture designs begins with the nonfunctional requirements. Operational requirements specify the operating environment(s) in which the system must perform and how those may change over time (i.e., technical environment, system integration, portability, and maintainability). Performance requirements focus on performance issues such as system speed, capacity, and availability and reliability. Security requirements attempt to protect the information system from disruption and data loss (e.g., system value, access control, encryption and authentication, and virus control). Cultural and political requirements are those that are specific to the countries in which the system will be used (e.g., multilingual, customization, unstated norms, and legal).

Requirements	Server Based	Client Based	Thin Client-Server	Thick Client-Server
Operational Requirements				
System Integration System	✓		✓	✓
Portability Requirements			✓	
Maintainability Requirements	✓		✓	
Performance Requirements				
Speed Requirements			✓	✓
Capacity Requirements			✓	✓

Availability & Reliability Requirements	✓		✓	✓
Security Requirements				
High System Value				
Access Control Requirements	✓			
Encryption/Authentication Requirements			✓	✓
Virus Control Requirements				
Cultural/Political Requirements				
Multilingual Requirements				
Customization Requirements			✓	
Making Unstated Norms Explicit				
Legal Requirements				

Table 6 Architectural

Then Architecture Design of Our Project will be Thin Client-Server Architecture with just One Server Used.

Number of Server: One Server <Data Access Logic + Data Storage + Part2/Application Logic>.

Data Storage: Server-Side.

Data Access Logic: Server-Side.

Application Logic: Part1/Client-Part2/Server.

Presentation Logic: Server-Side.

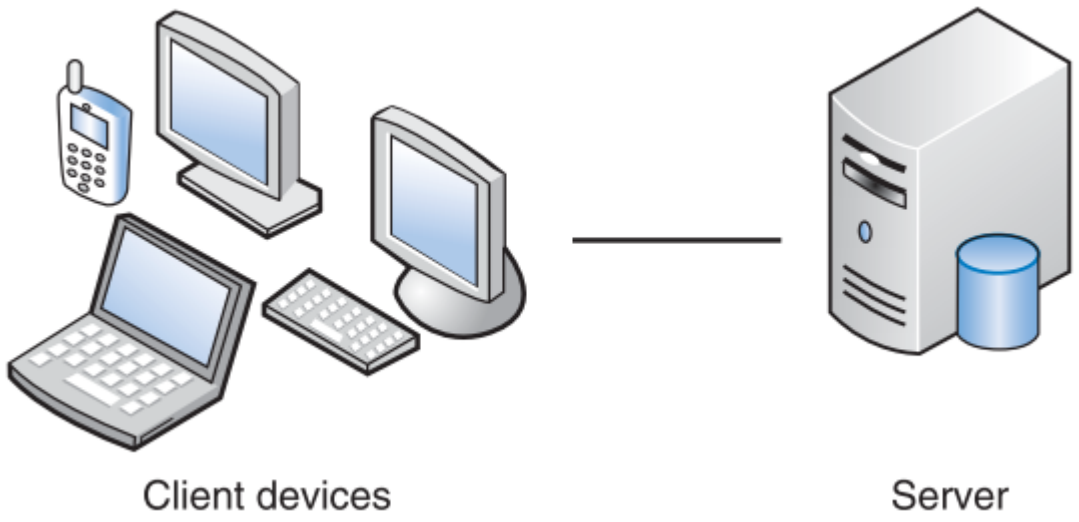


Figure 10 Architectural Design

Handle Presentation Logic	Handle Data Access Logic
Handle Part1 of Application Logic	Handle Data Storage
	Handle Part2/Application Logic

4.4 User Interface Design.

The user interface design defines the way in which the users will interact with the system and the nature of the inputs and outputs that the system accepts and produces. The user interface includes three fundamental parts. The first is the navigation mechanism, the way in which the user gives instructions to the system and tells it what to do (e.g., buttons, menus). The second is the input mechanism, the way in which the system captures information (e.g., forms for adding new customers). The third is the output mechanism, the way in which the system provides information to the user or to other systems (e.g., reports,

Web pages). Each of these is conceptually different, but all are closely intertwined: All computer displays contain navigation mechanisms, and most contain input and output mechanisms. Therefore, navigation design, input design, and output design are tightly coupled.

In many ways, user interface design is an art. The goal is to make the interface pleasing to the eye and simple to use, while minimizing the effort users expend to accomplish their work. The system is never an end in itself, it is merely a means to accomplish the business of the organization.

4.4.1 Sign-In Page.

- The sign-in page used when the user already has an account and need to access the website.
- The user just needs to enter his email & his password, and these fields are required.
- There is an option exists that if the user forgot his password, he could reset his password.
- If he doesn't has an account and need to register in our website, he easily can click the sign-up button in the right side.

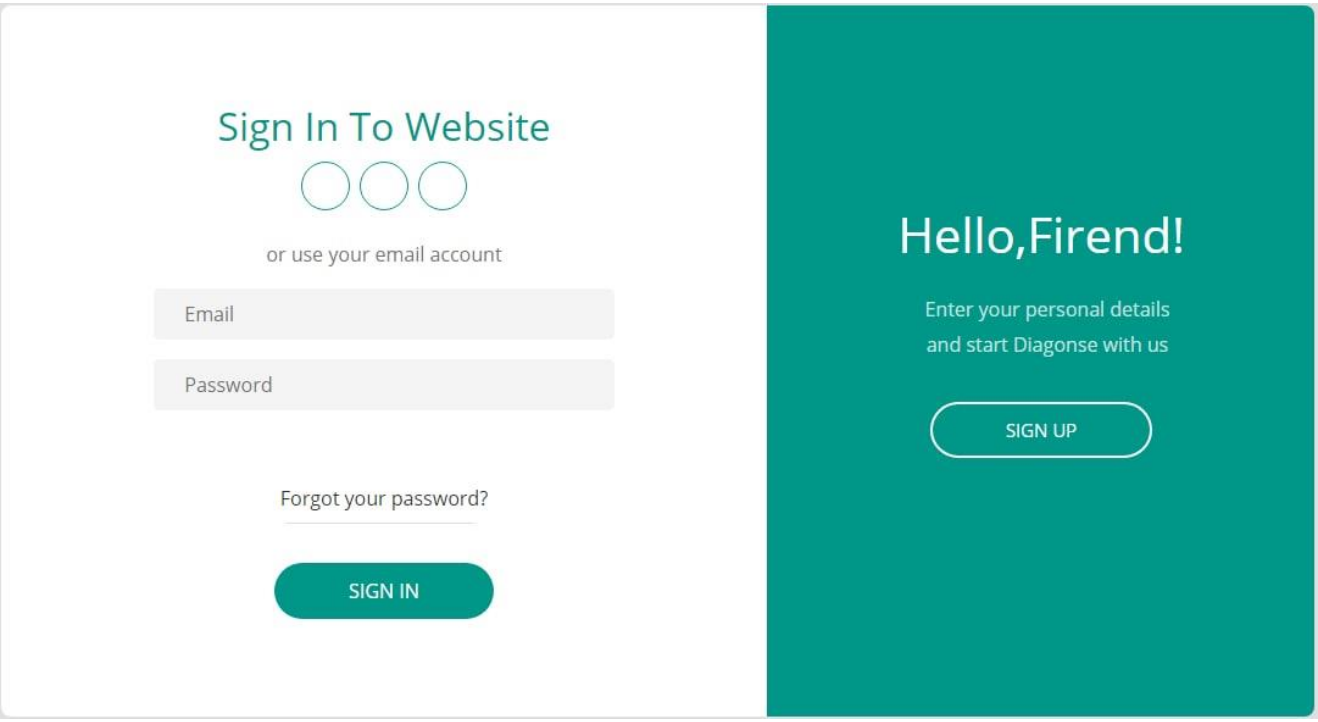


Figure 11 Sign-In Page

4.4.2 Sign-Up Page.

- The sign-up page used when the user does not have an account and need to create on the access our website.
- The user just needs to enter his name, email, password, and confirm his password.
- There is an available option if the user already has an account, he easily can click the sigh-in button in the left side.

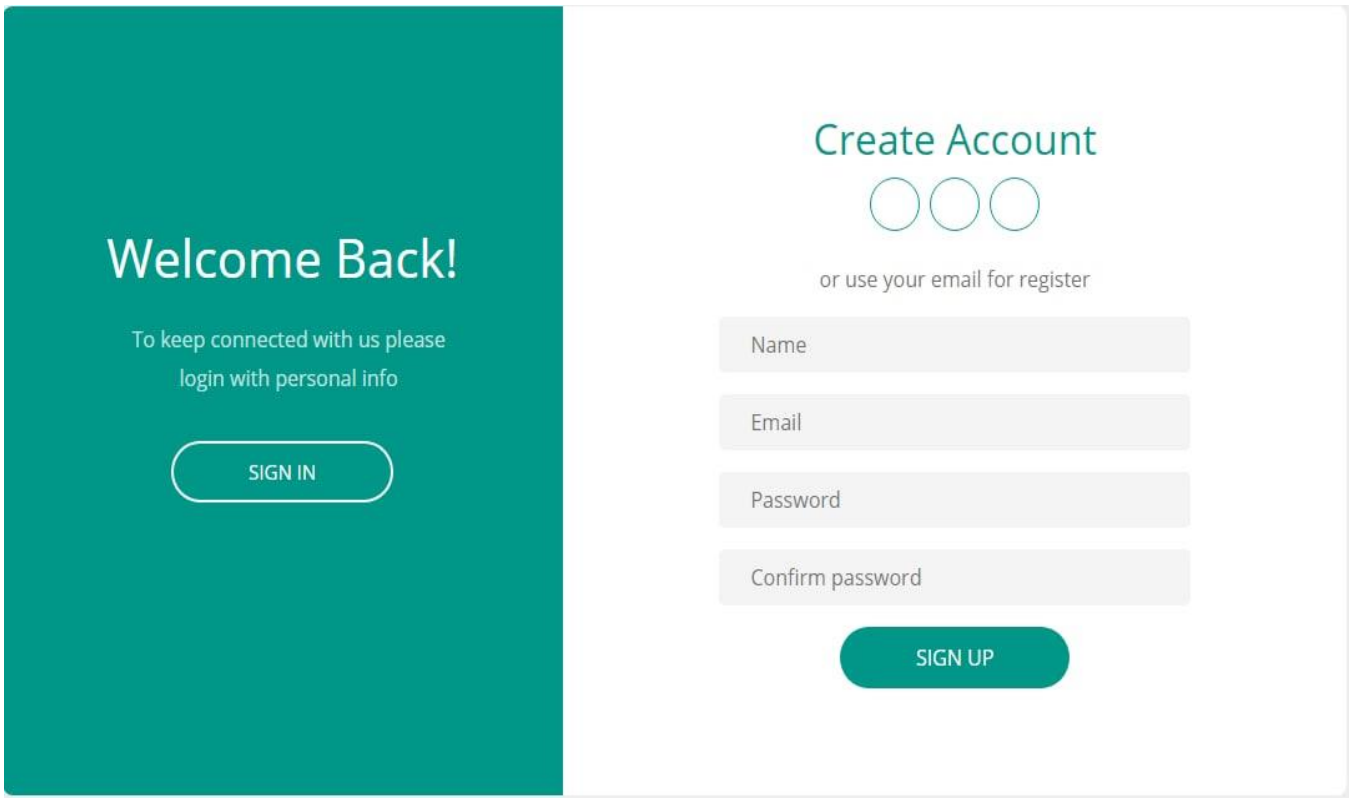


Figure 12 Sign-Up Page

4.4.3 Main Page.

- The main page used as our interface to our users which informs users what is out services.

Figure 13 Main Page

4.4.3.1 Statistics part about covid-19.

- The user can through this part knows what the last updated information about covid-19 in the Egypt is?

Figure 14 Statistics part about covid-19

4.4.3.2 About Covid-19.

- About Covid-19 part display more information about what covid-19 is? and advices through it the user can protect and avoid covid-19.

Figure 15 About Covid-19

4.4.3.3 Our Services.

- Our Services part displays what we introduce in our website? Such as **diagnose service** that considered an expert system examine the patient and report his case what are needed medicines? & **Map service** that shows all available hospitals and vaccine conveys in Al-Sharkia? and what are the closest hospitals available to the patient, & **Vaccine Service** through it the user can reach the ministry location website to reserve an vaccine and know what the last information about covid-19 through the ministry.

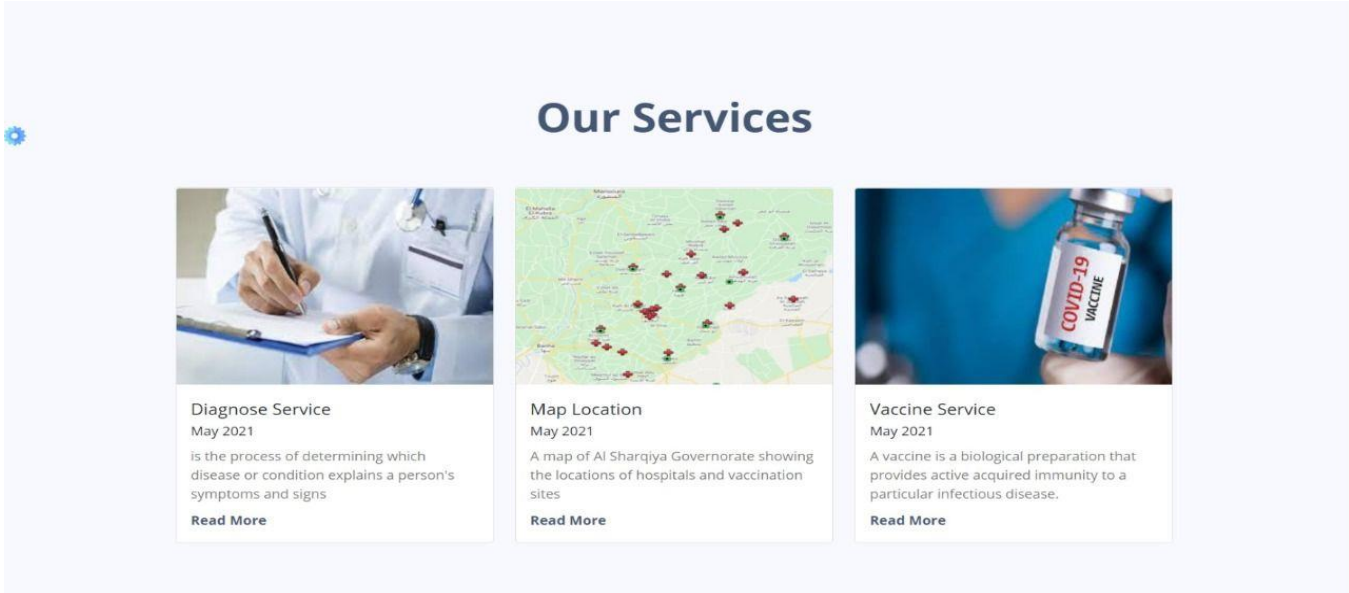


Figure 16 Our Services

4.4.3.4 Symptoms.

- Symptoms part used to inform the user about information about the symptoms of covid-19.

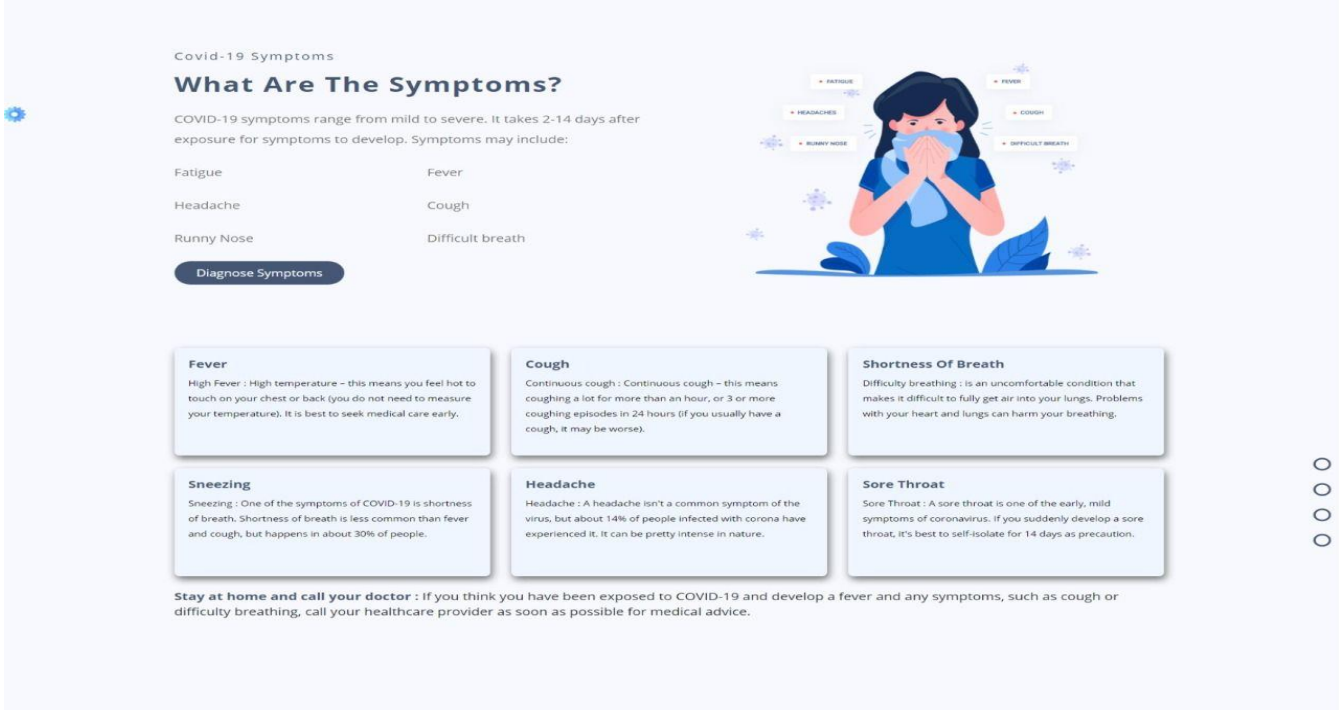


Figure 17 Symptoms

4.4.3.5 Steps of protection.

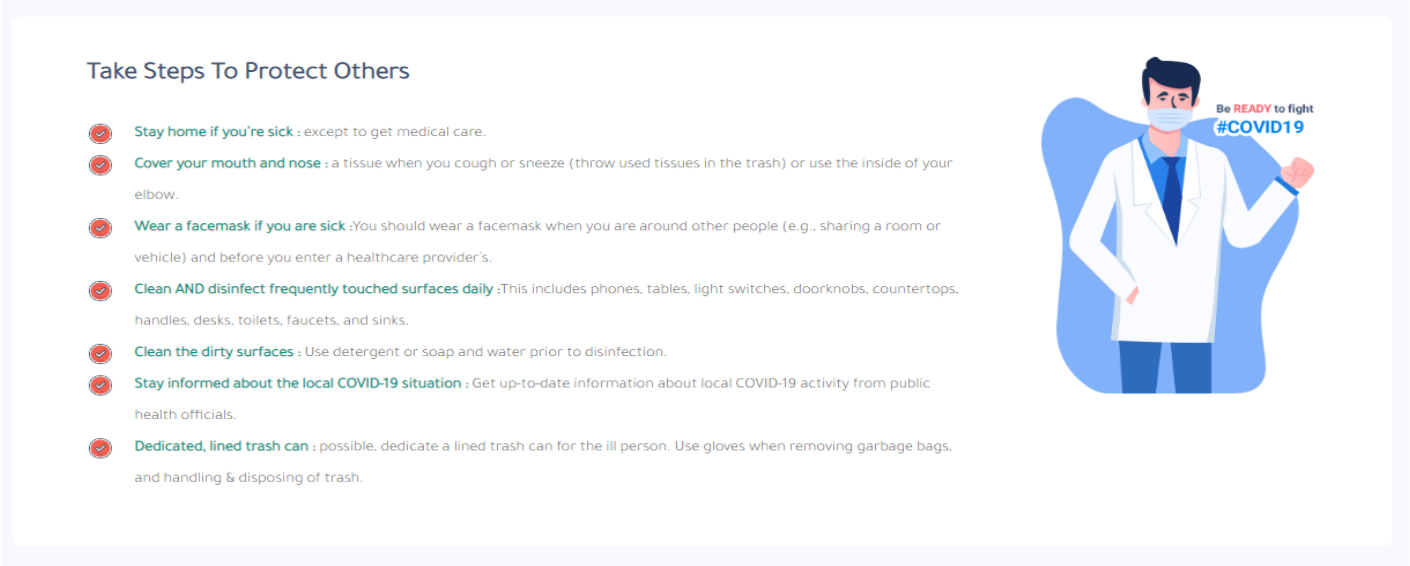


Figure 18 Steps of protection

4.4.3.6 Important Precautions.

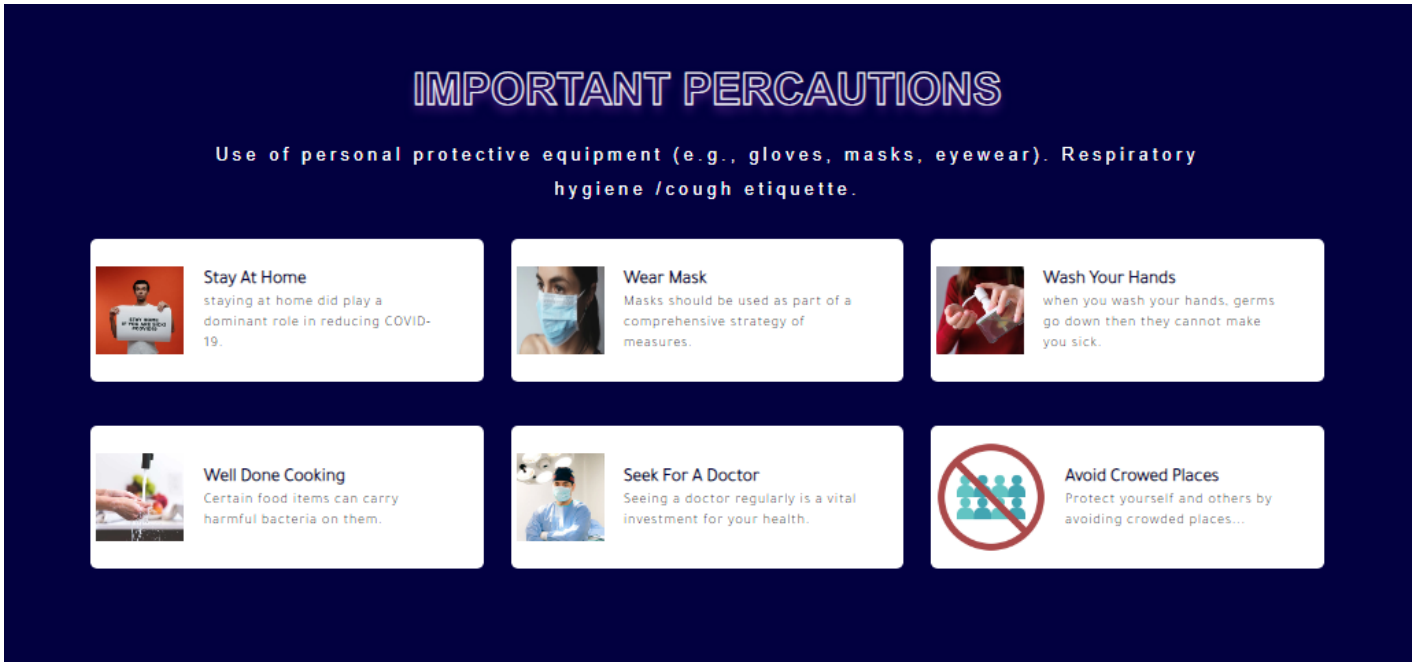


Figure 19 Important Precautions

4.4.3.7 Steps to wash your Hands.

Figure 20 Steps to wash your Hands

4.4.3.8 Last Update News.

Figure 21 Last Update News

4.4.3.9 Subscription Part.

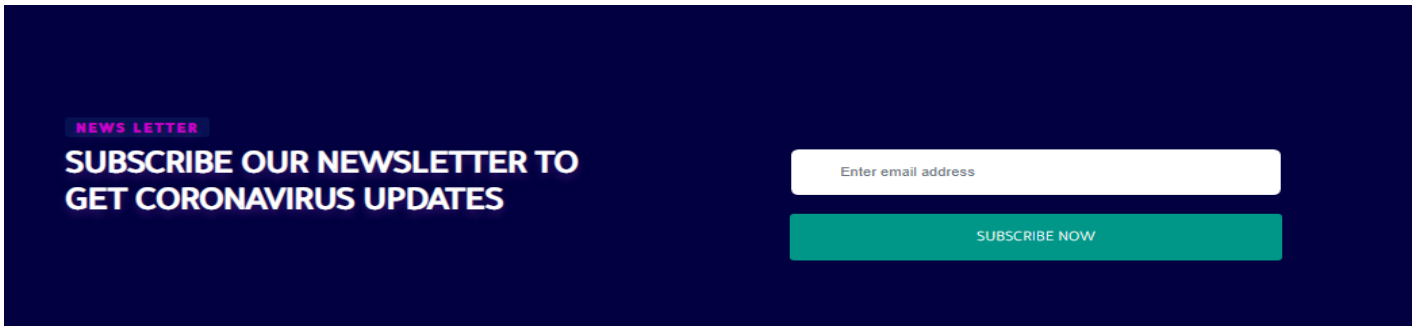


Figure 22 Subscription Part

4.4.3.10 Contact Us Part.

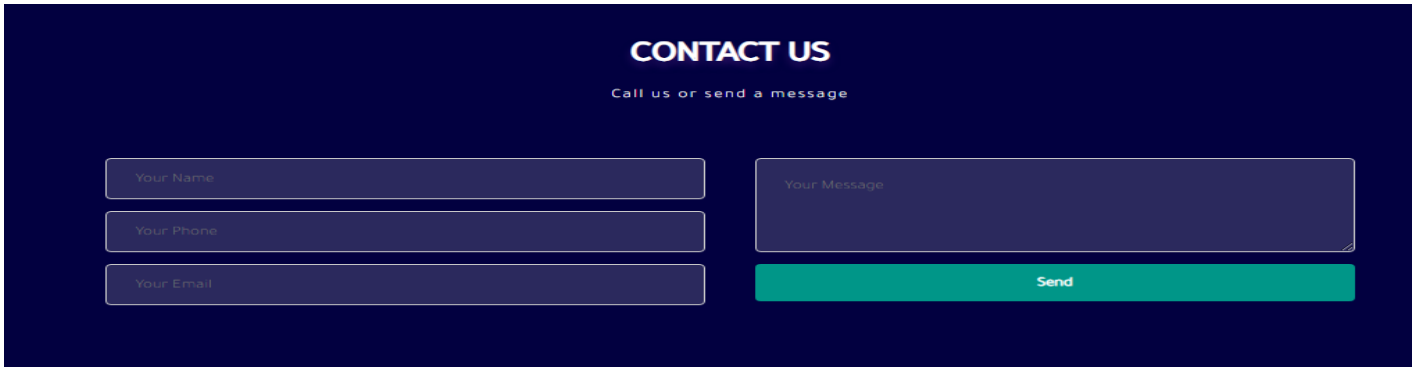


Figure 23 Contact Us Part

4.4.3.11 Footer Part.

Figure 24 Footer Part

4.4.4 Map Service.

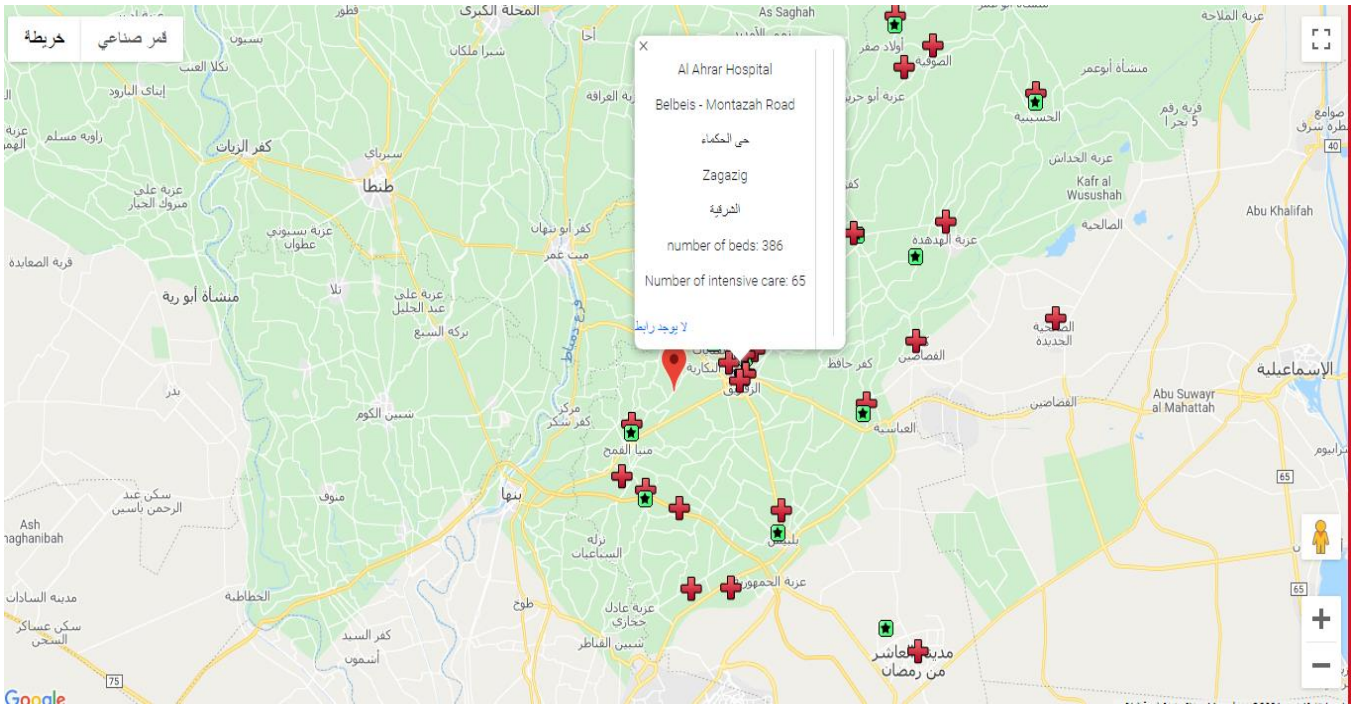


Figure 25 Map Service

4.4.5 The nearest hospital is available.

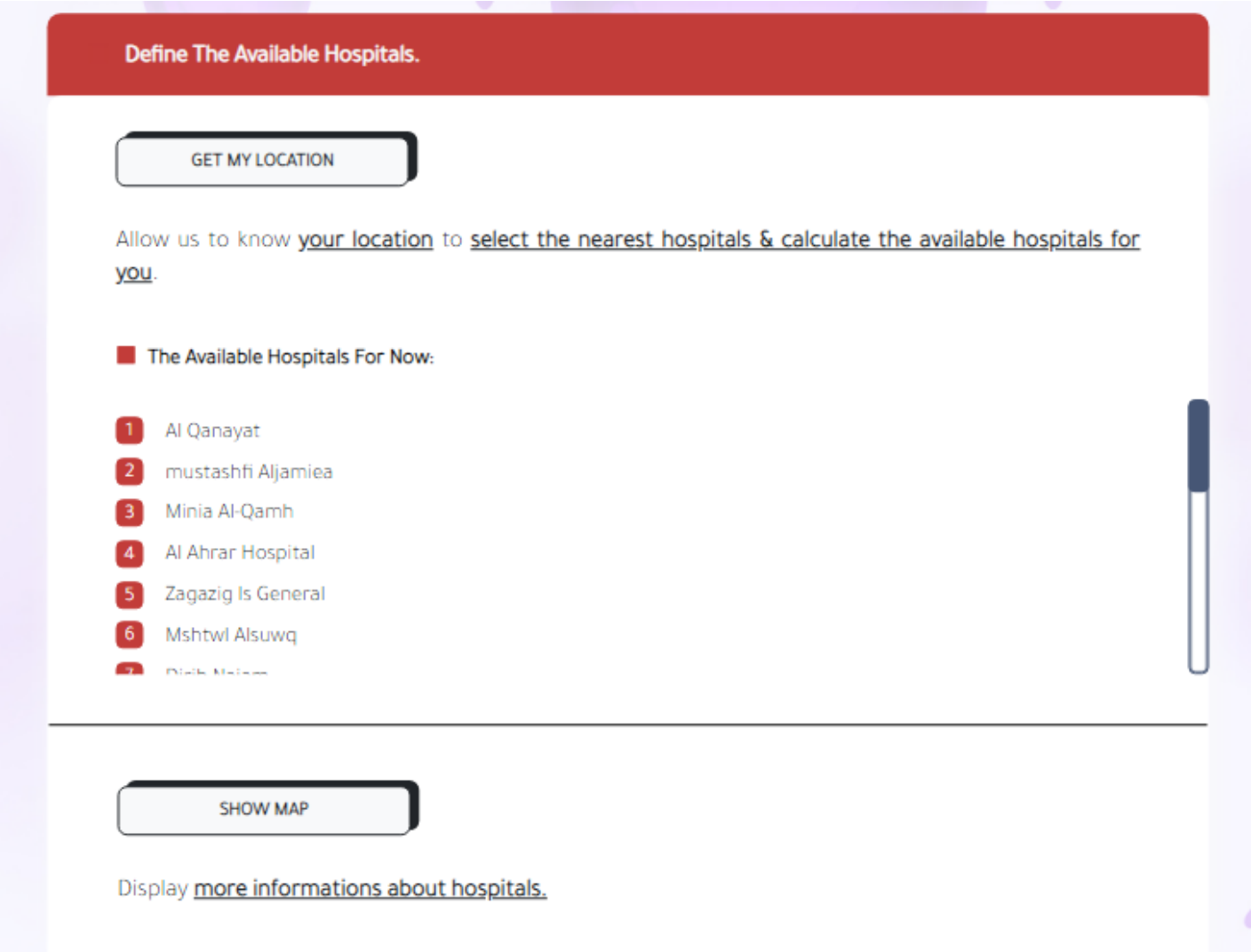


Figure 26 The nearest hospital is available

4.4.6 Available & Nearest 10 Hospitals of Specific Patient.

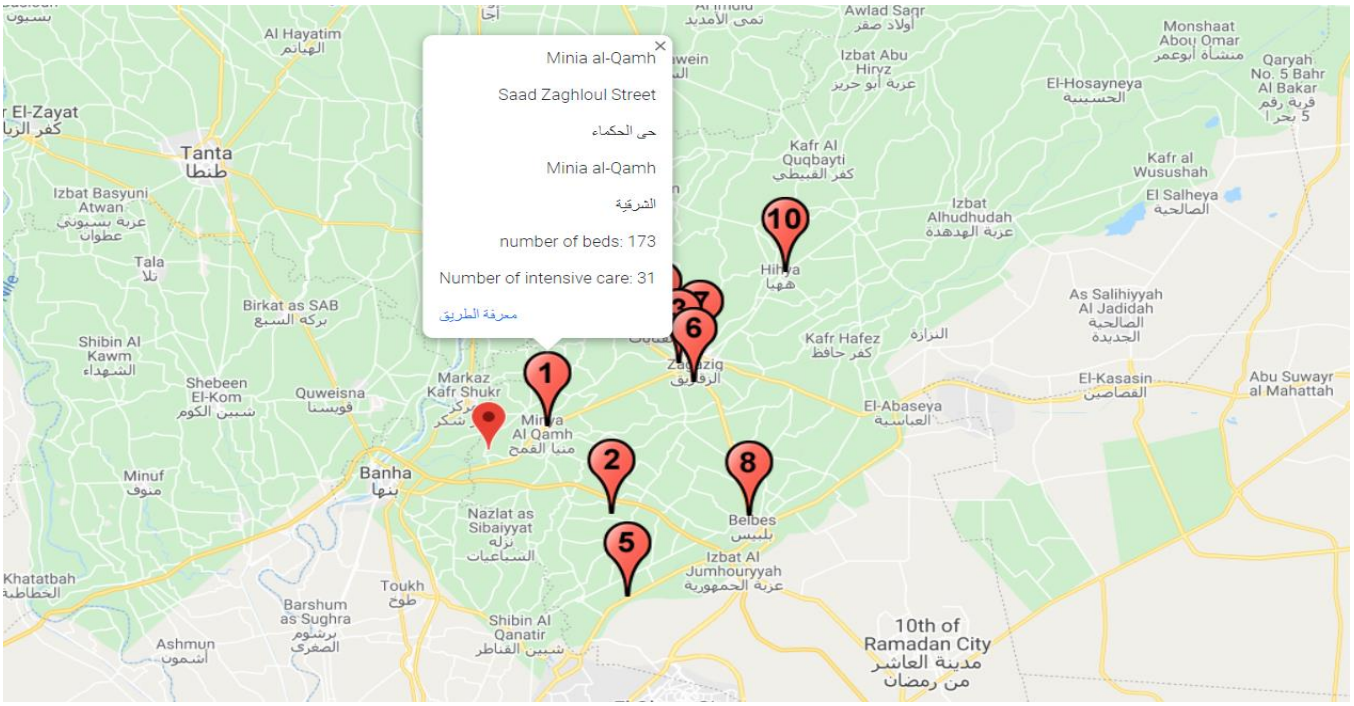


Figure 27 Available & Nearest 10 Hospitals of Specific Patient

4.4.7 Admin LogIn.

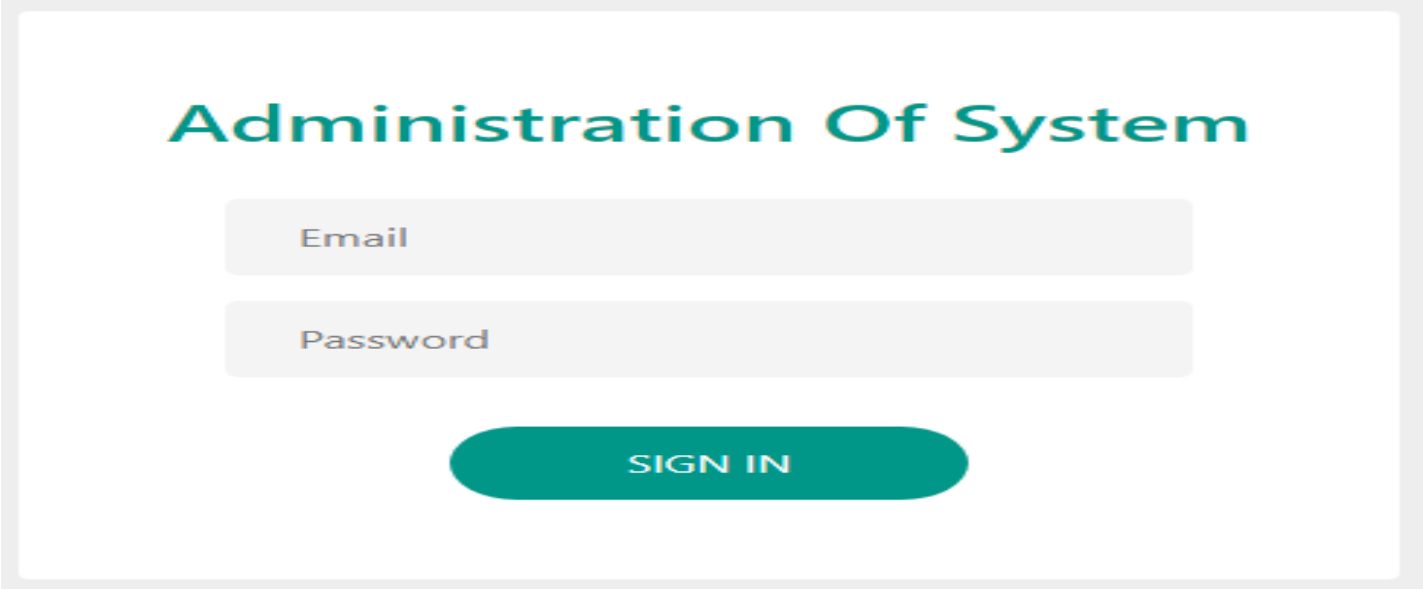


Figure 28 Admin LogIn

4.4.8 ADMIN DASHBOARD.

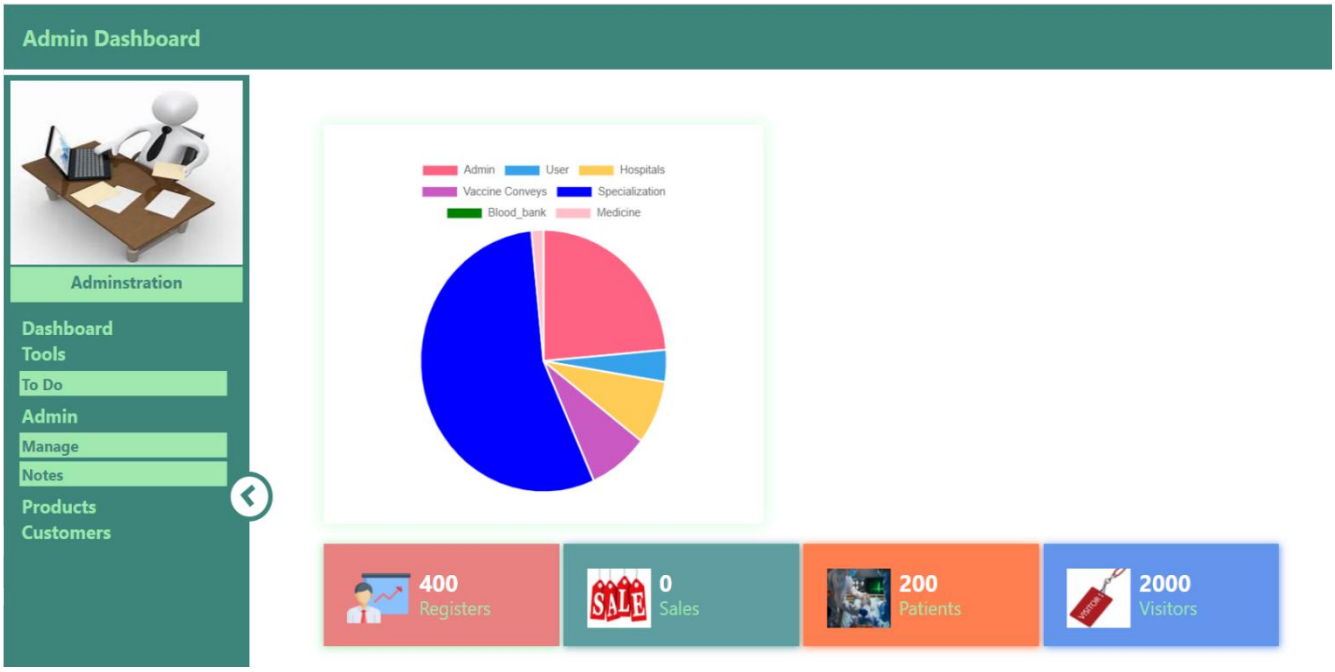


Figure 29 Admin Dashboard

4.4.9 UPDATE ADMIN

Figure 30 Update Admin

4.4.10 Diagnose interface.

This page appears when you click on the diagnostic service. If you are the first time to use the site, press get started. If you are a user of the application, you must click on complete.

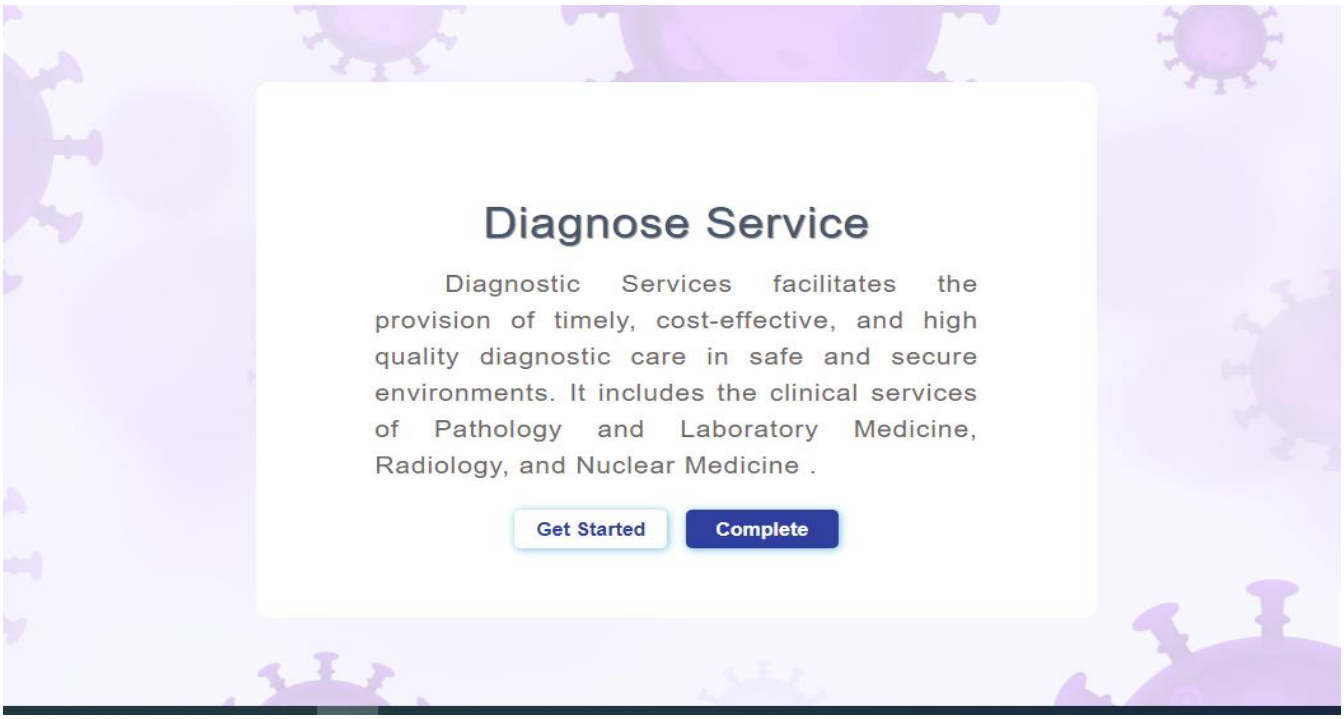


Figure 31 Start Diagnose Interface

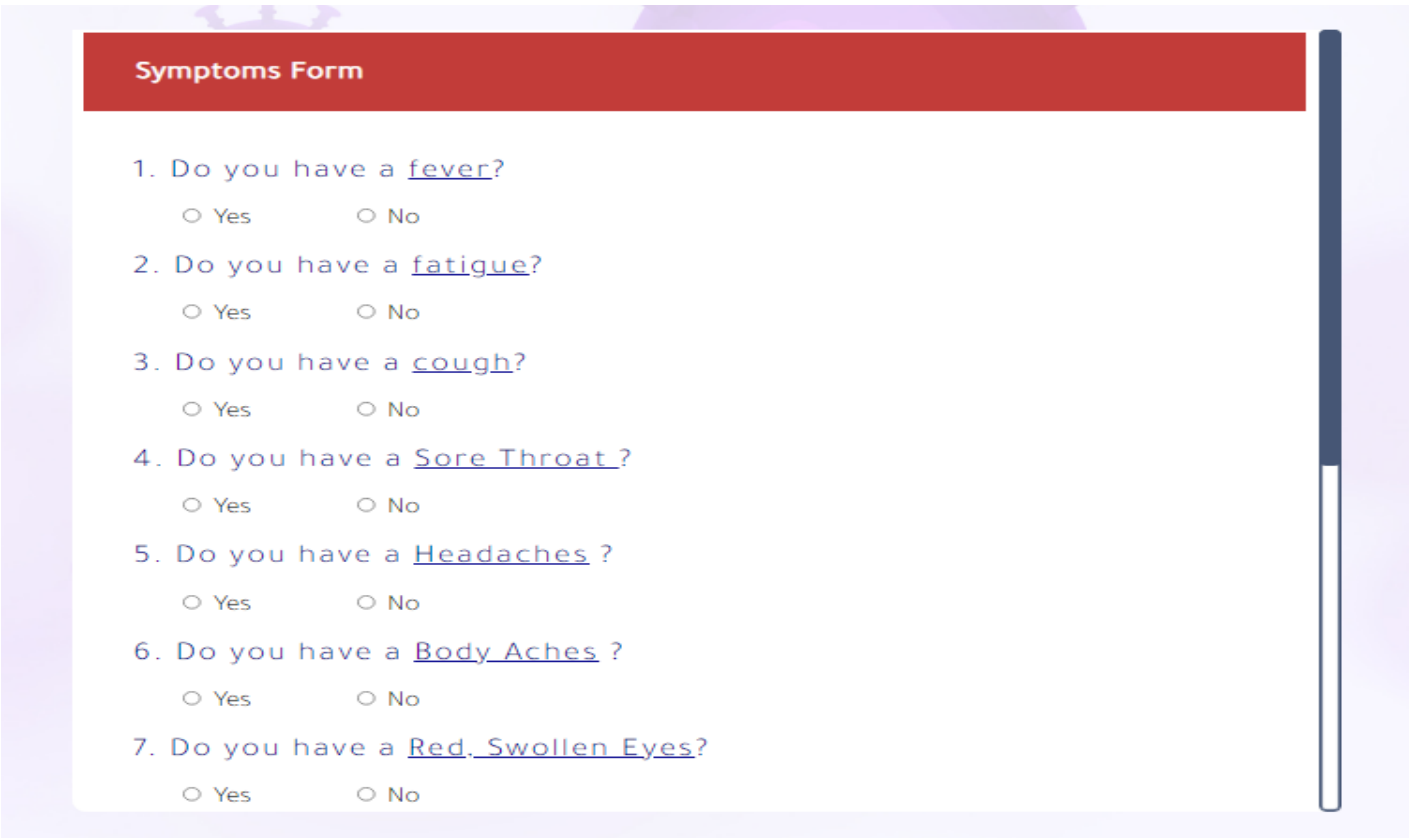


Figure 32 Symptoms Form

Figure 33 Prime Check

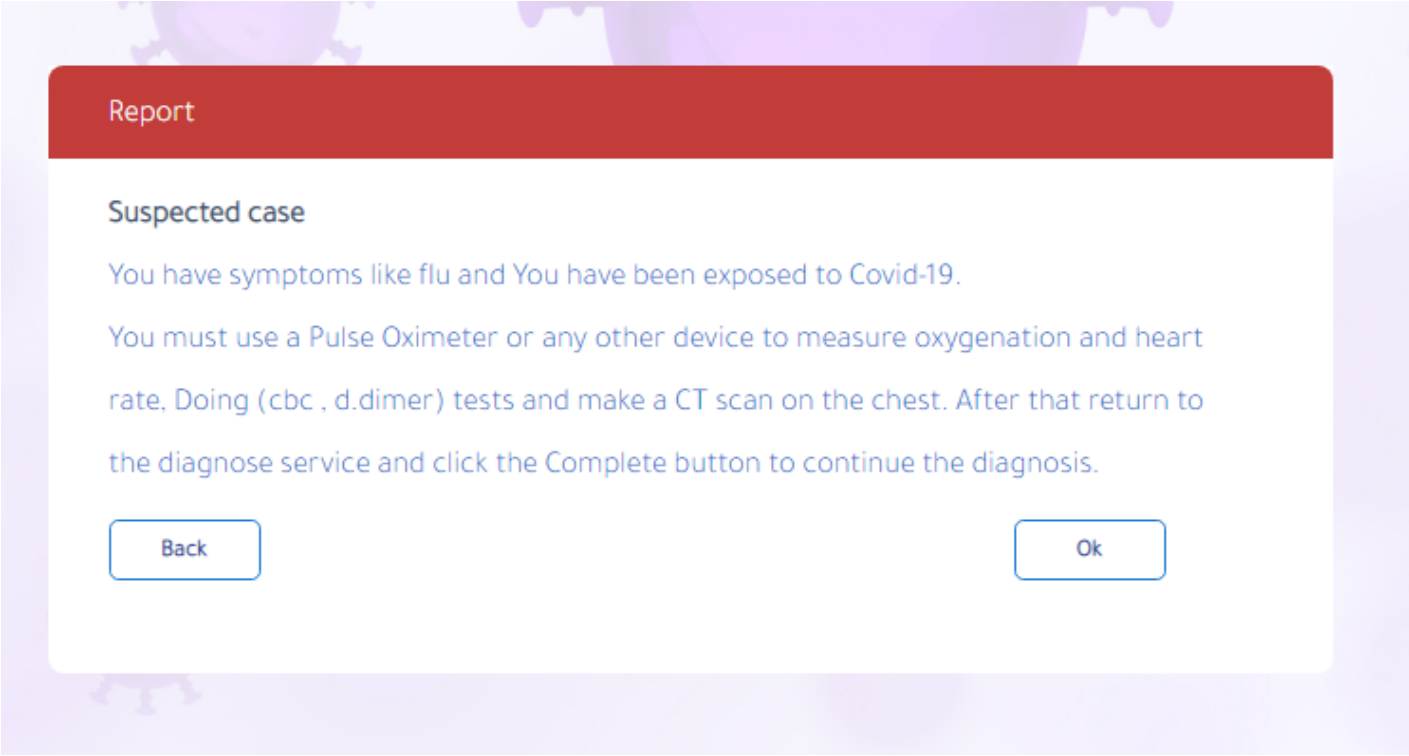


Figure 34 Suspected Case

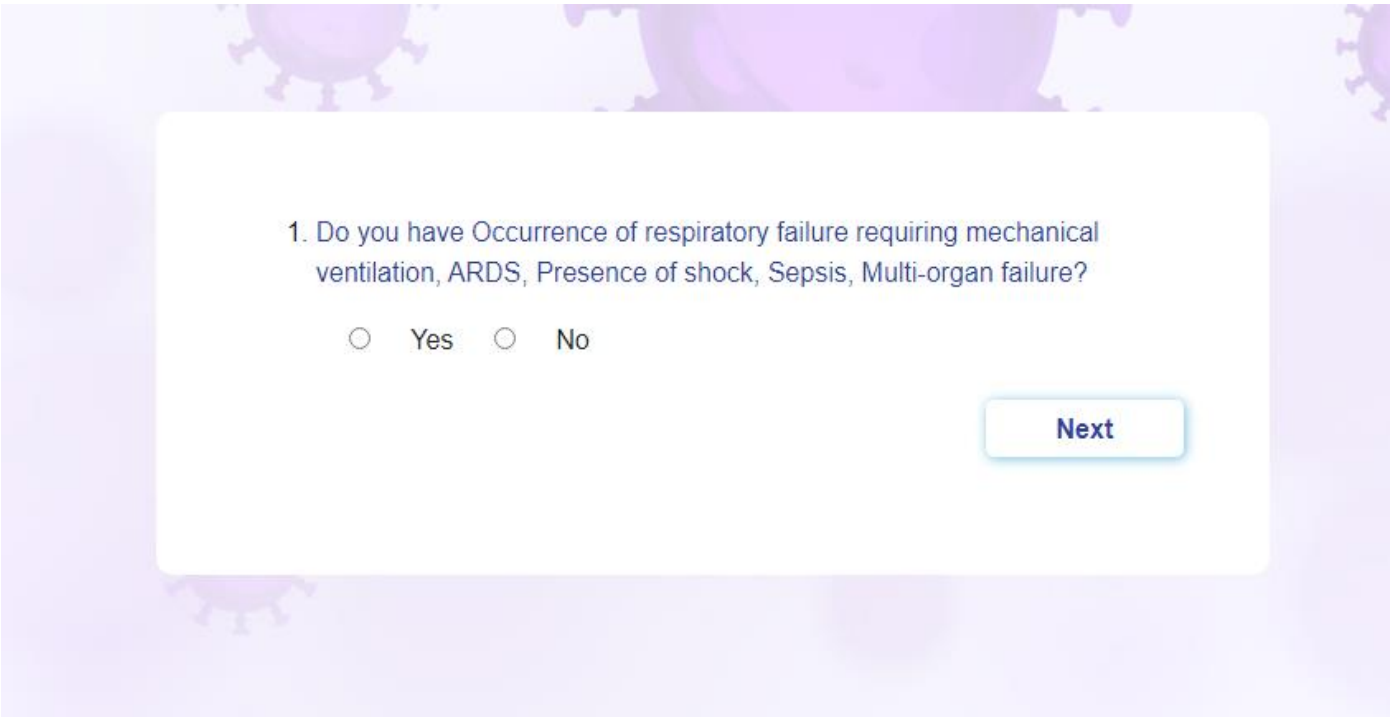


Figure 35 Failure Check

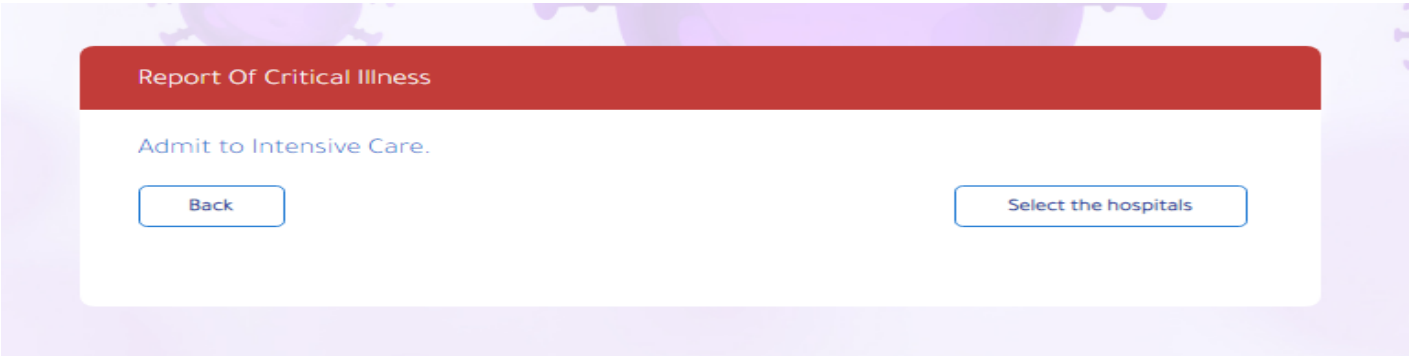


Figure 36 Critical Report

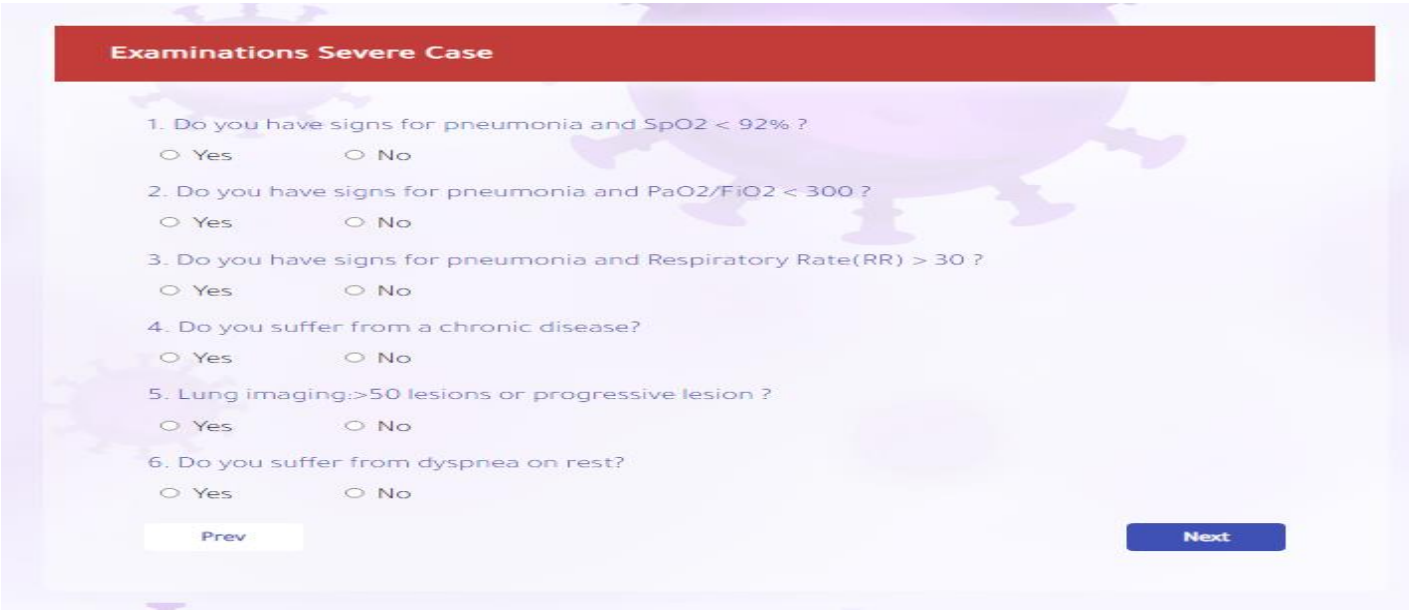


Figure 37 Severe Form

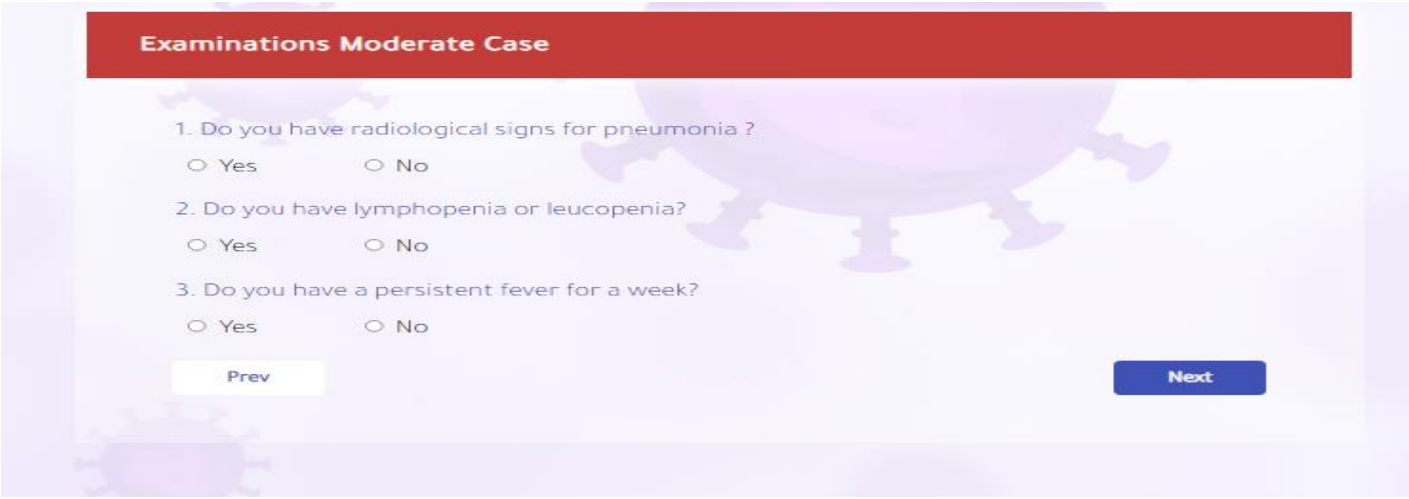


Figure 38 Moderate Form

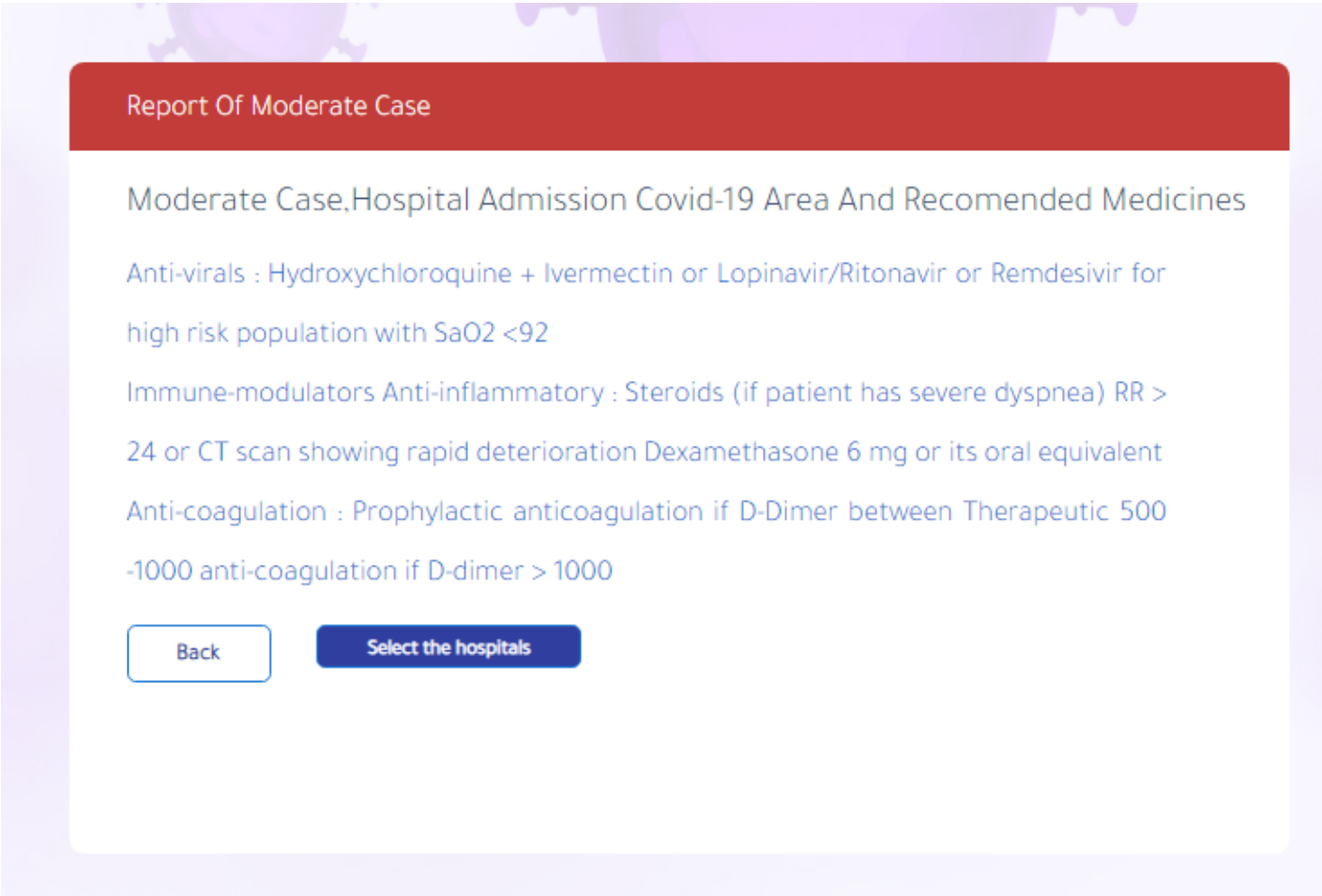


Figure 39 Report of Moderate Case

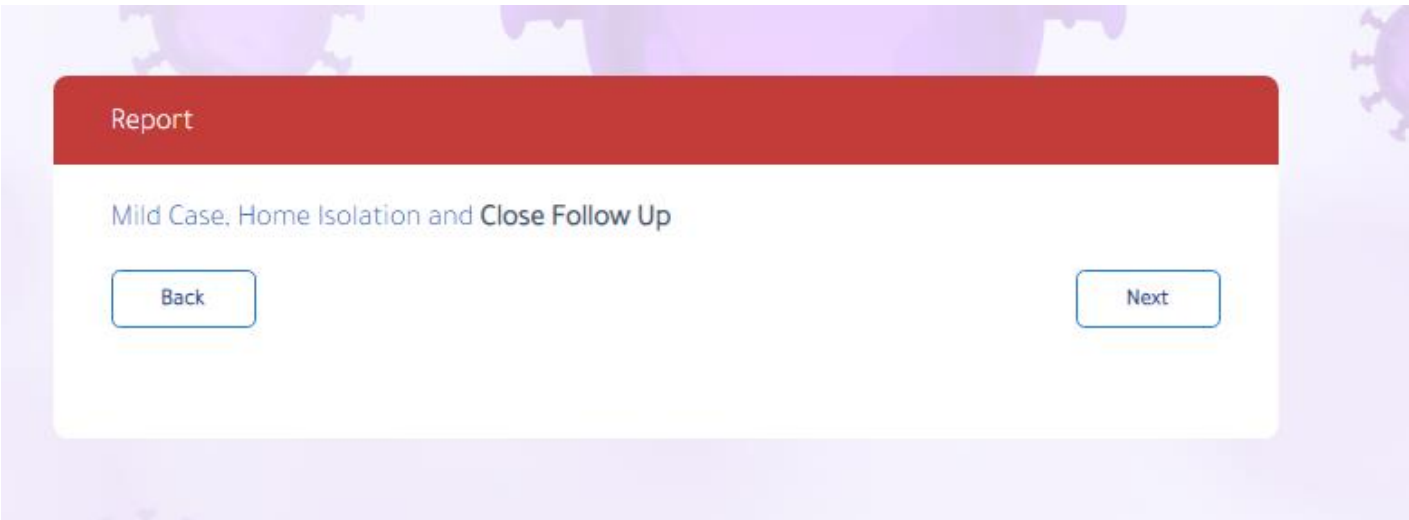


Figure 40 Mild Report

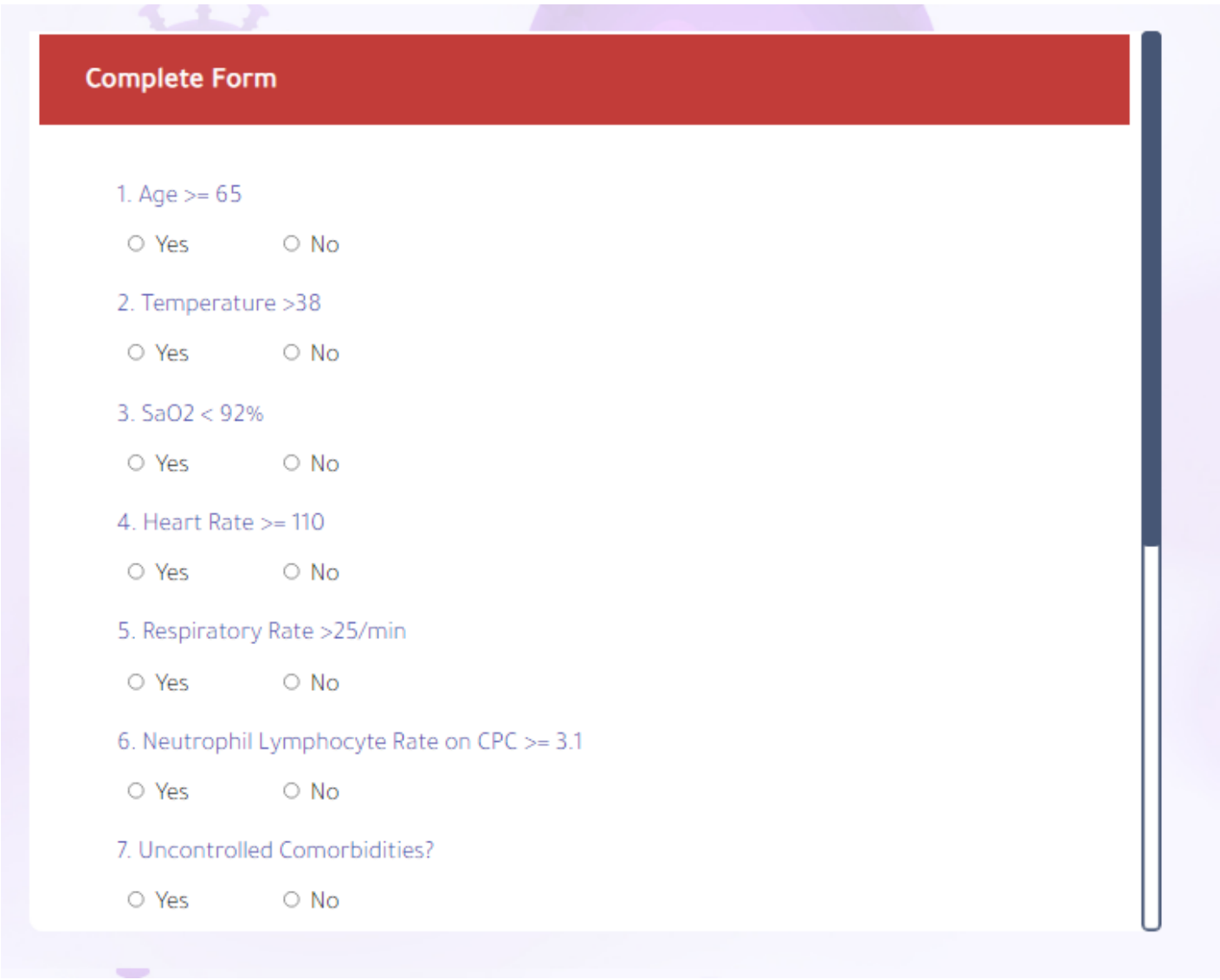


Figure 41 Check Mild Case

Figure 42 Home Isolation

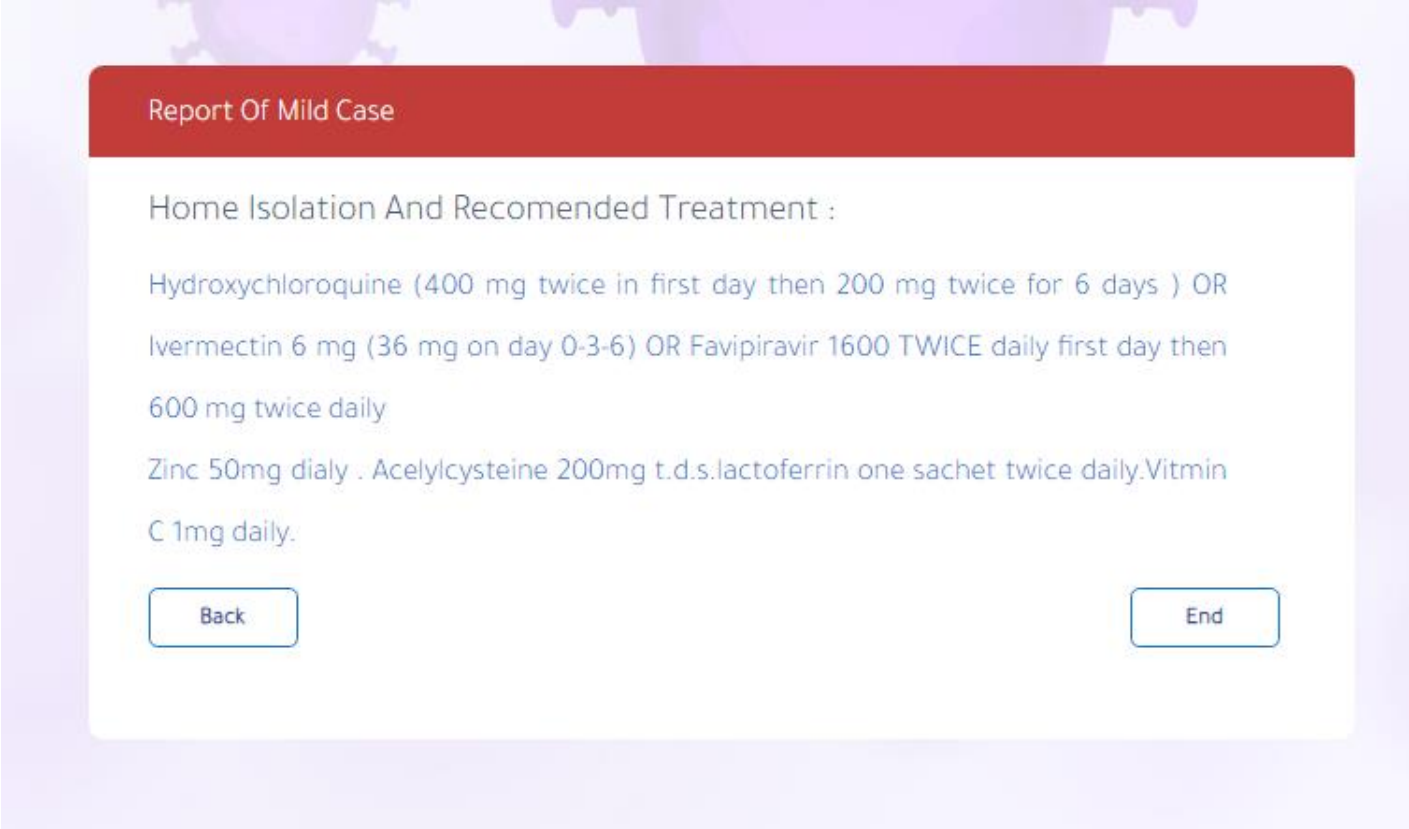


Figure 43 Report of Mild case

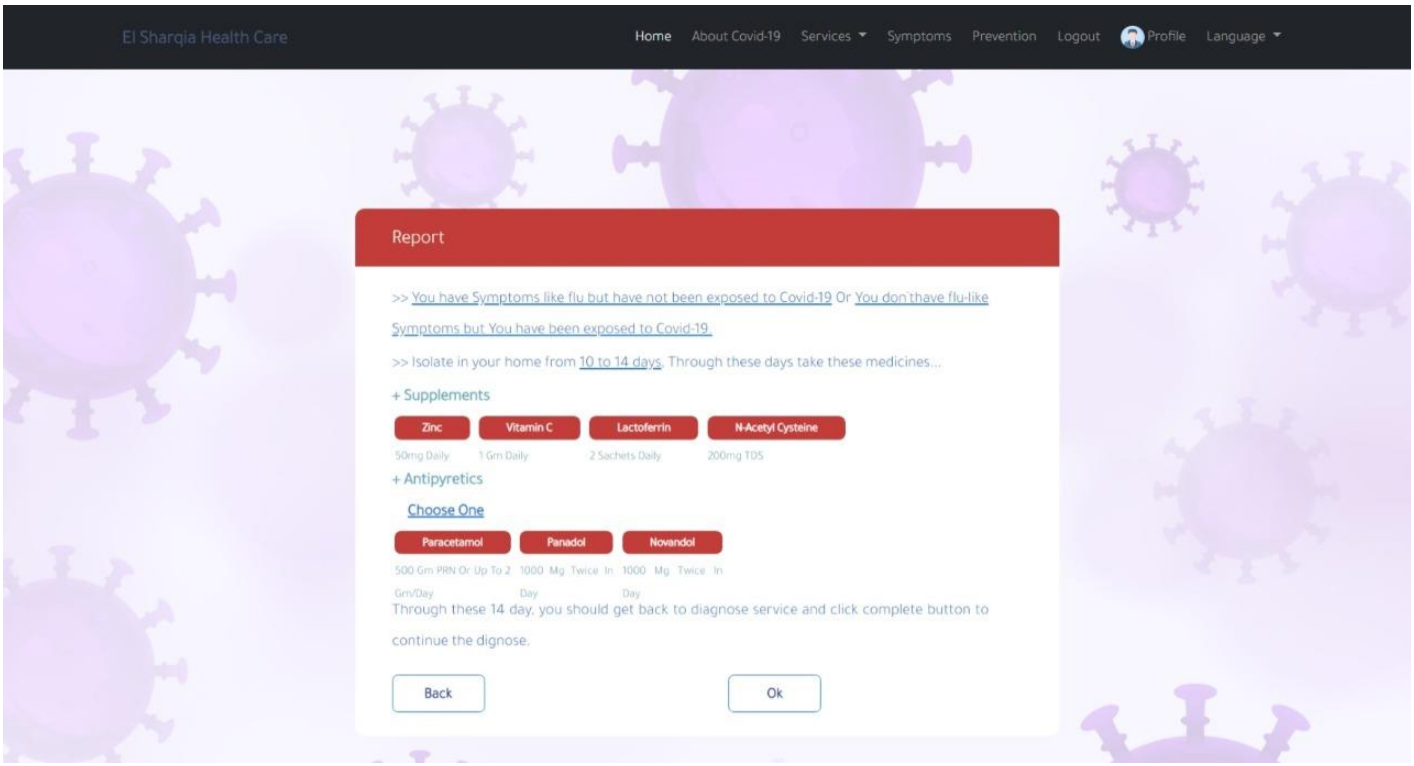


Figure 44 Isolation

Figure 45 check stable

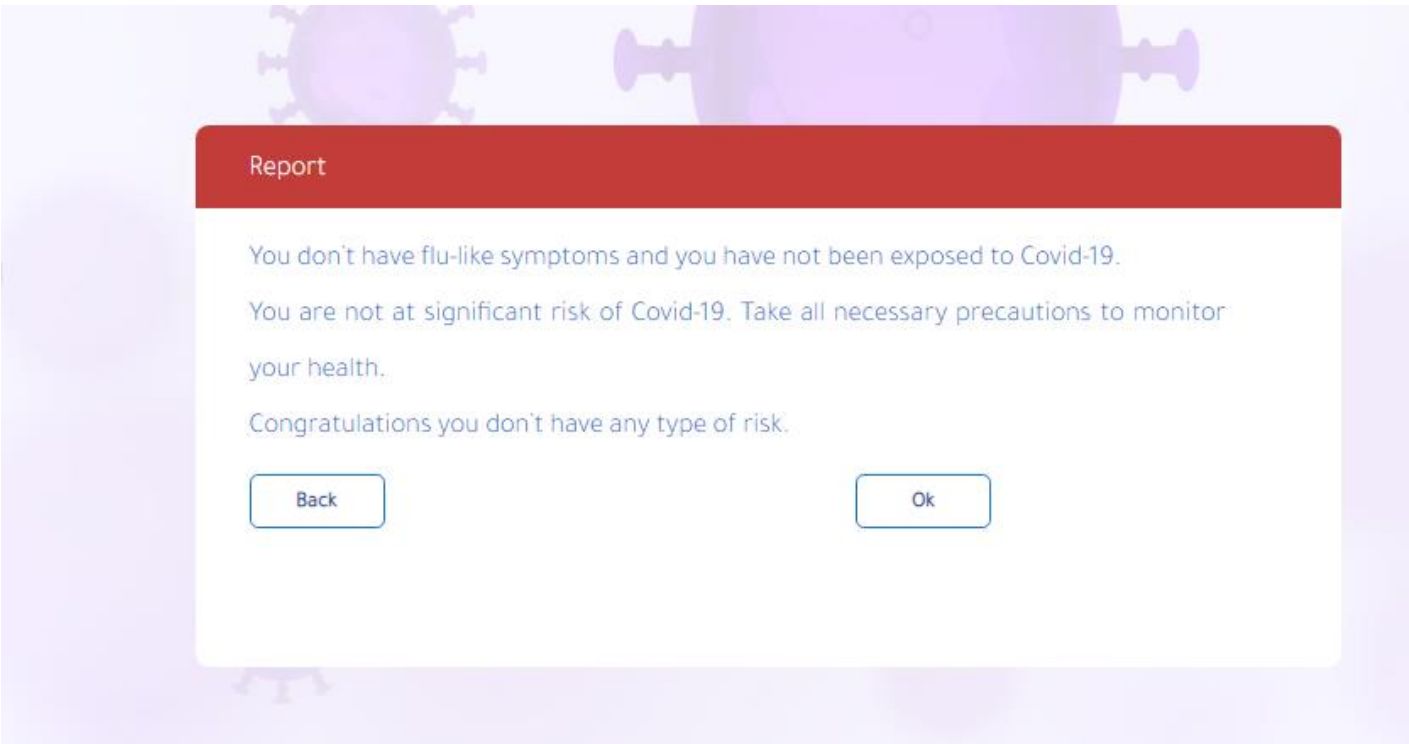


Figure 46 The Best Case

4.5 Data Storage Design.

A database is a collection of groupings of information that are related to each other in some way, and a DBMS (database management system) is software that creates and manipulates these databases. There are four types of databases that are likely to be encountered during a project: legacy, relational, object, and multidimensional. The legacy databases (e.g., hierarchical databases and network databases) use older, sometimes outdated technology and are rarely used to develop new applications. The relational database is the most popular kind of database for application development today, and it is based on collections of tables that are related to each other through common fields known as foreign keys. Object databases contain data and processes that are represented by object classes, and relationships between object classes are shown by encapsulating one object class within another and are mainly used in multimedia applications (e.g., graphics, video, and sound). One of the newest members in the database arena is the multidimensional database, which has become popular with the increase in data warehousing. It stores precalculated quantitative information (e.g., totals, averages) at the intersection of dimensions (e.g., time, salesperson, product) to support applications that require data to be sliced and diced.

4.5.1 User Table.

Field Name	Data type	length	Key	A_t	Default value
User_id	Int	30	Primary key	√	None
Full_Name	Varchar	50			None
email	Varchar	50			None
Age	Int	20			None
Password	Text				None
Birth date	Date				None
Street	Varchar	255			None
City	Varchar	255			None
Phone	Varchar	255			None
Gender	Varchar	255			None
State	Varchar	255			None
Medicine	Text				None
Medicine_history	Text				None

Table 7 User

4.5.2 Hospital Table.

Field Name	Data type	length	Key	A_t	Default value
Hospital_id	Int	30	Primary key	√	None
Hospital Name	Varchar	255			None
Num_beds	Int	200			None
Num_intensive Case_beds	Int	255			None
Region	Varchar	255			None
City	Varchar	255			None
Street	Varchar	255			None
Num_bloods_bank	Int	10			None
Admin_id	Int	255			None
coordination	Varchar	255			None

Table 8 Hospital

4.5.3 Specialization Table.

Field Name	Data type	length	Key	A_t	Default value
Specialization_id	Int	100	Primary key	√	None
Num_specialists	Int	200			None
Num_doctor_consultants	Int	255			None
Num_specialist_assistants	Int	255			None
Num_Residents	Int	255			None
Name_specialization	Varchar	255			None

Table 9 Specialization

4.5.4 Blood Bank Table.

Field Name	Data type	length	Key	A_t	Default value
Blood bank_id	Int	30	Primary key	√	None
Platoon	Varchar	255			None
Hospital_id	Int	30	Foreign key		None

Table 10 Blood Bank

4.5.5 Medicine Table.

Field Name	Data type	length	Key	A_t	Default value
Medicine_id	Int	255	Primary key	√	None
Medicine_Name	Varchar	500			None
Medicine_Type	Varchar	255			None
Discerption	varchar	255			None
Medicine_Case	Int	20			None
Medicine_Organization	Text				None

Table 11 Medicine

4.5.6 Vaccine Conveys Table.

Field Name	Data type	length	Key	A_t	Default value
Vaccine Conveys _id	Int	255	Primary key	√	None
center	Varchar	255			None
Location _name	Varchar	255			None
Start_date	varchar	255			None
End_date	Varchar	255			None
address	Varchar	255			None
coordination	Varchar	255			None
Hospital_id	Int	30	Foreign key		None

Table 12 Vaccine Conveys

4.5.7 Medicine_User Table.

Field Name	Data type	length	Key	A_t	Default value
user_id	Int	30	Foreign key		None
Medicine_id	Int	30	Foreign key		None

Table 13 Medicine_User

4.5.8 Hospital_Phone Table.

Field Name	Data type	length	Key	A_t	Default value
Hospital_id	Int	30	Foreign key		None
Phone	Varchar	50			None

Table 14 Hospital_Phone

4.5.9 Hospital_User Table.

Field Name	Data type	length	Key	A_t	Default value
Hospital_id	Int	30	Foreign key		None
user_id	Int	30	Foreign key		None
Date	date				None

Table 15 Hospital_User

4.5.10 Admin Table.

Field Name	Data type	length	Key	A_t	Default value
Admin _id	Int	255	Primary key	√	None
Name	varchar	255			None
Password	Text				None
Age	Int	255			None
Phone	Varchar	255			None
Email	Varchar	255			None

Table 16 Admin

4.6 Flow Chart.

A diagram that shows step-by-step progression through a procedure or system especially using connecting lines and a set of conventional symbols.

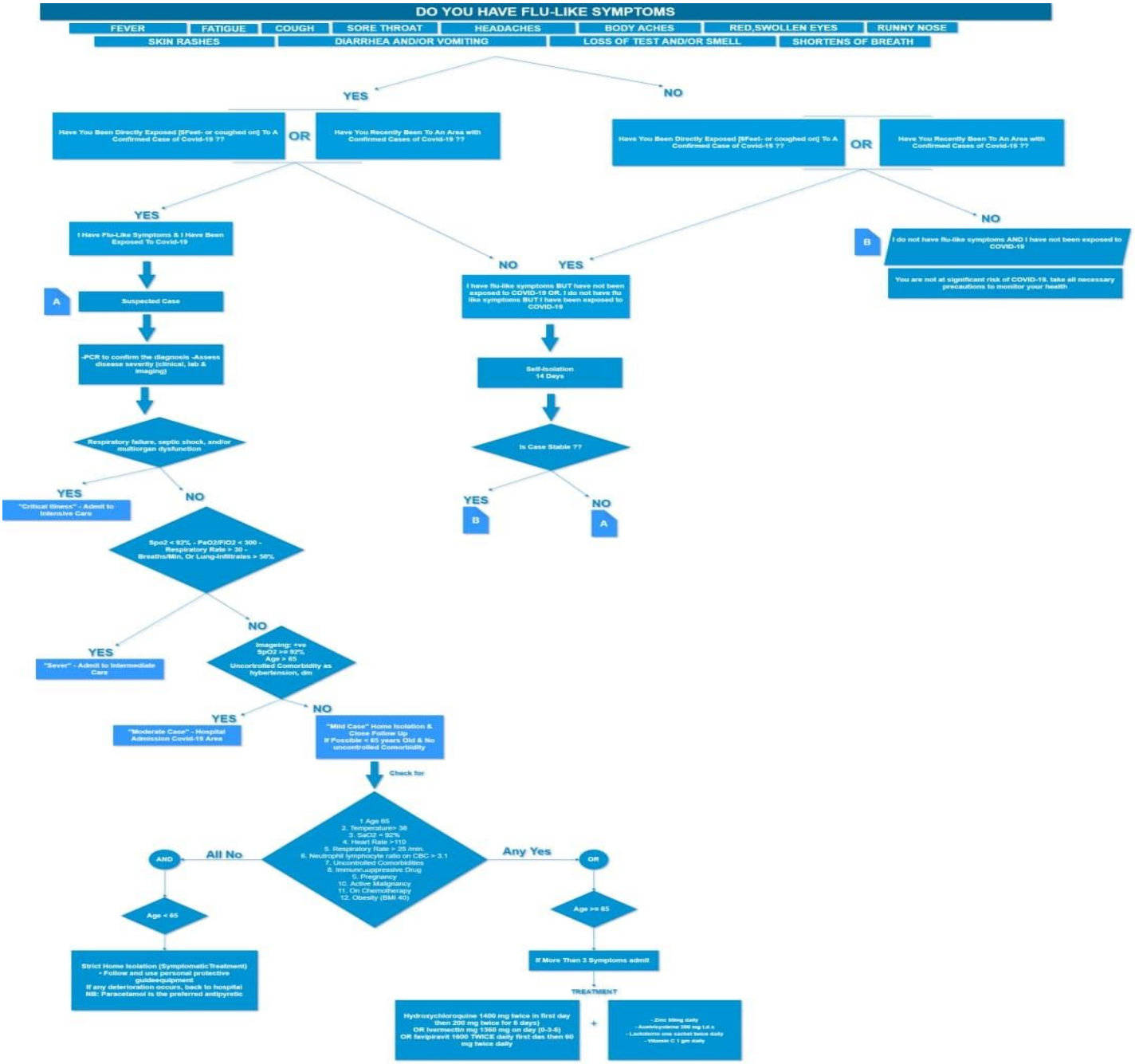


Figure 47 Flow Chart

4.7 Coding.

4.7.1 Database table

```
create table Hospital (
        Hospital_id int (30) NOT NULL AUTO_INCREMENT,
        H_name varchar (255) default null ,
        Num_beds int (200) default null ,
        Num_intensive_case_beds int (255) default null ,
        Region varchar (255) default null,
        City varchar (255) default null,
        Street varchar (255) default null,
        Num_boolds_banks int (255) default null,
        Admin_id int (255) default null ,
        coordination varchar (255) default null,
        PRIMARY KEY (`Hospital_id`),
       FOREIGN KEY (`Admin_id`) REFERENCES `Admin` (Admin_id)
        ON DELETE CASCADE
        ) ENGINE=INNODB;
```

Figure 48 Database table

4.7.2 Index.ejs

```
<div class="counter-single">
                                <h4 class="counter-
title" id="case">Confirmed cases</h4>
                                <span class="counter-amount" id="cases">
                                   <%= covidData.newCases %>
                                </span>
                                <span class="counter-date" id="update">
                                   <%= covidData.latestUpdateDate %>

                                </span>
                            </div>
                        </div>
                        <div class="col-md-2 col-sm-6">
                            <div class="counter-single counter-single-alt">
                                <h4 class="counter-
title" id="death">Confirmed deaths</h4>
```

```
                                <span class="counter-amount" id="deaths">
                                    <%= covidData.newDead %>
                                <span class="counter-
date"><%= covidData.latestUpdateDate %>
                                </span>
                                </span>
                                <span class="counter-date" id="update"></span>
                            </div>
                        </div>
                        <div class="col-md-2 col-sm-6">
                            <div class="counter-single">
                                <h4 class="counter-
title" id="recovered">Total Recovered</h4>
                                <span class="counter-amount" id="recovered">
                                    <%= covidData.totalCured %>
                                    <span class="counter-
date"> <%= covidData.latestUpdateDate %>
                                    </span>
                                </span>
                                <span class="counter-date" id="update"></span>
                            </div>
                        </div>
                        <div class="col-md-2 col-sm-6">
```

4.7.3 Sign-In.ejs

```
                        <li><i class="fab fa-brands fa-linkedin-in fa-1x"></i>
                        </li>
                    </ul>
                    <p class="title text-center">or use your email account</p>
                    <form action="/user/login" method="post">
                        <div class="mb-3">
                         <input type="text"  class="form" placeholder="Email" n
ame="email" required>
                        </div>
                        <div class="mb-3">
                            <input type="password" class="form" placeholder="Pa
ssword" name="password"  required>
                        </div>
                        <% if (success == false) { %>
                            <div class="error text-center">
                              <% if (error.errors.length !== 0) { %>
```

```
                                <% if(error.errors[0].param === "password") {%>
                                 <p class="text-
center"> Password is not correct </p>
                               <%}else if(error.errors[0].param === "email") {%>
                                 <p class="text-
center">Email doesn't registered, Create a new account</p>
                               <%}%>
                                 <% } %>
                             </div>
                           <% } %>
                        <div class="text-center forget">
                        <a href="/user/forgot-
password">Forgot your password?</a>
                        </div>
                        <div class="btn-signin text-center">
                        <!-- <button type="submit" class="btn text-
uppercase">Sign In</button> -->
                        <input type="submit" value="Sign In" class="btn text-
uppercase">

                        </div>
                    </form>
                </div>
```

4.7.4 Diagnose

```
<!--Start Landing Page-->
  <%- include("./partials/navbar.ejs")  %>
  <div class="dagnosis">
    <!-- + Diagnose Service Window -->
    <!-- <aside > -->
        <div class="content diagnose-start" >
            <div class="overlay"></div>
            <aside class="start-daignosis current" expPg="expService">
              <h2>Diagnose Service</h2>
              <p>Diagnostic Services facilitates the provision of timely, cost-
effective,
                and high quality diagnostic care in safe and secure environment
s. It includes the clinical
                 services of Pathology and Laboratory Medicine, Radiology, and
Nuclear Medicine .</p>
              <div class="btn">
```

```
                  <!-- <form action="/diagnose/start" method="get"> -->
                    <a href="/diagnose/start"><button type="button" class="btn-
start">Get Started</button></a>
                  <!-- </form> -->
                  <!-- <form action="/diagnose/complete" method="post"> -->
                    <a href="/diagnose/complete"><button type="button" class="b
tn-complete">Complete</button></a>
                  <!-- </form> -->
              </div>
            </aside>
        </div>
    <!-- </aside> -->
  </div>


  <!-- Start Navbar -->
  <%- include("./partials/navbar.ejs")  %>

  <div class="dagnosis">
    <!-- + Diagnose Service Window -->
    <div class="content diagnose-start" >
      <div class="overlay"></div>
      <aside class="start-daignosis" expPg="expService">
        <h2>Diagnose Service</h2>
        <p>Diagnostic Services facilitates the provision of timely, cost-
effective,
          and high quality diagnostic care in safe and secure environments. It
includes the clinical
           services of Pathology and Laboratory Medicine, Radiology, and Nuclea
r Medicine .
        </p>
        <div class="btn">
            <!-- <form action="/diagnose/start" method="get"> -->
              <a href="/diagnose/start"><button type="button" class="btn-
start">Get Started</button></a>
            <!-- </form> -->
            <!-- <form action="/diagnose/complete" method="post"> -->
              <a href="/diagnose/complete"><button type="button" class="btn-
complete">Complete</button></a>
            <!-- </form> -->
        </div>
      </aside>
```

```
  </div>
    <!-- - Diagnose Service Window -->
    <!-- ------------------------------------------------------ -->
    <!-- + Start All questions of expert system service -->
    <!-- 1.1)Start Prime Check  -->
    <!-- <aside expPg="primeCheck"> -->
        <aside class="diagnosis-one" expPg="primeCheck">
            <ul>
                <li>
```

4.7.5 map

```
// Extract Data )+ Avialable Data about intensive_case beds
const hospitalsData = JSON.parse(document.getElementById("availableHospitals").
textContent);
console.log("---------------------------------------------
 + Available Hosptials -------------------------------------------------------");
console.table(hospitalsData);
console.log("---------------------------------------------
 + Available Hosptials -------------------------------------------------------");

// console.log(hospitalsData.length);
// console.log(hospitalsData);

let patientLocation = {};
let shorestHospitals = [];
let locationSelector = false;
// Sortest hospitals
let ShortestHospitals;
const getLocation = () => {
  if (navigator.geolocation) {
    navigator.geolocation.getCurrentPosition((position) => {
      patientLocation.latitude = position.coords.latitude,
      patientLocation.longitude = position.coords.longitude,
      exeDistance = calculateDistances(),
      sortDistances = sortShortestHospitals(exeDistance),
      displayHospitalsTPatient = displayAvailalbeHospitals(sortDistances)
    });

  } else {
    // x.innerHTML = "Geolocation is not supported by this browser.";
```

```
    console.log("Doesn't Support");
  }
  console.log(patientLocation);
}

// Define the distances between each hospital & patient's location
```

CHAPTER FIVE

TESTING PHASE

5. Chapter Five: Testing Phase.

The testing phase includes quality assurance testing (QA), system integration testing (SIT), and user acceptance testing (UAT). ... And, user acceptance testing (UATs) tests whether the application works the way the customer requires. Developers use test plans to guide them through the testing process

5.1 Log-In Test Case: authenticated (email - password).

Test login process using two authenticated elements needed to enter and login the application [email + password]. **The result** that user can access the website application.

Test Case ID	LOG_IN1.0.0	**Test Case Description**	Test the Login Functionality in Health Case System		
Created By	Ahmed El-Gied	**Reviewed By**	Self	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Ahmed El-Gied	**Date Tested**	April 19, 2021	**Test Case (Pass/Fail/Not Executed)**	pass

S #	Prerequisites:	S #	Test Data
1	Access to Chrome Browser	1	**email** = testcase1@gmail.com
2	online access	2	**Pass** = testcase1testcase1
3		3	
4		4	

Test Scenario	Verify on entering authenticated email and authenticated password, [1. the patient can login]

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000	Site should open	As Expected	Pass
2	Enter email & Password	Credential can be	As Expected	Pass
3	Click Submit	Cutomer is logged in	As Expected	pass
4				

Table 17 Log-In Test Case: authenticated (email - password)

5.2 Log-In Test Case: (authenticated email – Unauthenticated password).

Test login process using just one only authenticated element and the another is unauthenticated (authenticated email & Unauthenticated password). **The result** that the access must be denied.

Test Case ID	LOG_IN1.1.0	**Test Case Description**	Test the Login Functionality in Health Case System		
Created By	Ahmed El-Gied	**Reviewed By**	Self	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Ahmed El-Gied	**Date Tested**	April 19, 2021	**Test Case (Pass/Fail/Not**	pass

S #	Prerequisites:	S #	Test Data
1	Access to Chrome Browser	1	**email** = testcase1@gmail.com
2	online access	2	**Pass** = anythingrandom
3		3	
4		4	

Test Scenario Verify on entering authenticated email and unauthenticated password, [1. the patient cann't login]

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000	Site should open	As Expected	Pass
2	Enter email & Password	Credential can be	As Expected	Pass
3	Click Submit	Cutomer cann't log in	As Expected	pass

Table 18 Log-In Test Case: (authenticated email – Unauthenticated password)

5.3 Log-In Test Case: Unauthenticated (email - password).

Test login process using two unauthenticated elements needed to enter and login the application [unauthenticated email + unauthenticated password]. **The result** that user cannot access the website application.

Test Case ID	LOG_IN1.1.0	**Test Case Description**	Test the Login Functionality in Health Case System		
Created By	Ahmed El-Gied	**Reviewed By**	Self	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Ahmed El-Gied	**Date Tested**	April 19, 2021	**Test Case (Pass/Fail/Not Executed)**	pass

S #	Prerequisites:
1	Access to Chrome Browser
2	online access

S #	Test Data
1	**email** = anythingrandom@gmail.com
2	**Pass** = anythingrandom

Test Scenario Verify on entering unauthenticated email and unauthenticated password, [1. the patient cann't login]

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000	Site should open	As Expected	Pass
2	Enter email & Password	Credential can be	As Expected	Pass
3	Click Submit	Cutomer cann't log in	As Expected	pass
4				

Table 19 Log-In Test Case: Unauthenticated (email - password)

5.4 Log-Out Test Case.

Test log-out process. **The result** that user can logout the website application.

Test Case ID	LOG_OUT_1.0.0	**Test Case Description**	Test the logout Functionality in Health Case System		
Created By	Mohamed & Sara	**Reviewed By**	Mahmoud	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Ahmed El-Gied	**Date Tested**	April 20, 2021	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	Prerequisites:
1	Access to Chrome Browser
2	online access
3	
4	

S #	Test Data
1	**email** = testcase1@gmail.com
2	**Pass** = testcase1testcase1
3	
4	

Test Scenario Verify after user logout system, he dierectly redirect to login Page, and he cann't get the authenticated pages

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000/user/login	login page should open	As Expected	Pass
2	Enter email & Password	Credential can be entered	As Expected	Pass
3	click submit	home appears	As Expected	Pass
4	click logout	login page appeared	As Expected	Pass
	get profile page	redirect login page	As Expected	Pass

Table 20 Log-Out Test Case

5.5 Sign-Up Test Case: (Unregistered Account).

Test sign up process. **The result** that user can sign-up therefore and new user account created for that user.

Test Case ID	SIGN_UP_1.0.0	Test Case Description	Test the SignUp Functionality in Sharqia Health Map		
Created By	Ahmed El-Gaied	Reviewed By	Mahmoud	Version	1.0.0
QA Tester's Log	No Comment you can use, None				
Tester's Name	Nazih, & Aminah	Date Tested	April 19, 2021	Test Case (Pass/Fail/Not Executed)	Pass

S #	Prerequisites:	S #	Test Data
1	Access to Specific Browser	1	password must be at least 12 chars
2	Have an online access	2	
3	Have the link of system	3	

Test Scenario	verify on entering doesn't registered email & valid password, [1. user can register]

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000/user/signup	System should open	as expected	Pass
2	Enter full name, doesn't registered email & valid Password, confirm password	user's data can be entered	as expected	Pass
3	Click Submit	Cutomer is registered & redirected to home page	as expected	Pass

Table 21 Sign-Up Test Case: (Unregistered Account)

5.6 Sign-Up Test Case: (Registered Account).

Test sign up process. **The result** that user can create a new account and a warn message say 'the email already exists'.

Test Case ID	SIGN_UP_1.1.0	**Test Case Description**	Test the Sign Up Functionality in Sharqia Health Case System		
Created By	Ahmed El-Gaied	**Reviewed By**	Mohamed	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Mahmoud, & Nazih	**Date Tested**	April 9, 2021	**Test Case (Pass/Fail/Not Executed)**	pass

S #	Prerequisites:
1	Access to Specific Browser
2	Online Access
3	System Link
4	

S #	Test Data
1	password at least 15 characters
2	email = testcase@gmail.com
3	
4	

Test Scenario Verify on entering previous Registered email, [1. display message "email already exists"]

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000	Site should open	as expected	pass
2	Enter previous Registered email & data	data can be entered	as expected	pass
3	Click Submit	Error will be displayed "email already exists"	as expected	pass

Table 22 Sign-Up Test Case: (Registered Account)

5.6 Complete Diagnose.

Test complete the diagnose service of covid-19. **The result** that user can complete after the last case of diagnose service to get the diagnostic report.

Test Case ID	COMPLETE1.0.0	**Test Case Description**	Test the completion of diagnose		
Created By	Ahmed El-Gied	**Reviewed By**	Mohamed	**Version**	1.0.0
QA Tester's Log	None				
Tester's Name	Mohamed, & Aminah	**Date Tested**	April 25, 2021	**Test Case (Pass/Fail/Not Executed)**	pass

S #	Prerequisites:	S #	Test Data
1	Access to Chrome Browser	1	**email** = testcase1@gmail.com
2	online access	2	**Pass** = testcase1testcase1
3		3	
4		4	

Test Scenario Verify on entering a **examinations case account** the user gets the **failure check page**

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to http://localhost:3000/diagnose	Site should open	As Expected	Pass
2	Enter examination account	Credential can be entered	As Expected	Pass
3	Click Submit	Cutomer is logged in	As Expected	pass
4	redirect to failure check page	failure page appears	As Expected	pass

Table 23 Complete Diagnose

CHAPTER SIX

NEXT LEVEL

6. Chapter Six: Next Level.

7.1 Application Issues.

1. DNS, Firewall, And Network Connectivity.
2. Database Deadlocks.
3. Scalability.
4. Performance
5. Slow Servers & Loading Time.

7.2 Features Updates.

1. Enable Automated Updates Of Database.
2. Improve The Interfaces UI.
3. Revise The Last Updates About Covid-19 Through World Health Organizations.
4. Enhance The Security Of Website.

7.3. New Ideas.

1. Establish a full medical map for our country Al-Sharkia where we will add pharmacies, clinics of doctors, and medical conveys.
2. Enable Register Through More Than One Source Such As Linkedin, Facebook & Google Etc…
3. Connect The Places Of Vaccine Conveys With Our Website Where The User Can Know Through Us More Precise Information About The

Vaccine Conveys Such As The What The Numbers Of Available Vaccine Coveys Exists?

4. Examine The Images Of Many Scans Such As Ct Scan Using Ml & Ai.
5. Support An Application For Android And Ios.
6. Start Executing The Project For All Our Country.
7. Improve The Diagnose Of Covid-19 Using Machine Learning & Ai Technologies.
8. Support Channels Between Our Patients & Doctors Via Direct Chat.
9. Avoid crowded places that lead to the spread of the disease.

APPENDIX

Diagnosis :

Obtaining a copy of the official treatment protocol for Corona virus by a doctor working in the health insurance in Cairo. The latest update of the official protocol for the diagnosis and treatment of Corona virus was also obtained by the head of the Fever Department at Minya Al-Qamh General Hospital. The head of the diets department was contacted more than once and the diagnosis was presented to him, and it was confirmed that if the person had any of the symptoms, he was in the circle of doubt, meaning that it was possible that he was sick with a normal flu, Corona or any other disease, his condition was determined through analyzes and CT scans on the chest To confirm whether he was infected with the virus or not, if he was infected with the virus, he should follow his treatment protocol.Contact was also made with a consultant doctor of internal medicine, liver and gastrointestinal endoscopy who works in one of the isolation hospitals. He emphasized the diagnosis, in addition to the benefit of the vaccine, which is that the vaccine reduces the severity of symptoms of the Corona virus and reduces the death rate, and here the role of the project comes more to determine the patient's condition.

1st Step: Triage
Case definition + severity assessment

Suspect Case Definition

A) Clinical AND epidemiological criteria:

- Acute onset of fever and cough OR
- ≥ 3 of the followings: fever, cough, sore throat, coryza, general weakness/fatigue, headache, myalgia, dyspnea, anorexia/nausea/vomiting, diarrhea, altered mental status

And 1 of the followings within 14 days of symptom onset:

- Residing or working in an area with high risk of transmission*
- Working in a healthcare setting
- Residing or travel to an area with community transmission

OR:

B

Patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever ≥ 38°C and a cough; onset within last 10 days; requires hospitalization)

*Closed residential settings, humanitarian settings such as camp and camp-like settings for displaced persons.

NB: Minimal role for the epidemiological criteria during the period of community spread

Probable Case

A patient who meets clinical criteria AND is a contact of a probable or confirmed case, or epidemiologically linked to a cluster with at least one confirmed case.

OR

Suspect case with chest imaging showing findings suggestive of COVID-19 disease*

OR

Recent onset of loss of smell or taste in the absence of any other identified cause

OR

Unexplained death in an adult with respiratory distress who was a contact of a probable or confirmed case or epidemiologically linked to a cluster with at least 1 confirmed case

*Hazy opacities with peripheral and lower lung distribution on chest radiography; multiple bilateral ground glass opacities with peripheral and lower lung distribution on chest CT; or thickened pleural lines, B lines, or consolidative patterns on lung ultrasound.

Confirmed Case

A person with laboratory confirmation* of COVID-19 infection, irrespective of clinical signs and symptoms

*Molecular testing(PCR) with deep nasal swab is the current test of choice for the diagnosis of acute COVID-19 infection

During seasonal flu period, clinical differentiation between influenza and COVID 19 is difficult. Swab for influenza A &B may help in early differentiation.

Figure 49 1st : Triage case definition+severity assessment

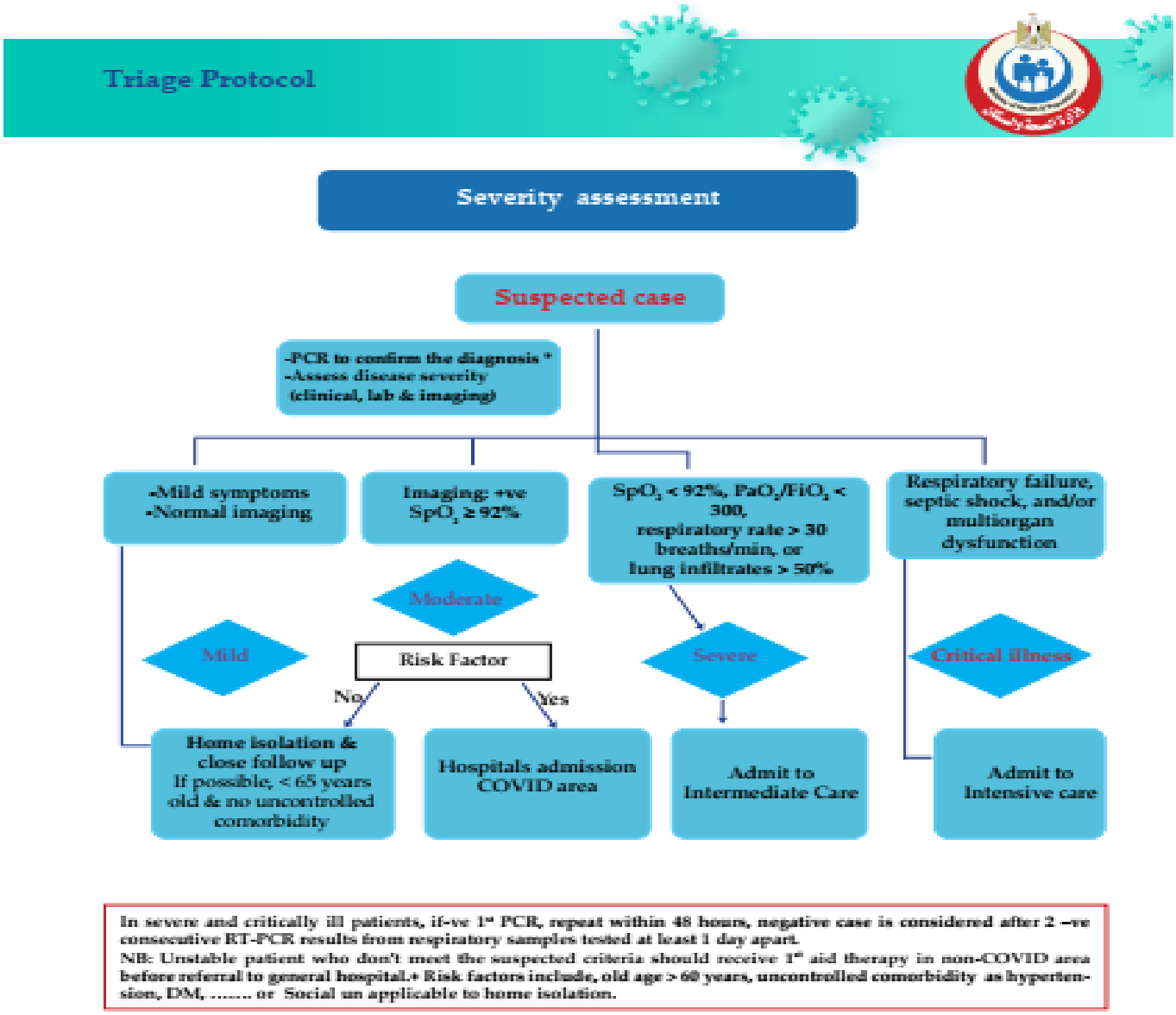


Figure 50 suspected case

2nd Step: Management

All patients with symptomatic COVID-19 and risk factors for severe disease should be closely monitored. The clinical course may rapidly progress in some patients.
Antibiotics are not recommended to prevent bacterial infection in mild patients. Administer empiric antibiotics if bacterial pneumonia/sepsis strongly suspected; re-evaluate daily.
In non-hospitalized patients, do not initiate therapeutic anticoagulants or antiplatelet unless other indications exist.
No harmful effect for administration of vitamin C or D or Zinc or Lactoferrin within the required daily dose.

Check Every Patient For Risk Factors
. Age 65 years
. SpO2 < 92%
. Heart Rate ≥110
. Respiratory Rate ≥ 25 /min.
. Neutrophil / lymphocyte ratio on CBC ≥ 3.1
. Uncontrolled Comorbidities
. On Immunosuppressive or chemotherapy drug
. Pregnancy
. Active Malignancy
. Obesity (BM>40)

Time is an important issue in management of COVID-19. Before day 12(stage of viral load), Antiviral drug is essential. After day 12, the role of antiviral declines with augmentation for the role of anti-inflammatory, immune-modulators and Supportive drugs (stage of hyper-immune state).

Potential antiviral drugs under evaluation for the treatment of COVID-19 include:
- **Hydroxy Chloroquine** 400mg/ 12 hours 1st day followed by 200 mg/12 hours for 6 days,
- **Ivermectin** 6 mg (36 mg on day 0 -3-6),
- **Favipiravir** 1600 twice daily first day then 600 mg twice daily,
- **Remdesivir** 200 mg IV on day 1, followed by 100 mg IV daily for high risk population for 5 days that could be extended to 10 days if the response is unsatisfactory or
- **Lopinavir/Ritonavir** 200/ 50 mg 2 tablets PO BID
- **Monoclonal antibodies**: early testing in blocking SARS-CoV-2.
- **Convalescent plasma**: for impending severely ill after counseling the scientific committee

Mild illness

Home isolation and **symptomatic treatment** (eg, antipyretics for fever, adequate nutrition, appropriate rehydration).
Educate the patients on signs/symptoms of complications that, if developed, should prompt pursuit of urgent care.
There are insufficient data to recommend either with or against any antiviral or immune-based therapy in patients with COVID-19 who have mild illness.

Figure 51 2nd step : Management

Flu or COVID-19

IS IT A FLU OR COVID-19?		
SYMPTOM	FLU	COVID-19
FEVER	✓	✓
FATIGUE	✓	✓
COUGH	✓	✓
SORE THROAT	✓	✓
HEADACHES	✓	✓
RUNNY NOSE	✓	✓
SHORTNESS OF BREATH	✓	✓
BODY ACHES	✓	✓
DIARRHEA AND/OR VOMITING	✓	✓
ONSET	1-4 days after infection	About 5 days after infection but can range from 2-14 days
LOSS OF TASTE AND/OR SMELL		✓
RED, SWOLLEN EYES		✓
SKIN RASHES		✓

All patients with symptomatic COVID-19 and risk factors for severe disease should be closely monitored. In some patients, the clinical course may rapidly progress.

Figure 52 IS it A flu or covid-19?

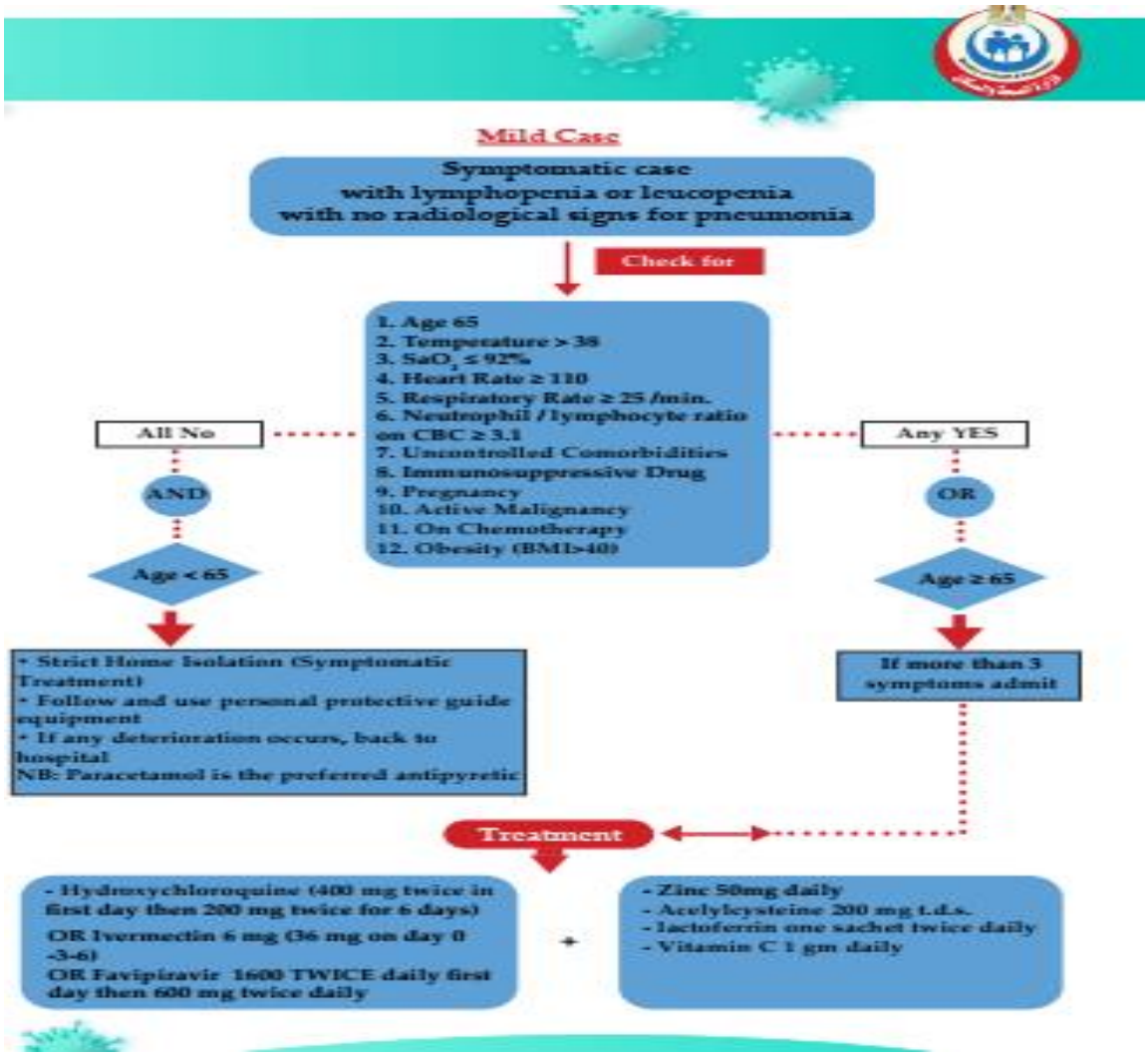


Figure 53 mild case

Moderate Case

Patient has pneumonia manifestations on radiology associated with symptoms &/Or leucopenia or lymphopenia.

Anti-virals	Immune-modulators Anti-inflammatory	Anti-coagulation
Hydroxychloroquine + Ivermectin or	Steroids (if patient has severe dyspnea) RR>24 or CT scan showing rapid deterioration Dexamethasone 6 mg or its oral equivalent	Prophylactic anticoagulation if D-Dimer between 500 -1000 Therapeutic anti-coagulation if D-dimer > 1000
Lopinavir/Ritonavir or		
Remdesivir for high risk population with SaO2 < 92		

Figure 54 moderate case

Severe cases

RR > 30, SaO2 < 92 at room air, PaO_2/FiO_2 ratio < 300, Chest radiology showing more than 50% lesion or progressive lesion within 24 to 48 hrs.

Admit to Intermediate Care

Anti-virals	Anti-coagulant Prophylactic	Anti-inflammatory	Convalescent plasma
Remdesivir or Lopinavir/ Ritonavir	anticoagulation if D-Dimer between 500 -1000 Therapeutic anti-coagulation if D-dimer > 1000 Or if severe hypoxia	Steroids (Dexamethasone 6 mg or methyl prednisolone (1 mg / kg /24 hours) Tocilizumab 4-8 mg/kg/day for 2 doses 12 to 24 hours apart after failure of steroid therapy to improve the case for 24 hours	Before day 12 (under clinical trial) (after scientific committee approval)

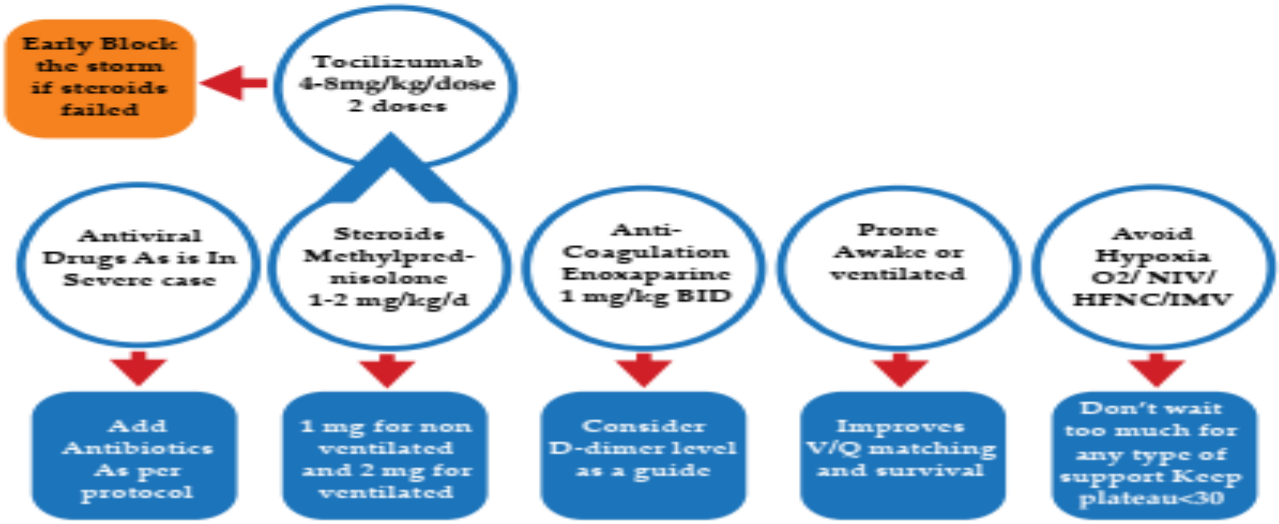
Figure 55 severe case

Critically ill patients

RR > 30, Sa02 < 92 at room air, PaO2/FiO2 ratio < 300, Chest radiology showing more than 50% lesion or progressive lesion within 24 to 48 hrs. Critically ill if SaO2 <92, or RR>30, or PaO2/FiO2 ratio < 200 despite Oxygen Therapy.

Admit to Intensive care

Anti-virals	Anti-coagulant	Anti-inflammatory
Remdesivir or Lopinavir/ Ritonavir	Therapeutic anti-coagulation	Steroids (Methyl prednisolone 2mg /kg or its equivalent) Tocilizumab 4-8 mg/kg/day for 2 doses 12 to 24 hours apart after failure of steroid therapy to improve the case for 24 hours



High flow nasal oxygen is an important modality in the early management of critically ill patients.

Figure 56 critically ill patients

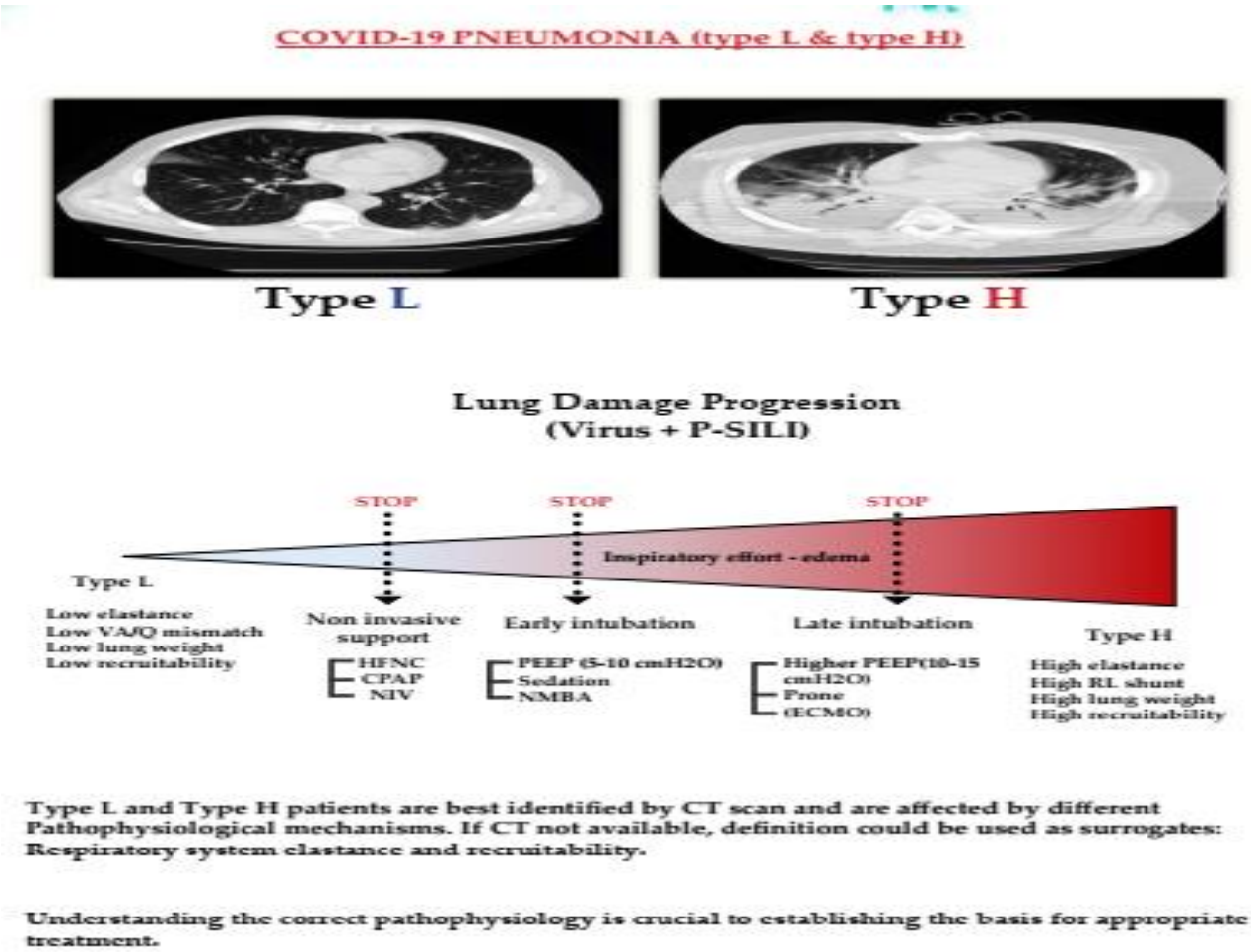


Figure 57 COVID-19 Pneumonia(type L & type H)

Symptomatic case
With lymphopenia or leucopenia
With no radiological signs for pneumonia

Mild cases

One Antiviral agent		
	Ivermectin 6 mg	36 mg on days 0-3-6
OR	Hydroxychloroquine	First day (400 mg twice). Then 200 mg twice for 6 days

Plus	
Supportive care	
Zinc	50 mg once daily
Acetylcysteine	200 mg three times daily
Lactoferrin	One sachet twice daily
Vitamin C	1 gm once daily

Figure 58 mild case and treatment

Symptomatic case With radiological signs for pneumonia &/or lymphopenia or leucopenia

Moderate cases

Antiviral agents (Combination therapy)[a]	
Hydroxychloroquine	First day (400 mg twice). Then 200 mg twice for 6 days
Ivermectine 6 mg	36 mg on days 0-3-6

+/- Immune-modulators Anti-inflammatory	
Indicated in case of "severe dyspnea, RR>24 , CT shows rapid deterioration".	
Dexamethasone	6 mg/day

+/- Enoxaparin according to D-Dimer level*	
D-Dimer (500-1000)	Prophylaxis anticoagulation 40 mg SC once daily
D-Dimer(> 1000) (Or if severe hypoxia)	Therapeutic anticoagulation 1 mg/kg SC every 12 hours

[a] Use Mono antiviral therapy with Remdesivir in case of high risk population with $SaO_2 < 92$

*Use Heparin in case of renal impairment.

Figure 59 moderate case and treatment

RR >30, SaO2<92 at room air, PaO2/FiO2 ratio < 300, Chest radiology showing more than 50% lesion or progressive lesion within 24 to 48 hrs.

Severe cases

Admit to Intermediate care

Antiviral agent (Single agent)	
Remdesivir	First day (200 mg IV single dose) Then 100 mg once daily for 5-10 days.

Plus Immune-modulators Anti-inflammatory	
Dexamethasone	6 mg/day

+/- Enoxaparin according to D-Dimer level*	
D-Dimer (500-1000)	Prophylaxis anticoagulation 40 mg SC once daily
D-Dimer(> 1000) (Or if severe hypoxia)	Therapeutic anticoagulation 1 mg/kg SC every 12 hours

*Use Heparin in case of renal impairment.
Methylprednisolone 1mg/Kg/day can be used if Dexamethasone is not available.
If steroids failed to improve the case within 24 hours, Tocilizumab can be used.

Figure 60 severe case and treatment

RR >30, SaO2<92 at room air, PaO2/FiO2 ratio < 300, or PaO2/FiO2 ratio < 200 despite oxygen therapy, Chest radiology showing more than 50% lesion or progressive lesion within 24 to 48 hrs.

Critically ill

Admit to ICU

Administer High flow nasal oxygen
Avoid hypoxia "O2/NIV/HFNC/IMV"

Antiviral agent (Single agent)	
Remdesivir	First day (200 mg IV single dose). Then 100 mg once daily for 5-10 days.
Plus **Immune-modulators Anti-inflammatory**	
Methylprednisolone	1 mg/kg/day for non ventilated. 2 mg/kg/day for ventilated.
PLUS **Therapeutic anticoagulation**	
Enoxaparin*	1 mg/kg SC every 12 hours.

*Use Heparin in case of renal impairment.
If steroids failed to improve the case within 24 hours, Tocilizumab can be used.

Figure 61 critical case and treatment

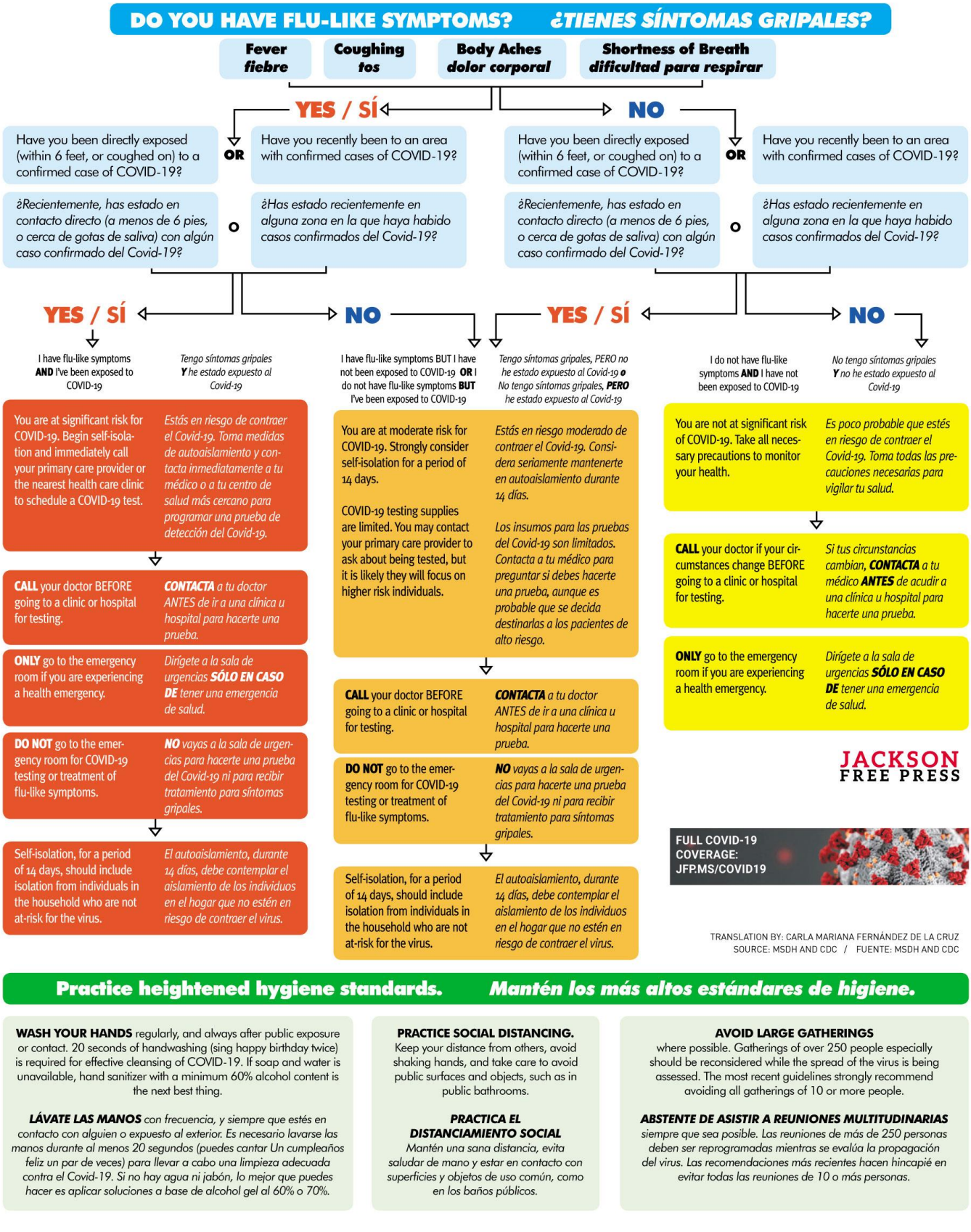


Figure 62 example covid-19 flow chart

Database :

A copy of the database of hospitals in AL-Sharkia Governorate was obtained from the governorate office and a copy of the database of vaccine centers at the governorate level. And get the longitude and latitude of each hospital from Google Maps.

عدد الأسرة الفعالة بالمستشفيات التابعة لمديرية الشئون الصحية	
اسم المستشفي	عدد الأسرة
الزقازيق العام	165
فاقوس المركزي	227
القنايات المركزي	100
منيا القمح	173
بلبيس	213
ههيا	166
ابو حماد	76
ديرب نجم	182
الزوامل	27
الصالحية	80
السعديين	109
مشتول السوق	108
الابراهيمية	80

Table 24 Database (num of beds)

وحدات العناية المركزة	
اسم المستشفي	عدد الأسرة
الزقازيق	58
فاقوس	34
القنايات	24
منيا القمح	31
بلبيس	26
ههيا	32
ابوحماد	10
ديرب نجم	16
الصالحية	7
مشتول السوق	11
الابراهيمية	13

Table 25 database(intensive care)

REFERENCE

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https://egcovac.mohp.gov.eg/#/home.

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https://www.healthline.com/health/fever#what-to-look-for

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https://preview.themeforest.net/item/cov19-coronavirus-covid19-social-awareness-and-medical-prevention-template/full_screen_preview/28416737?_ga=2.91899098.1161845137.1618387872-1383097166.1618305741

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