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Web-Based Information System for Covid19 in Yemen

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Abstract: The world pandemic coronavirus (COVID19) has affected the Yemen health system and human healthcare is because a high impacts the lack of response to COVID19. Moreover, Yemen has been a disaster by concomitant outbreaks of other communicable diseases such as cholera, malaria and dengue the expense of primary healthcare support to the pandemic coronavirus will undermine existing health system strengthening efforts worsen the humanitarian crisis and will accentuate the impact of COVID19. To develop a web-based information system to manage the coronavirus spreading impacts status and health system situation to enhance the health system's preparedness to facing the pandemic COVID19. This system will enhance the medical staff in Yemen for managing the COVID19 impacts through the methodology of developing a web-based information system for manage COVID19 status in Yemen. This system will help the medical staff monitor the states of coronavirus in each region. Developing an estimation module assists to estimate how COVID19 affect population and common chronic disease and the lack healthcare facility collapse and provide statistical results related to the COVID19 impacts. This will help the medical staff create strategies based on health plans helps to deal with the spreading impacts of COVID19 and provide the essential public health services needed. To update the public citizen of Yemen about the states of COVID19 spreads and awareness to the various information related to COVID19 impacts. The availability of assistive technology allows health officials to prepare and decide medical needs to confront the spread of viruses and to determine the danger of their spread and provide general needs to protect human healthcare.

Keywords: COVID19 In Yemen, Yemen Healthcare, Coronavirus Impacts In Yemen, Web-based Information System

1. Introduction

The risk of major outbreaks of coronavirus in Yemen is very high, given the ongoing war and conflict, political instability and fragmentation, and its weak health system, where only 45% of health

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facilities are completely operational [1]. The situation in Yemen is complicated by the existence of large numbers of migrant refugees and the internal displacement of people, and concomitant outbreaks of communicable diseases such as cholera, dengue and diphtheria, which make Yemen remains the world's largest humanitarian crisis [2]. The COVID-19 outbreak is also disproportionately harming one of Yemen's most critical human resources health workers. Therefore, there are 97 health workers have died because of the pandemic coronavirus epidemiologists, medical directors, midwives, and other critical medical professionals who have died in Yemen reportedly from COVID-19.Therefore, in this uniquely dire context, when one medical professional dies, the effect is exponential and extends to their entire community[3].

The deterioration of the health system in Yemen and the increase in the proportion of chronic diseases such as malaria and cholera. in addition, the high increase of chronic diseases such as diabetes and blood pressure and other diseases as a result of the lack of healthcare system and the readiness of the medical staff for virus vectors such as the current pandemic coronavirus and its spreading impact that affects the people of Yemen in all respects and the inability of the medical staff specialized in inventorying and providing studies and guidelines working to educate society to the impacts of coronavirus led to a bad health's situation. Moreover, the lack of medical plans to be provided by the health department and medical staff that limit the spread of the virus and follow up the movement also activities of the virus spreading addressed, to help on how to deal with the spread of COVID-19 and reduce its impacts and to preserve the health of Yemen's citizens as well as the lacks of providing and gathering information to provide the public community about the dangerous effects by the pandemic COVID 19 spreading to awareness the public [4].

This project, proposed is to develop a web-based information system for COVID 19 in Yemen, this system has developed to manage to track the daily COVID 19 affected cases. In addition, this system is designed to determine the risks of the spreading impact of coronavirus in every city in Yemen according to the percentage of chronic disease and capacity of the health's facility in Yemen. The target user for this web-based information system is open to medical staff. System modules in estimate the COVID19 spreading impacts module, COVID19 tracker module, health care module, hospital status modules and the database module. Medical staff used an estimating module to determine the impacts of coronavirus spreading. In addition, the Medical staff allows monitoring the COVID19 cases in each city in Yemen. The results will assist the medical staff to create health plans to control and avoid the risks situation of COVID19.The rest of the paper is organized into five sections. Next is a literature review, which reviews the existing system and related work in web-based information systems. Part three specifies the methodology chosen for the project development and then the part after that studies the system requirements and design. The last two sections focus on studies of the project implementation, result and testing as well as improvements and recommendations that could be made for this project.

2. Literature Review

Since the spread of COVID-19, in response to pandemics, Yemen's medical staff at Yemen healthcare system has not been able to plan adequate locations for isolation at points of entry into the world, nor has it been able to meet the requirements of the International Health Regulations[5]. Yemen has systemic flaws that have evolved over a protracted period of conflict and bad governance, and it has suffered the most from its health system. The government and the international community should act more quickly now to avoid a complete collapse of Yemen's fragile health system [6].

Considering all the efforts and successes made to mitigate the consequences of the COVID-19 epidemic, the precise distribution of the disease in Yemen has yet to be determined[7]. Challenges remain in the areas of surveillance because of a long-standing dispute in the country, laboratory testing, reporting, community commitment, and case management, the missions also encouraged the adaptation

and creation of the COVID-19, sera-prevalence research protocol to be performed in the province of Aden, which will help classify the percentage of people who had contracted COVID-19 in this region but did not respond to treatment or care facilities in health care, The national COVID-19 task force supported the clinical management protocol and laboratory and testing policy and disseminated these reference documents to all health facilities and partners [8].

The literature review (related work) aimed at conducting activities in the system in accordance with predefined modules to improve the system's effectiveness in order to function better. Research on the comparison of system application techniques is also very important to support and help to create a better system. Studies on existing systems as well as studies on the latest technological developments will usually be undertaken to obtain project-related information.

The comparison with the equivalent system is needed to compare in more detail the web-based development weakness and strengths of the existing system. All the information from the result of the study was used as a guide to improving the development system. Therefore, this study has been carried out on three systems that have some similarities methodology with the development system. Which consist of three systems. Frist, web-based information for the management of ICU beds (critical care units) during the coronavirus outbreaks [9]. Second, a web-based information system for a regional public mental healthcare service network in Brazil [10]. Third, a web Based Information System of Animal Strategic Spreading Disease Using Kano Models [11].

Based on the comparison table between the equivalent system and the proposed system, there are ten main modules compared between each system. In conclusion, the development of a web-based information system for COVID-19 in Yemen takes into account the functions found in the three systems. This comparison is done In order to provide a clearer picture of the system to be developed so that it has features that can meet the needs and wants of users.

Table 1: Comparison between existing systems with proposed system

System Features	A Web-based Information System for the Management of ICU Beds during the Coronavirus Outbreak	A web-based information system for a regional public mental healthcare service network in Brazil	A Web Based Information System of Animal Strategic Spreading Disease Using Kano Models	Web-Based Information System for COVID-19 in Yemen
Purpose	Identify the healthcare facility ICU beds availability in the country	Enabling detailed patient information sharing active coordination of the processes of psychiatric admissions and discharges.	Identify the spread of contagious animal disease strategically	Identify the COVID19 spreading impacts into specify city/Area in Yemen

Table 1: (Cont.)

Functions	To obtain the number and percentage of free, occupied, and blocked hospital beds in real-time	The main current limitation of the SISAM-13 is that it is mostly used only to manage the interface between hospital and community services (i.e. hospitalizations and discharges	The system developed to assist the officers in determining the priority locations of disease prevention and prevention activities in the form of treatment policy	To monitoring the COVID19 spreading impacts status in each city to estimate the spreading risks of COVID19 into each city in Yemen
Techniques for Implementation	Spring Framework	NetBeans platform framework	prototype development	prototype development
System Targets	The administrator of the state health department and the health professional linked to health units	The administrator of the state health department and the health professional linked to health units	The administrator of the state health department and the health professional linked to health units	The medical staff at the health Department and the Public Citizen of Yemen
Graph and report	Does not produce a graph but produce a report.	Does not produce a graph but produce a report.	Does not produce a graph but produce a report.	Does produce a graph and produce a report

3. Methodology

The research methodology is the systematic way of method applied at the field of study that used to analyze or collect data in a research. In the information system field, the research methodology called system development methodology. A system development methodology refers to the framework for structuring, planning and controlling the development of an information system. There are several types of system development methodology which is not suitable for use by all development projects. Each of the available methodologies is suited to a specific project based on attentive, accurate and selective considerations. The dataset was collected from hospitals in Yemen namely, Al Thawra Modern General Hospital, Republican Hospital and Al Sabeen Maternal Hospital. The dataset consists of patients from all over Yemen. The shape of the dataset is 12,1000 as the features as it showed below:

1. Infected with COVID19
2. Died from COVID19
3. Recovered from COVID19

4. Confirmed cases
5. Unconfirmed cases
6. Chronic diseases (class)
7. Infected with the pandemic outbreak
8. Health system capacity
9. Hospital name
10. City
11. Age>60
12. Population

3.1 Prototype Methodology

The appropriate methodology is helpful to ensure that every work carried out can produce something good and organized. The development of this project will use the approach found in the System Development Life Cycle (SDLC), which is to use a prototype model. Prototype methodology is a methodology that allows system users to interact directly with the system as a testing ground for the system. The main purpose of the prototype model was chosen as a methodology strategy in developing a web-based information system for COVID 19 in Yemen because it can be repeated phase is possible to meet the needs of users over time and at the same time, the components of the project can be improved continuously. There were four phases involved in this model name the Planning phase, Analysis phase, Design phase, and Implementation phase. The phases in this prototype model describe the methods, tools, and procedures that will be used to build a system [12]. The prototype model can be referenced in figure 1 below.

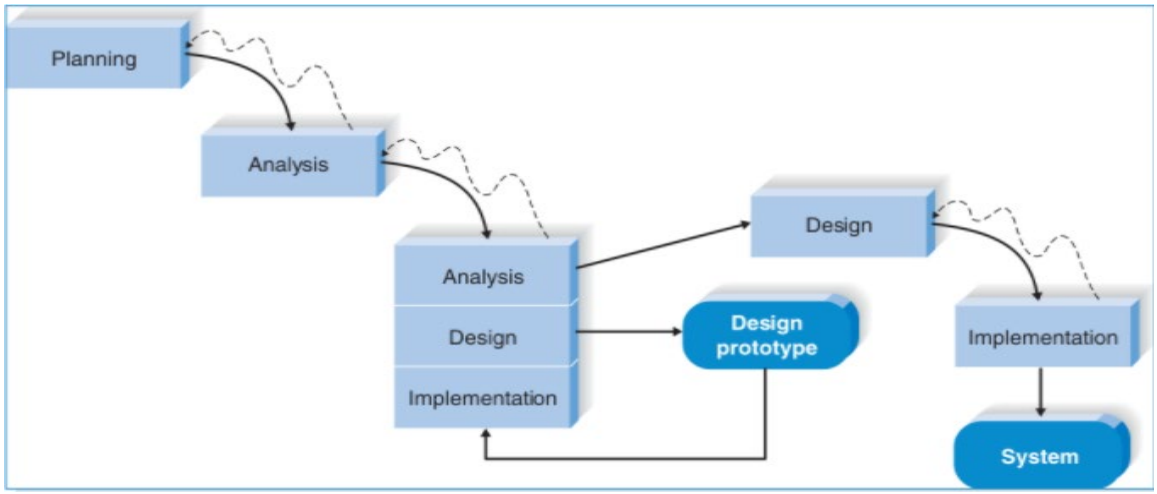

Figure 1: Prototype Development Methodology

3.1.1 Planning Phase

A systematic planning was also being conducted in order to ensure the activities that carry out during developing the project will be systematic manner. Thus, a Gantt chart was developed as a guideline for the task that must be carried out. Gantt chart was designed to ensure that the system. Will

develop smoothly. Each activity is assigned a time and each of this activity should be completed in time given time.

3.1.2 Analysis Phase

Structured approach (System Analysis and Design) was used in this project. Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD) of web-based information system for COVID19 in Yemen will be created in this phase. Data flow diagramming is a technique that diagrams the business processes and the data that pass among them. An entity relationship diagram (ERD) is a picture which shows the information that is created, stored, and used by a business system.

3.1.3 Design Phase

The system architecture was implemented by analysing the data and process models that have been determined in the analysis phase. Sketches system was initiated in the early stages of design. Interface design and database of the system can be illustrated more clearly in the modelling entity relationship diagram (ERD) and flowchart. Data Flow Diagram (DFD) is generated so that the system can be developed to fulfil the scope and objectives that have been set in the planning phase. Furthermore, the database of the system was designed carefully so that it is compatible with the input and output designed in the system interface. This database is developed according to suitability and requirements of the system. In this project, MySQL will be used in designing the database. The system interface design and database design will be used as a guideline when implements the prototype.

3.1.4 Implementation Phase

In this phase, the source code will be made to allow the proposed system can be tested by users of the system. Among the activities involved in this stage are to test the database, programming, module testing and system testing. The database will be tested by ensuring that data can be accessed from the database. Whereas, testing of the program was conducted to ensure that the program built without any problems. Module testing is done to test the functionality of each module. The system testing is needed because it involves the users of the system. A web-based information system for COVID19 in Yemen will be implemented by using programming language which is hypertext Preprocessor (PHP). When the prototype is done, it will be evaluated by user (medical staff). If the system does not meet the requirements of users and needs to be repaired, process improvements will be made.

3.2 System Analysis and Implementation

The Analysis and Design phase is the process implemented in the planning and design of the web-based information system for manage COVID-19 in Yemen which will be developed before implementing the system. The information and data obtained will be analyzed to study and research the system to be developed. The identifiable analytical results are the project requirements, which defines the goals, objectives, scope of the project, and also the importance of the project. Design is a system designed based on object-oriented design strategies. Therefore, the results of the analysis and design make the system more attractive. The Analysis phase is an important process for knowing the specifications in more detail to ensure that the system being developed meets the system requirements of the user

3.2.1 System Flowchart

This flowchart is an overview of the journey for medical staff, public citizens of Yemen of the system. Through this flow chart, system developers can understand system requirements. This process involves all users who use this system and the process that each user must go through this system. COVID-19 Yemen Web-based system can be described its components processes, input, outputs, and

options. [Appendix A: figure 2]. Illustrate the process of Public users involved to go through using the web-based information system, which describes the public citizen process from the start to the end. [Appendix A: figure 3]. Illustrate the process of the medical staff involved staff go by using the web-based information system, which describes the medical staff process from the start to the end.

3.2.2 Context Diagram

The context diagram is a diagram that consists of a process and describes the scope of a system, the context diagram is the highest level compared to Data Flow Chart which represents the entire input to the system or output from the system. The context diagram gives an overview of the entire web-based information system. Within this system are two entities consisting of public users and medical staff involved in this system. [Appendix A: Figure 4] shows the context diagram structure that describes the entities and process involved into a web-based information system for COVID 19 in Yemen

3.2.3 Data Flow Diagram

The data flow diagram describes in detail the process and the entities involved in the web-based information system. Based on the data flow diagram shown in [Appendix A: Figure 5] there are two entities namely the public citizen and medical staff the data flow diagram describes each entity and its process in the web-based information system for managing COVID impacts in Yemen.

3.2.4 Entity Relationship Diagram

The entity-relationship diagram describes the entities and attributes involved in the web-based information system for manage COVID19 in Yemen. [Appendix A: Figure 6] shows in detail the entities and attributes involved in the entity-relationship diagram. In this system there are two entities involved which are the Public citizen and medical staff, each entity is related to each other.

4. Result and Discussion

This section presents the results obtained in terms of designing a web-based information system for COVID 19 in Yemen. Specifically, the results divided into several pages, this web-based information system conducted by PHP, HTML as the programming language and MySQL as the database. The results of this project is a web-based information system used to help medical staff in Yemen to manage and to estimate the spreading impacts of corona virus into a specific area and to make public citizen in awareness to the COVID 19 status and city conditions.

4.1 Interface Design

Interface design is concentrates on looks, style, and designs of web pages. Interface design is created to show how the actual user interface will looks like. An interface should be easy and convenient to use. Figure [7] to Figure [21] shows the web-based information system for COVID19 in Yemen Interface design.

4.1.1 COVID19 Yemen web-based interface

The COVID-19 Yemen website is developed to display the daily corona virus cases in Yemen, and to display the spreading impacts of corona virus in each city. COVID-19 YE is the General website for every Public citizen in Yemen to view the statistical results of COVID-19 daily reports that control by the medical staff in Yemen. Figure 7 shows the interface for the COVID-19 Yemen website

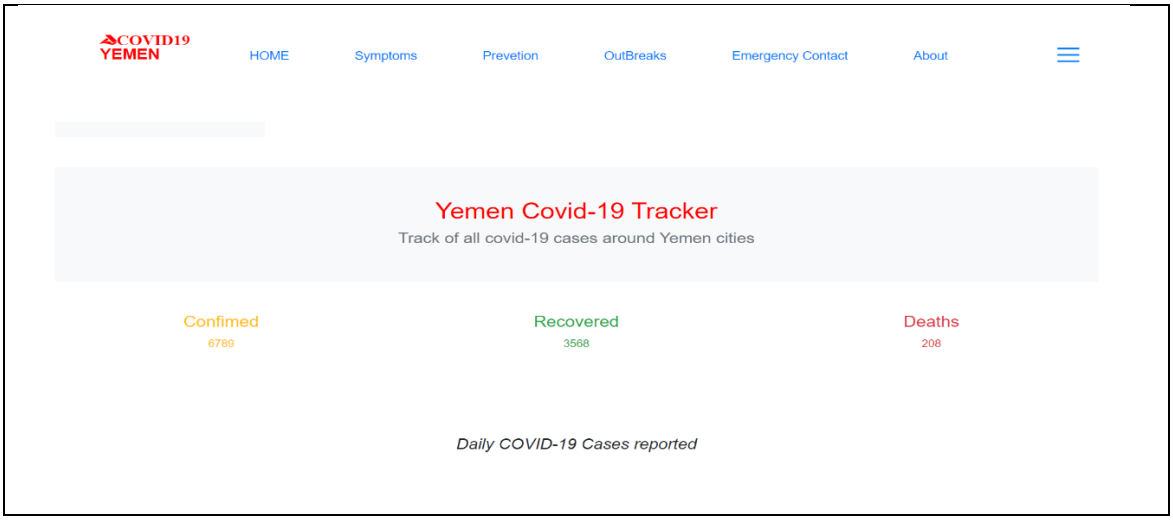

Figure 7: COVID 19 Yemen Web page Interface

4.1.2 Home page for COVID19 YE Interface

The home page displays the daily reports of coronavirus in Yemen as total cases and in cities as individual reports by the medical staff at Yemen for this daily (confirm & recovery &deaths & total case overall) in each city in Yemen. Figure 8 shows the home page interface in COVID-19 Yemen website.

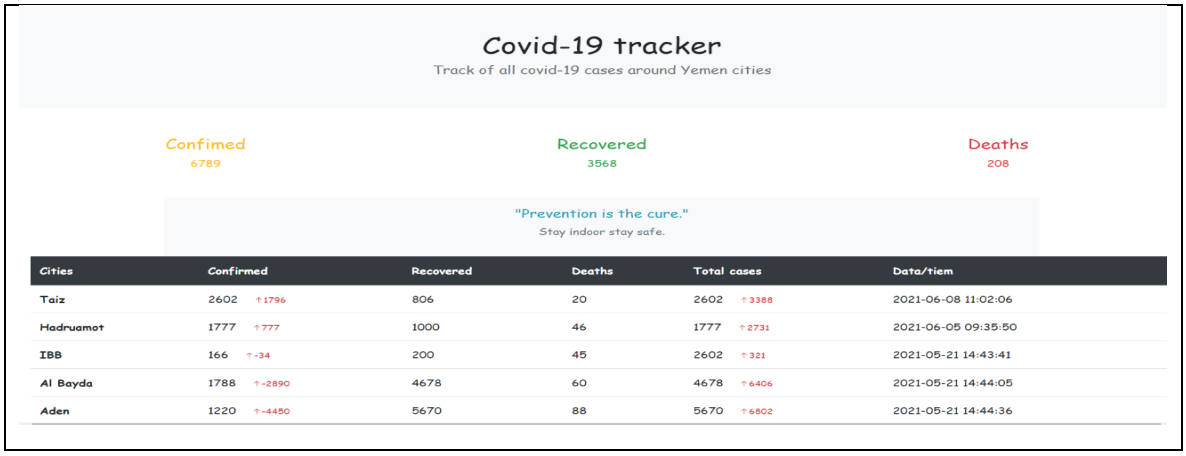

Figure 8: The Home page Interface

4.1.3 Emergency Contact Interface

Emergency contact act as an intermediate connection between public users and medical staff at Yemen health Centre. The public user/ citizen of Yemen can enter their personal information and health status description. This information directly sends to the medical staff page. Figure 9 shows the emergency contact interface.

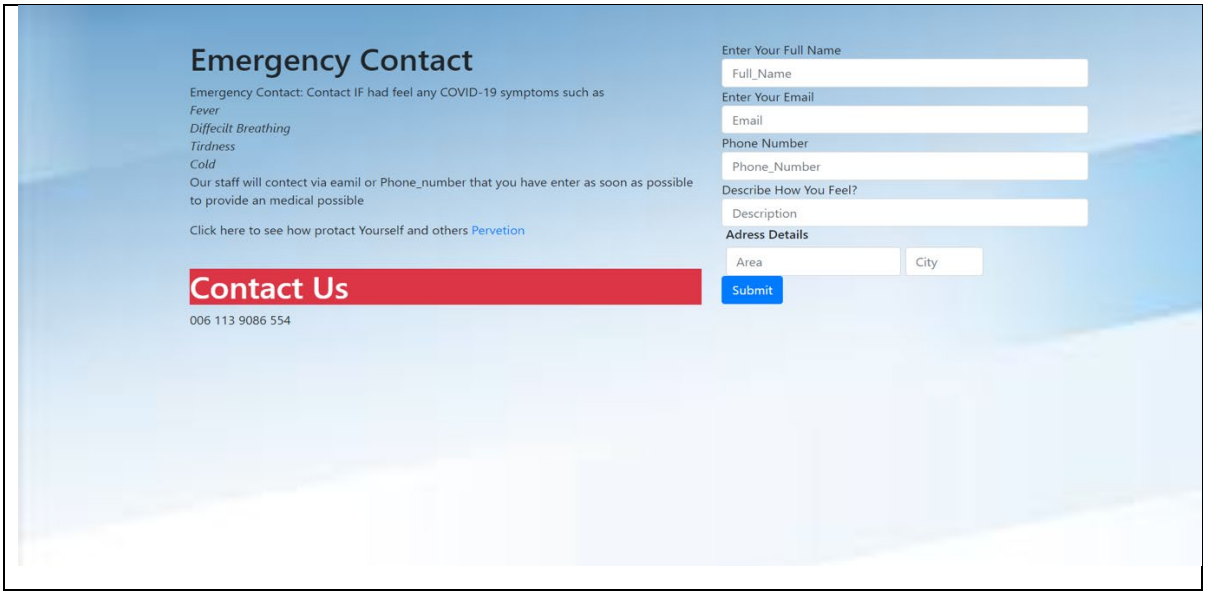

Figure 9: Emergency Contact Interface

4.1.4 Medical Staff login page Interface

This module act as an intermediate between the staff and the system. The staff must sign in before accessing the system. The information needed to access this system is the staff's username and password. Figure 10 shows the medical staff's Login page interface.

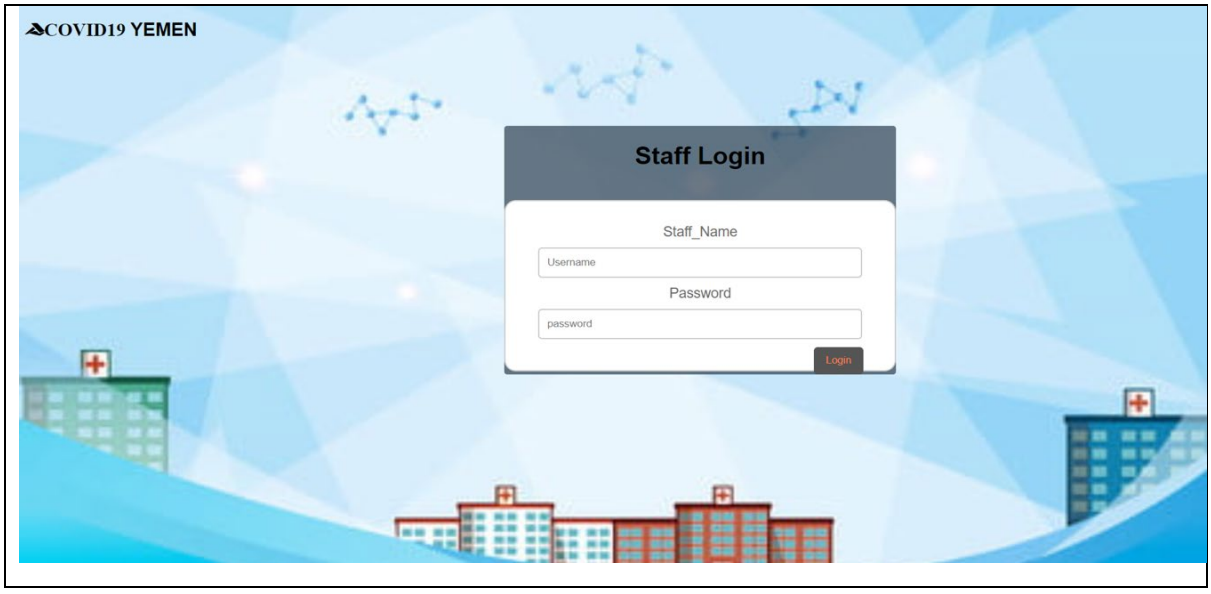

Figure 10: Medical Staff Login Interface

4.1.5 COVID19 Tracker Management Interface

This module allows Medical staff to manage the COVID-19 tracker information and record such as confirmed cases, recovery cases, and total cases and deaths cases in each city. This module allows the

medical staff to track the daily reports cases in each city such as updating, adding and removing any list of the city record. Figure 11 shows the COVID19 Tracker Management interface.

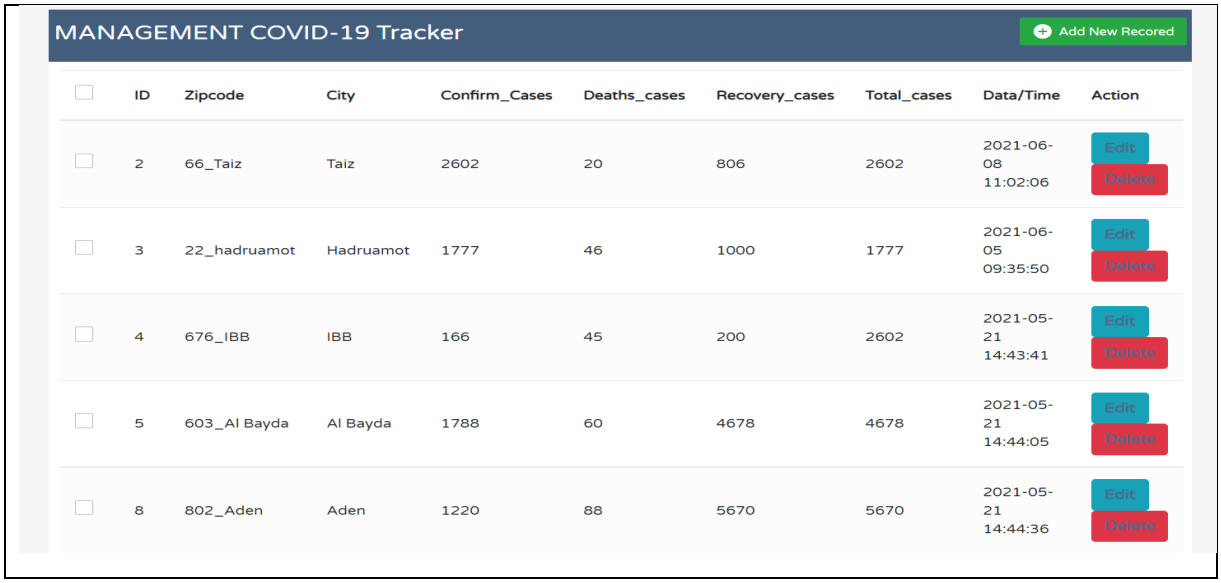

Figure 11: COVID 19 Tracker Interface

4.1.6 City information & Status Management Module

This module allows medical staff to manage the city information such as updating, adding and removing a list of city health condition status. In this module, medical staff can manage the following information related to every city database recorded such as Name of the city, population, number of diabetes patients, and number of Blood pressure, number of Respiratory patients, and number of hospitals, number of Doctors and total of staff in every city hospitals. [Figure 12] shows the City condition status and Information Management Interface

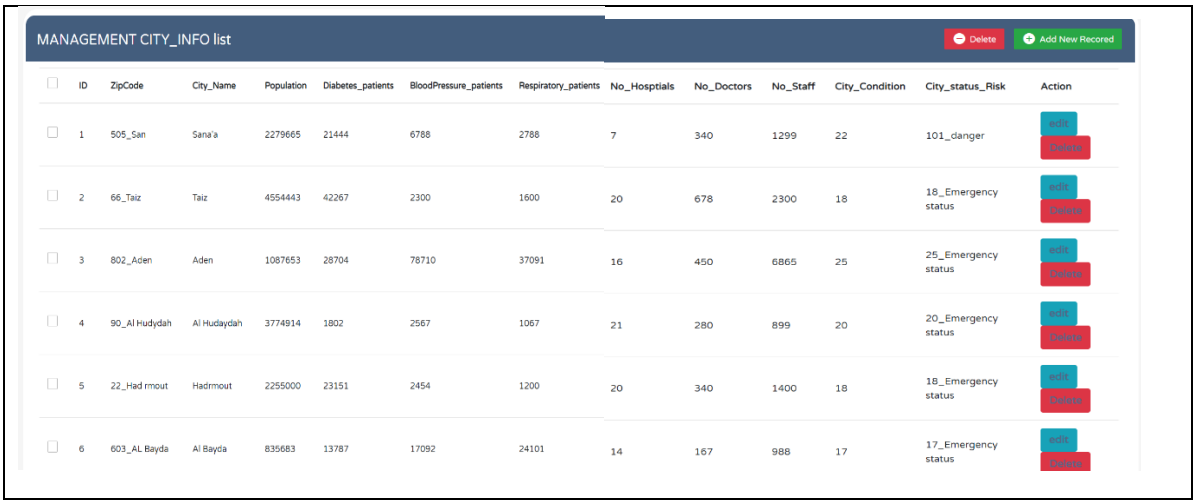

Figure 12: City M Health Management Interface

4.1.7 City Outbreaks Management Module

This module allows medical staff to manage the city information such as updating, adding or removing a list of any city information in the system. The information will be entered by medical staff such as Cholera and Dengue cases infected in every city in Yemen. [Figure 13] shows the City Outbreaks Management Interface.

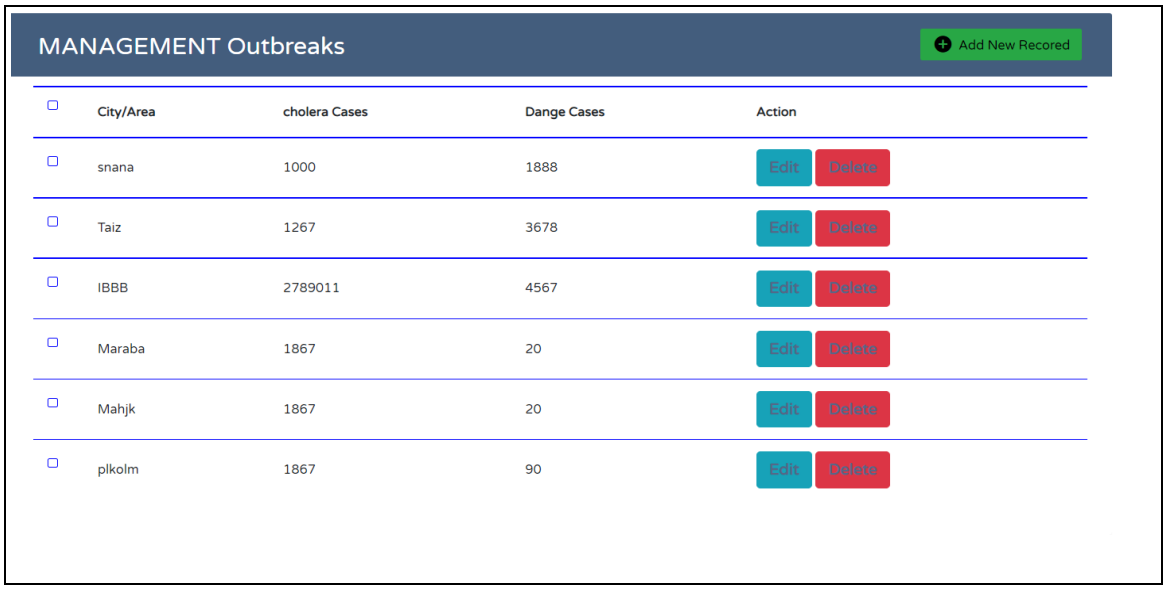

Figure 13: City Outbreaks Interface

4.1.8 Hospital Information Management Module

This module allows medical staff to manage hospital information such as updating, adding and removing any hospital record and status such as hospital name, a total of beds, available beds, number of respirators and hospital status(available/ unavailable) in the system. Figure 14 shows the Hospital information Management Interface.

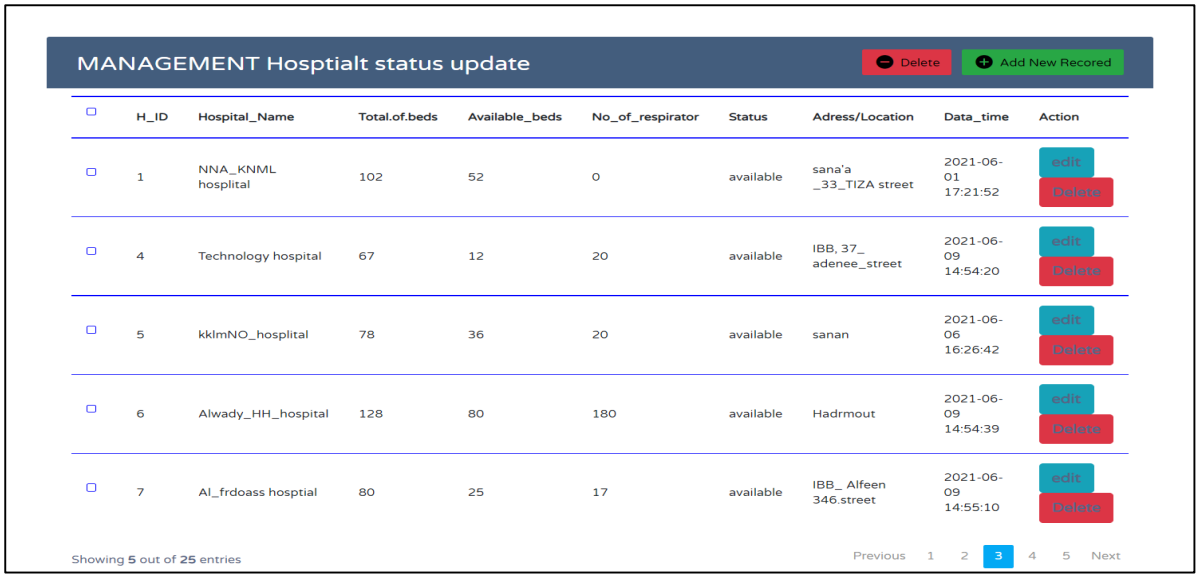

Figure 14: Hospital Management Interface

4.1.9 City Condition Status Estimator Management module

This module allows medical staff to manage the cities information such as Name of city, population, number-diabetes patients, and number of Blood pressure, number of Respiratory patients, and number of hospitals, number of Doctors and total of staff in every city hospital. Therefore, entering Risks status results getting from the Estimator module above, the activities are taken in this model by medical staff such as updating, adding or removing a list of any city information in the system. The module is based on a sample mathematical equation which use the data status to estimate the risk of the spreading of coronavirus into the specific city in Yemen. Figure 15 and16 shows the Estimator Management Interface.

Figure 16 shows the statistical chart which displays each city status of the spreading of coronavirus into each city. In addition, this chart is limited with 25 % as the major rate of city risk/health's status the results status that if (1-9 % Normal status) if (9-15 % Dangerous status) and if (15-25 Emergency status) based on this results in the medical staff are aware to the city health conditions for future preparedness to control the spread of COVID19.

CITY	POPULATION	Age (60 or more)		Diabetes		Blood pressure	
		Number	(%)	No. patients	(%)	No. patients	(%)
Aden	1087663	91927	8%	28704	3%	78710	7%
Al Bayda	835683	13787	2%	17092	2%	24101	3%
Al Mahrah	400000	4230	1%	2444	1%	1244	0%
Al Hazm	18241	3642	20%	1242	7%	1000	5%
Al Hudaydah	617871	118233	19%	20023	3%	41023	7%
Al Jabin	89775	2340	3%	2000	2%	602	1%
Al Mahwit	732360	21231	3%	1023	0%	2999	0%
'Amran	1123651	30001	3%	6000	1%	675	0%
Shabwah	651509	23452	4%	3456	1%	4033	1%
Bajil	48218	10334	21%	7000	15%	8920	18%
Bayt al Faqih	34204	11033	32%	2300	7%	2000	6%
Dhalie	114760	6540	6%	2000	2%	2000	2%
Dhamar	1697067	60234	4%	2000	0%	1672	0%
Dhi as Sufal	37997	1099	3%	1666	4%	1000	3%
Hadibu	8545	2333	27%	2000	23%	540	6%
Hajjah	43549	3066	7%	6000	14%	2001	5%
Ibb	3911070	60234	2%	7240	0%	4000	0%
Jadder Cemetery	100002	2356	2%	560	1%	700	1%
Jawf al Maqbabah	14175	5066	36%	1000	7%	820	6%
Lahij	926291	5420	1%	234	0%	655	0%
Ma'rib	504696	1202	0%	650	0%	500	0%
Mukalla	258132	10443	4%	20150	8%	6000	2%
Sa'dah	51870	12033	23%	6027	12%	1000	2%
Socotra	60000	1000	2%	6025	10%	1022	2%
Sanaa	1937451	201340	10%	206570	11%	76000	4%
Sayyan	69404	10234	15%	2000	3%	7000	10%
Ta`izz	4554443	120345	3%	6026	0%	2067	0%
Yarim	33050	12340	37%	4501	14%	2088	6%
Zabid	52590	1023	2%	2999	6%	6001	11%
Abyan	658824	5432	1%	2340	0%	1022	0%

No.of .Respirator			City condition	Risk ratio	No.of.Doctors	No.of.Nurses	No.of.beds			Total Risk
Total	Available	Available (%)					Total	Available	Available (%)	RISK
72	64	89%	22%	22%	753	6865	204	54	26%	0.000248926
45	32	71%	16%	16%	32	978	123	60	49%	0.00011084
40	23	58%	12%	12%	267	1235	86	55	64%	0.001142676
25	20	80%	24%	24%	222	879	67	35	52%	0.002692534
66	40	61%	18%	18%	222	879	67	35	52%	0.002692534
23	15	65%	15%	15%	222	879	67	35	52%	0.002692534
45	24	53%	11%	11%	222	879	67	35	52%	0.002692534
20	10	50%	11%	11%	222	879	67	35	52%	0.002692534
14	8	57%	12%	12%	222	879	67	35	52%	0.002692534
14	7	50%	22%	22%	222	879	67	35	52%	0.002692534
28	15	54%	21%	21%	222	879	67	35	52%	0.002692534
32	20	63%	15%	15%	222	879	67	35	52%	0.002692534
24	16	67%	14%	14%	222	879	67	35	52%	0.002692534
21	10	48%	13%	13%	222	879	67	35	52%	0.002692534
50	23	46%	25%	25%	222	879	67	35	52%	0.002692534
52	32	62%	18%	18%	222	879	67	35	52%	0.002692534
56	20	36%	8%	8%	222	879	67	35	52%	0.002692534
51	40	78%	17%	17%	222	879	67	35	52%	0.002692534
39	20	51%	23%	23%	222	879	67	35	52%	0.002692534
61	42	69%	14%	14%	222	879	67	35	52%	0.002692534
40	21	53%	11%	11%	222	879	67	35	52%	0.002692534
45	26	58%	15%	15%	222	879	67	35	52%	0.002692534
45	20	44%	17%	17%	222	879	67	35	52%	0.002692534
40	31	78%	19%	19%	222	879	67	35	52%	0.002692534
122	66	54%	16%	16%	222	879	67	35	52%	0.002692534
29	19	66%	19%	19%	222	879	67	35	52%	0.002692534
92	40	43%	9%	9%	222	879	67	35	52%	0.002692534
46	27	59%	24%	24%	222	879	67	35	52%	0.002692534
35	24	69%	18%	18%	222	879	67	35	52%	0.002692534
40	29	73%	15%	15%	222	879	67	35	52%	0.002692534

Figure 15: Yemen Health Estimator Module Interface

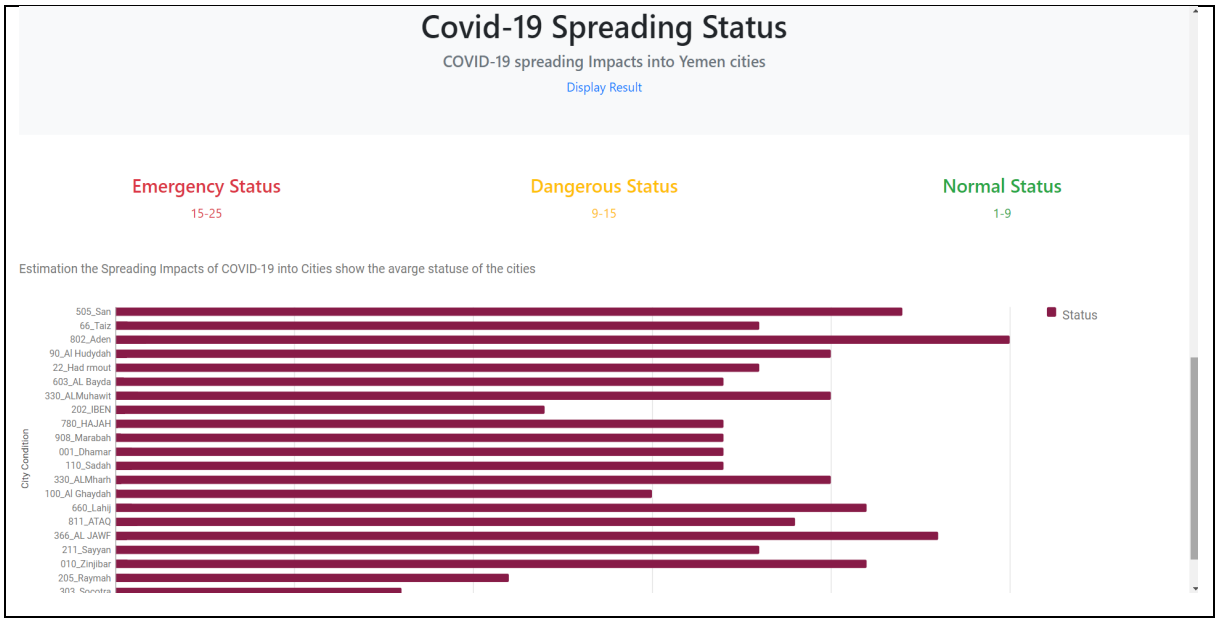

Figure 16: Yemen Health Estimator Module Interface

4.1.10 Generate a COVID-19 Reports

This module generates daily reports of coronavirus in Yemen cities, in addition, the status reports of each city condition status according to the spreading of the pandemic coronavirus. Figure 17 shows the daily coronavirus cases reported in form of a Column chart. While. Figure 18 shows the health status of city condition based on chronic disease patients in Yemen.

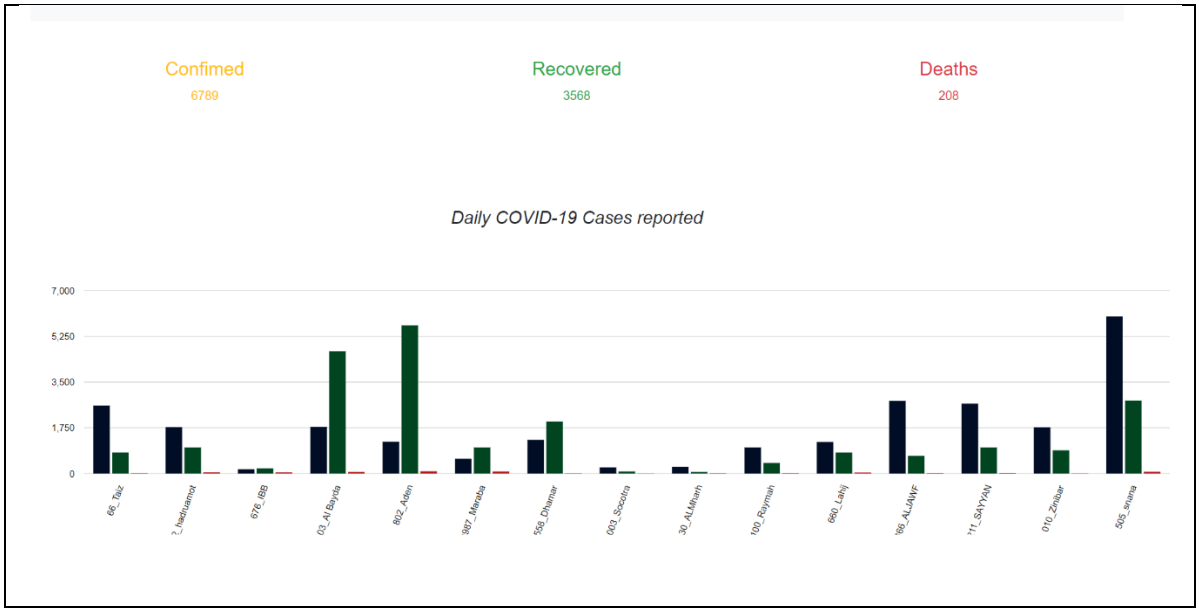

Figure 17: Daily COVID19 reports Generated Module Interface

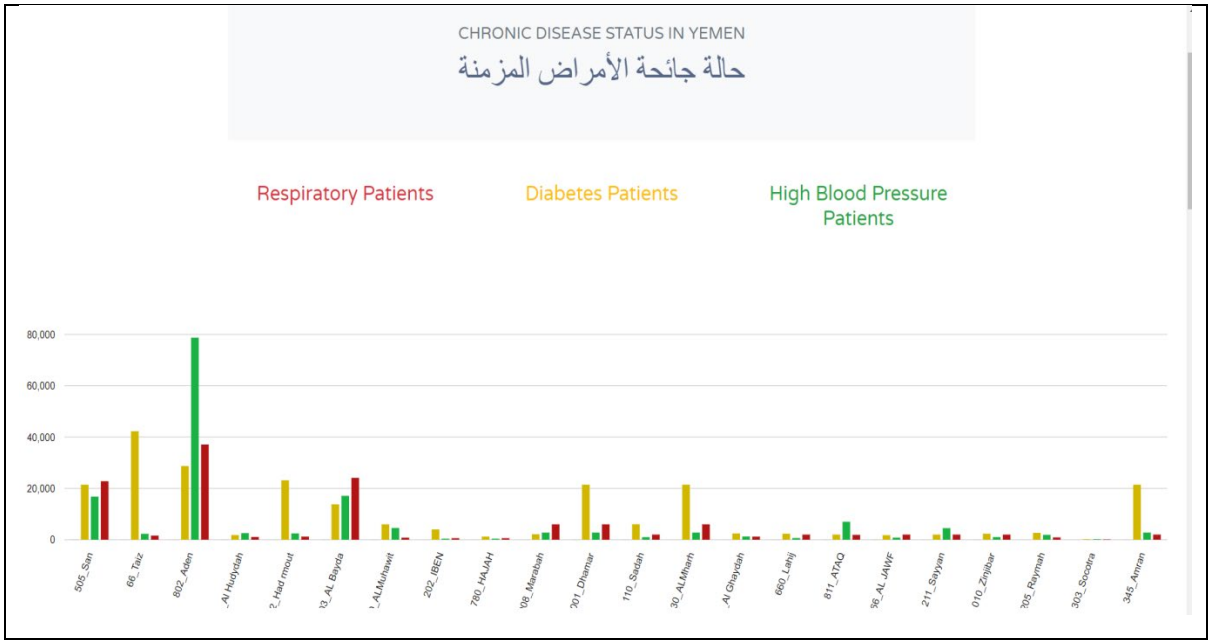

Figure 18: City Condition reports of Chronic Disease Patients

4.2 Functional Testing

Functional testing is a type of black box testing which treats the system as "black box", examining the system functionality without deal with the internal system implementation and is a specification-based testing. The system testing was conducted during alpha phase by the developer based on requirements. Table 2 will show the functionality testing of the web-based information system modules.

Table 2: System Functionality Testing Modules of Web-based Information system for COVID19 in Yemen

Test Cases	Modules	Description	Output
TEST_100	**Module Name**	**Expected Result**	**PASS/FAIL**
TEST_100_001	Medical Staff login	System identify the staff valid information and allows to login	pass
TEST_100_002	Update Medical staff INFO	Main admin can update staff information.	pass
TEST_100_003	COVID-19 Tracker Management Module	The medical staff are able to Monitor coronavirus daily cases. This module is generate a daily reports of COVID 19	pass

Table 2: (Cont.)

TEST_100_004	COVID-19 Yemen Total Cases Management Module	The medical staff can manage the total cases record in Yemen	pass
TEST_100_005	City Outbreaks Management Module such as (Dengue , cholera , malaria)	Enable medical staff to monitor each city outbreaks pandemic and provide daily reports.	pass
TEST_100_006	Hospital Management Module	The medical staff are enable to edit each hospital status according the hospital capacity available.	pass
TEST_100_007	Public Emergency Contact	Enable public citizen to create contact with staff for an any emergency health status related to Coronavirus	pass
TEST_100_008	CURD Module in COVID-19 YE website Modules	System functionality can be update, added and deleted.	pass
TEST_100_009	City Condition Status Estimator Management module	This module determine every city Status based on the spread of coronavirus This unit are collection of data such city population, population with ages >60, city patients of chronic disease, and the health system capacity such as No- of hospital, No- of Doctors, No- of Nurse & staff	Pass
TEST_100_010	Generate a COVID-19 Reports	Reports can generated effectively for each module as daily status reports	pass

5. Conclusion

The COVID-19 Yemen web-based information system is a system developed for the Yemen health's Centre (The exporters in Disease Infections) at the Yemen health department. The purpose of the system was to address the problem arising in the current pandemic coronavirus (COVID-19) spreading impacts in Yemen and to estimate the risk of each city according to the health facility and chronic disease patients in Yemen which give statistic results that determine the risk of each city. The user who is allowed to use the system is the medical staff responsible for managing the system and monitor the daily coronavirus cases all over Yemen cities and providing a daily report about the COVID19 cases and health system status for each city as social awareness to the citizen. As a result of the system testing, all modules work functionally well this system successfully solved all the problems states for this project and have achieved its objectives.

Acknowledgement

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support and encouragement throughout the process of conducting this study.

Appendix A

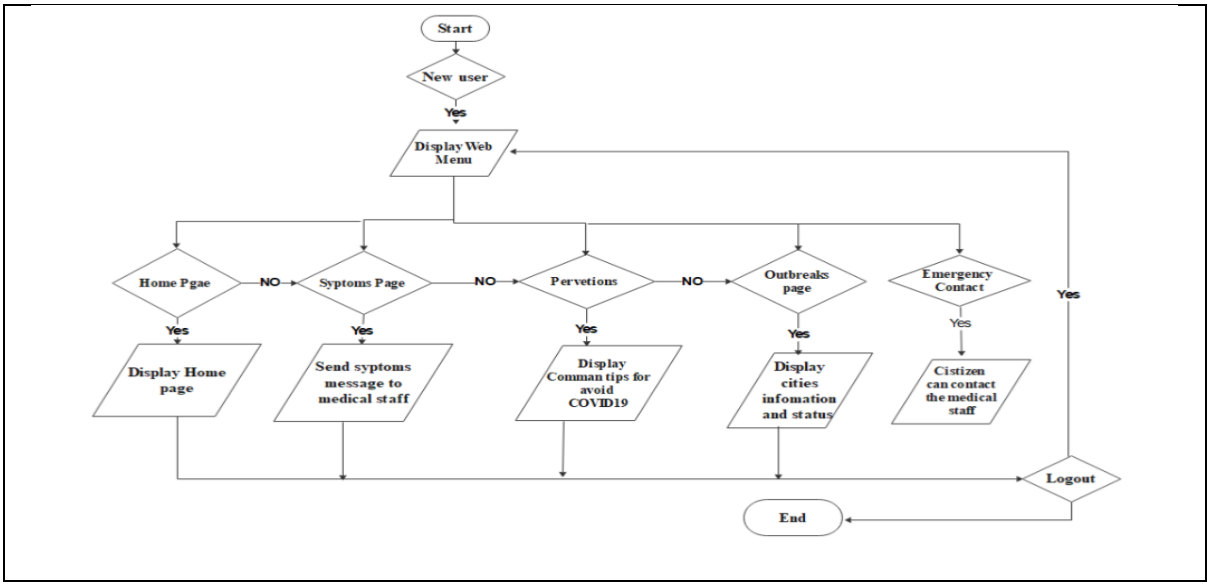

Figure 2: Public Citizen Flowchart

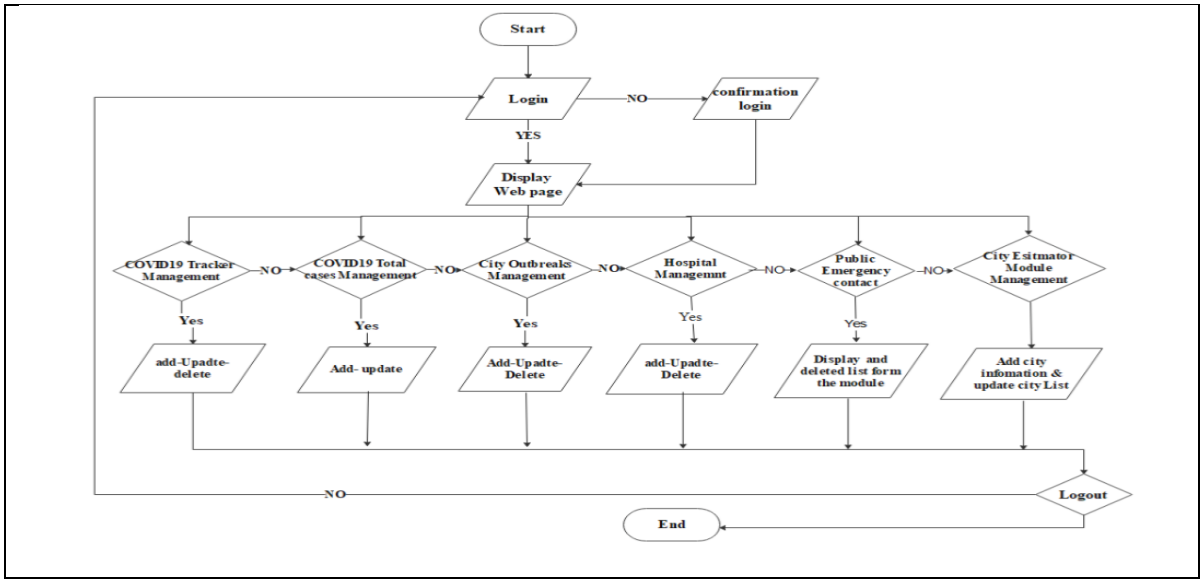

Figure 3: Medical staff Flowchart

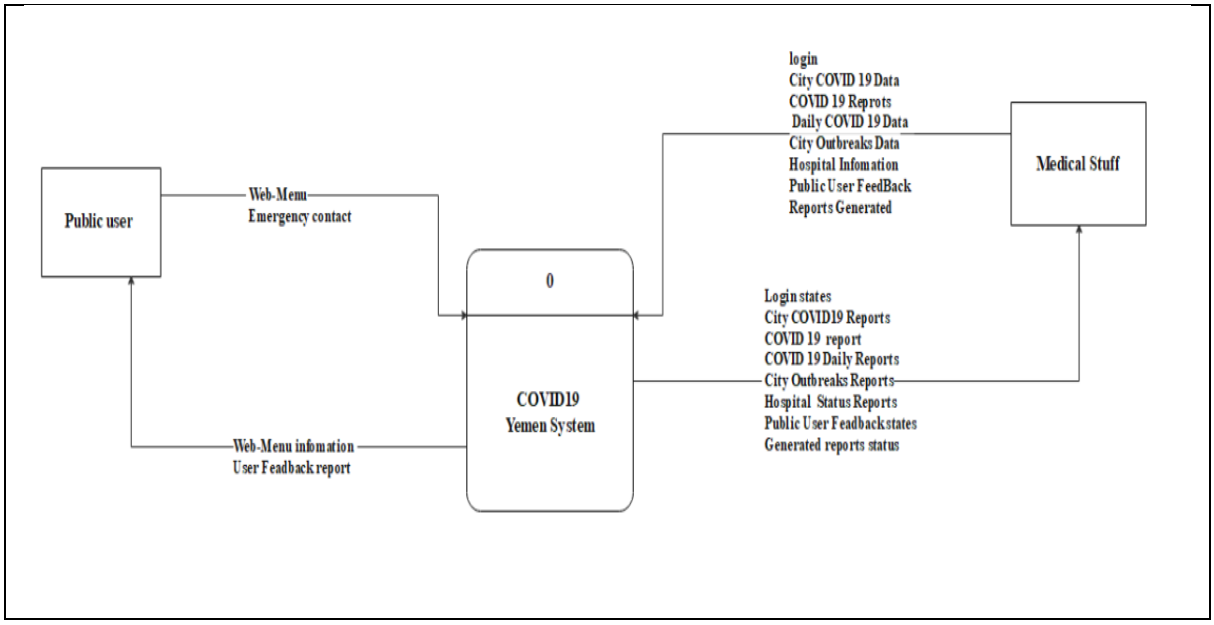

Figure 4: Context diagram

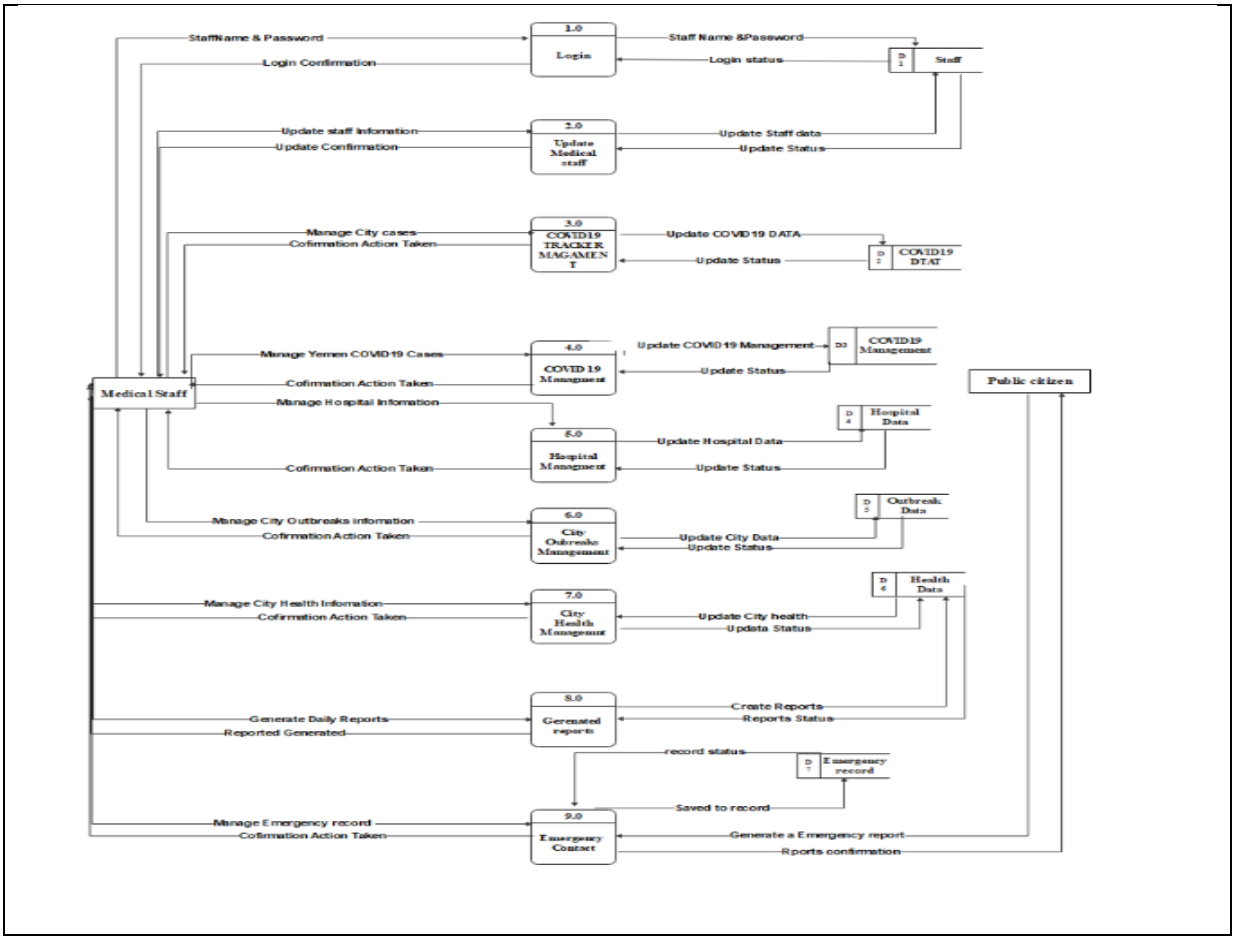

Figure 5: Data Flow Diagram for Web-based information system for COVID 19 in Yemen

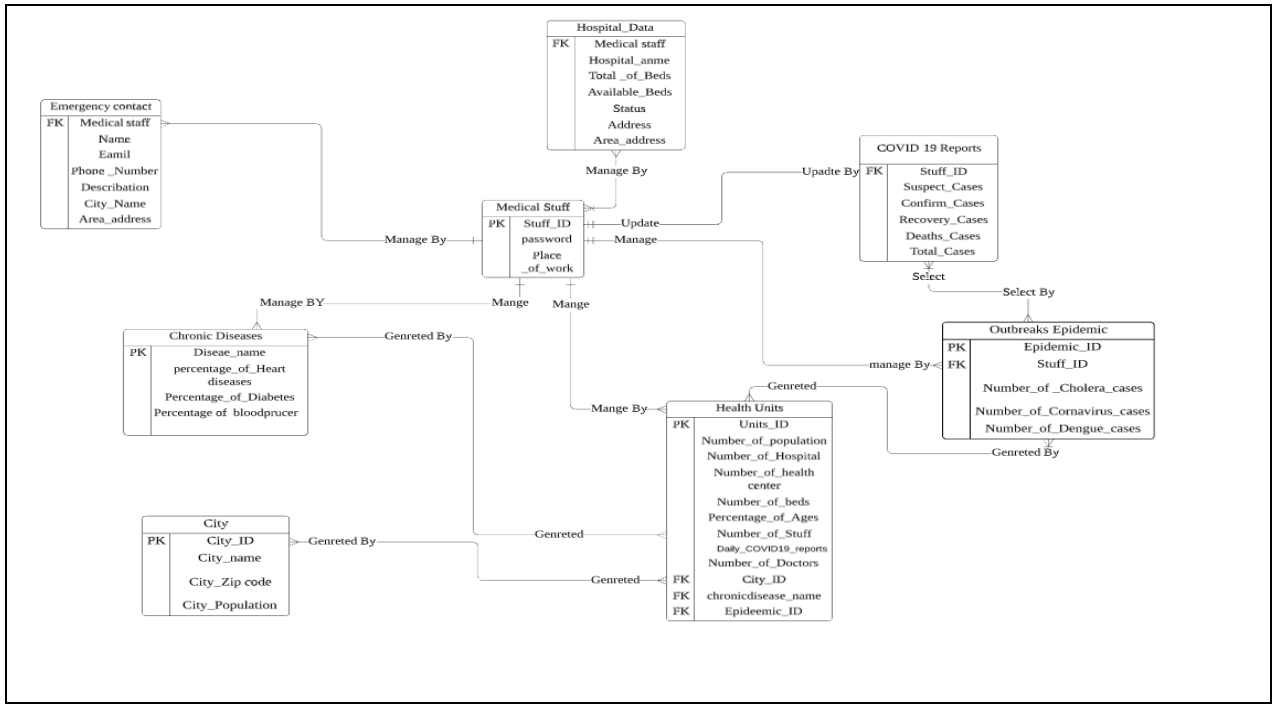

Figure 6: Entity Relationship Diagram for Web-based information system for COVID 19 in Yemen

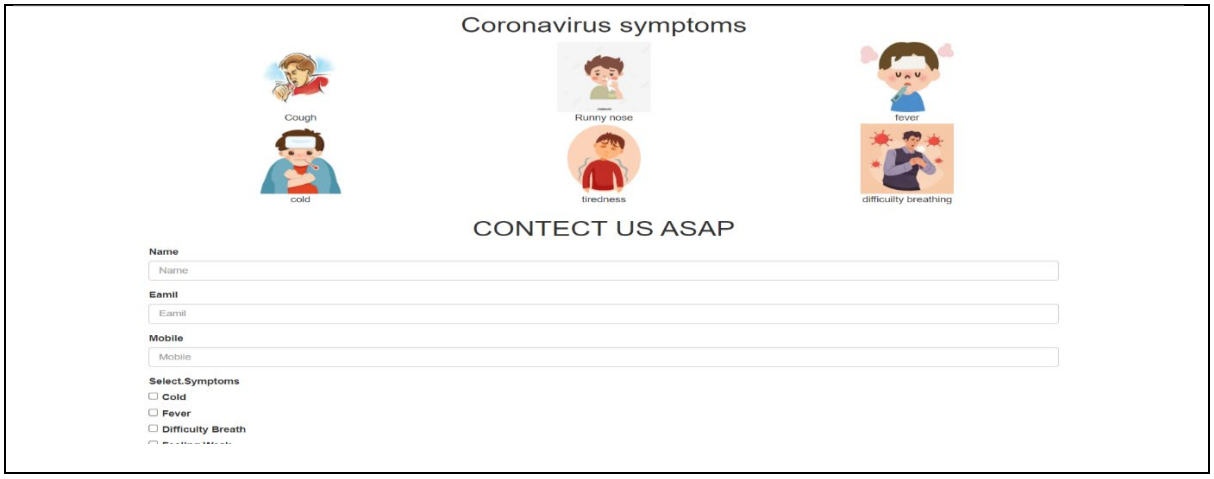

Figure 19: Symptoms Page interface

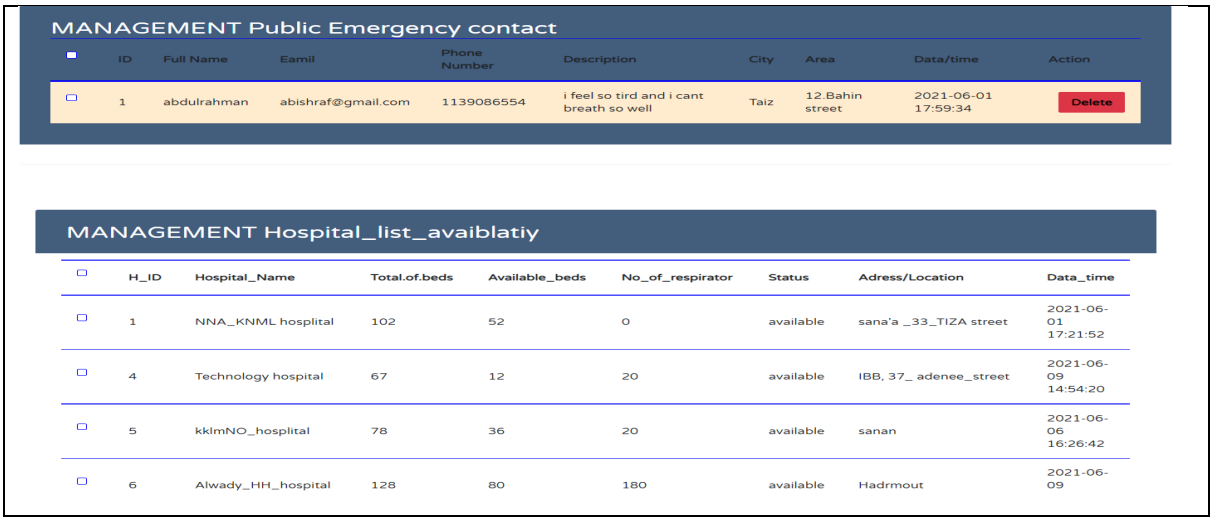

Figure 20: Public Emergency Contact Feedback Interface

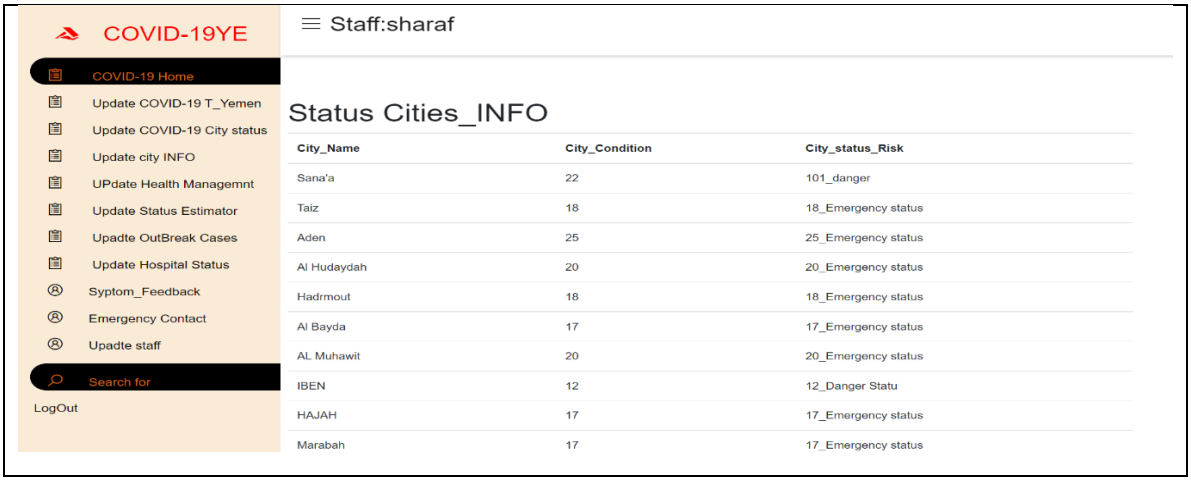

Figure 21: Medical staff Management Home Interface

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