

## CovidTracker Sprint 2

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## 1.0 INTRODUCTION

The purpose of this document is to give an overview of the problem, proposed solution, statement of scope, project description, product requirements, summary of work packages completed in sprint 2, a sprint 3 release plan, software architecture, risk assessment and management plan, user interface design, testing plan, defect tracking, and quality measurements. This document is targeted at all stakeholders of the system: product owners and development team..

### 1.1 Positioning

#### 1.1.1 Problem Statement

The problem of	Lack of an easy to use tool to track, manage and coordinate the onset of positive COVID-19 patients on both a micro and macro level.
Affects	Patients, Doctors, Health Officials, Immigration Officers
The impact of which is	The inability for the government to properly handle and manage COVID-19 variants, hospital capacity and perform a safe reopening plan backed by data and science.
A successful solution would be	<ul style="list-style-type: none"> <li>- A way to assign quarantine restrictions to positive COVID-19 patients</li> <li>- A way to monitor the status and symptoms of confirmed and unconfirmed patients with COVID-19</li> <li>- Conduct contact tracing notify the people with whom COVID-19 patients have been in contact</li> <li>- Allow patients to update their COVID-19 status and symptoms</li> <li>- An easy way to arrange appointments between doctors and patients</li> </ul>

Table 1: Problem Statement

### 1.1.2 Product Position Statement

For	Patients, Doctors, Health Officials, Immigration Officers and Administrators
Who	Manage, monitor and respond to COVID-19 related events and situations
CovidTracker	Is a responsive web application
Unlike	Covid Alert, ArriveCan
Our product	Is designed to ease the management and monitoring of COVID-19 across the province by contact tracing and notifying patients positive with COVID-19, allowing doctors to follow patients symptoms and arrange appointments with positive patients, assign quarantine restrictions and allowing patients to daily update their status and symptoms.

Table 2 : Product Position Statement

## 2.0 PROJECT DESCRIPTION

The project has a couple of main lenses where all features are derived from such as patient management, status report management, contact tracing, a messaging system, a notification system, a QR code system, and a detailed authentication and authorization layer in front of the system to make sure sensitive info is not shown to the wrong user.

Agile is an iterative software development methodology allowing software teams to produce working software quickly, test it, get feedback on it, and then iterate in quick cycles. Agile is being used given its methodology and to ensure that the product owner's needs -progress and requirements - are being satisfied by the development team throughout the project development lifecycle.

Development is broken down into 5 total sprints and the schedule will be as follows:

Sprint	Date (mm/dd/yyyy)
1	1/12/2022 - 2/2/2022
2	2/3/2022 - 2/23/2022
3	2/24/2022 - 3/16/2022
4	3/17/2022 - 4/6/2022
5	4/7/2022 - 4/18/2022

Table 3: Sprint Schedule

## 2.1 Stakeholders

Project stakeholders consist of users, the development team and project owners. The various roles assigned to each user, development team member and project owners are as follows and subsequently described in the following section.

- Users
  - Patients
  - Doctors
  - Health Officials
  - Immigration Officers
  - Administrators
- Product Owner
  - Yann-Gaël Guéhéneuc
  - Minani Jean Baptiste
- Project Champion
  - Jason Gerard
- Organizational Management Team
  - Andre Ibrahim
  - Ejazali Rezayi
  - Dan Raiu
  - Daren Kafafian
  - Domenic Seccareccia
  - Jason Gerard
  - Khagik Chris Astor
  - Lucas Blanchard
  - Rafi Stepanians
- Analysts
  - Andre Ibrahim
  - Ejazali Rezayi
  - Dan Raiu
  - Daren Kafafian
  - Domenic Seccareccia
  - Jason Gerard
  - Khagik Chris Astor
  - Lucas Blanchard
  - Rafi Stepanians
- Designers
  - Domenic Seccareccia
- Developers (Front end & Back end)

- Domenic Seccareccia
- Dan Raiu
- Daren Kafafian
- Ejazali Rezayi
- Khagik Chris Astor
- Rafi Stepanians
- Lucas Blanchard
- Andre Ibrahim
- Jason Gerard
- Testers
  - Andre Ibrahim
  - Ejazali Rezayi
  - Dan Raiu
  - Daren Kafafian
  - Domenic Seccareccia
  - Jason Gerard
  - Khagik Chris Astor
  - Lucas Blanchard
  - Rafi Stepanians

## 2.1.1 Stakeholder Roles

### 2.1.1.1 Users

Users refer to anyone that uses the software for the functionality that it provides. They have an interest in this project since they use it to accomplish some of their tasks. Users consist of Patients, Doctors, Health Officials, Immigration Officers and Administrators.

### 2.1.1.2 Product Owner

The product owner is accountable for maximizing the value of the software being developed. His interest is in the delivery of the project in a timely manner with all requirements completed.

### **2.1.1.3 Project Champion**

The project champion is the main driving force of the project fielding all external inquiries and responses. As such, they have one of the largest and most direct stakes in the project.

### **2.1.1.4 Organization Management Team**

The organizational management team organizes and plans the activities that achieve the company's established goals. They will do this by allocating time to build the project schedule from start to finish, allocate resources, and plan meetings to reach pre-established deadlines. They also have an interest in the project both financially and personally as they are also university students.

### **2.1.1.5 Development Team**

The development team has the same interests as the organizational management team. However, their impact, contribution and stake in the project are different. The development team is primarily focused on executing the activities that result in the system being realized and in turn satisfying established goals.

### **2.1.1.6 Analysts**

Analysts are responsible for accessing and researching market opportunities and gathering requirements. They translate requirements to specifications allowing designers to design a system around those needs, developers to satisfy those needs and testers to ensure all developed features work according to specifications. Their stake in the project revolves around how the data impacts the user.

### **2.1.1.7 Designers**

The designers are responsible for the system design aspects such as architectural design, user interface (UI) design and user experience (UX) design. Their stake in the project revolves around system accessibility, maintainability, upgradability and usability.

### **2.1.1.8 Developers**

The developers must develop a system that satisfies the specifications outlined by the analysts and follows the designs - architectural and interface - specified by the designers. Their stake revolves around the implementation of the system features.

### **2.1.1.9 Testers**

The testers are responsible for quality assurance (QA) during the development and deployment phases. They ensure each developed feature within a sprint passes all associated tests and satisfies the specifications outlined by the analysts. Their stake in the project revolves around user and system QA and quality control (QC).

## 3.0 REQUIREMENTS

The following requirements elicited from the product owners were turned into user stories and subsequently approved by the product owner. Each user story is associated with a corresponding EPIC, has a list of subtasks and a definition of done defining what must be completed in order for said user story to be considered as complete. Furthermore, the description section of each user story is broken down with the following information:

- Definition of done
- Requirements
  - UI Prototype
  - Front end
  - API (Optional)
  - Specifications (Google document attached containing all specifications associated to the user story)
  - Personas (accessible by)
- Acceptance tests
- System tests

Once the user interface design mockups are complete, a prototype is created allowing assigned developers to interact with the designs to get a better sense of how the feature is expected to be interacted by users. Associated links and attachments are then added in the comments section of the associated user story.

### 3.1 User Stories

For Sprint 2, **6 user stories and 18 tasks** have been elicited for a total of **73 user story points**.

See next page to view user stories for sprint 2.

### 3.2 Backlog

The following figure is the view of the project roadmap at the end of sprint 2. See the next page to view the project backlog.

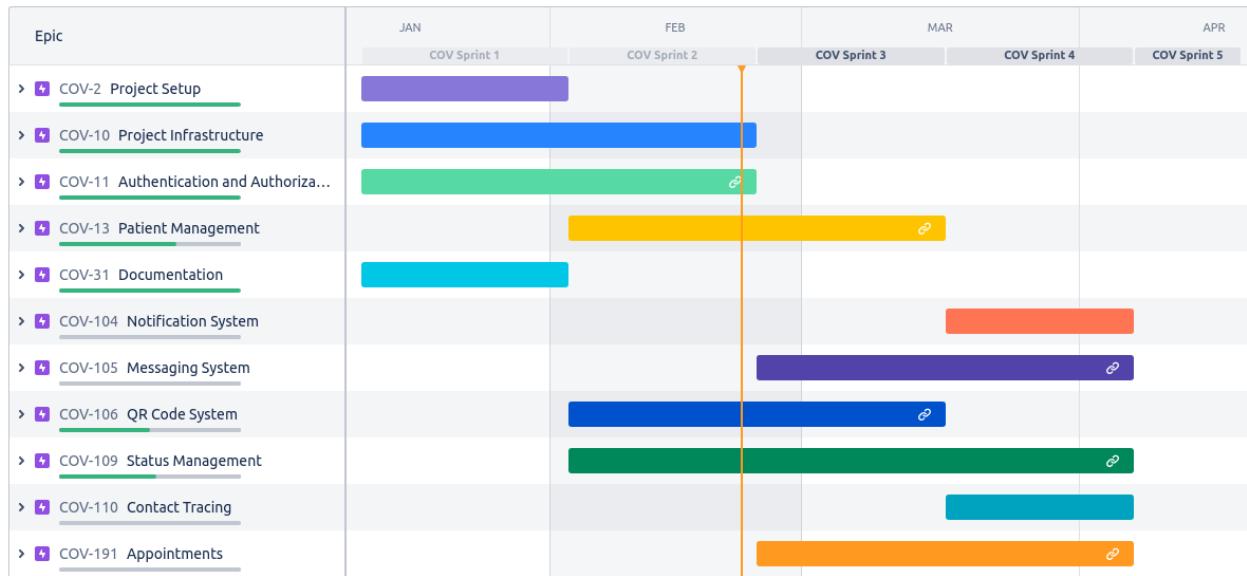


Figure 1: Project Roadmap

## Jira

Type: Bug, Story, Task

Sorted by: Created descending

1–72 of 72 as at: 23/Feb/22 9:58 PM

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date
<input checked="" type="checkbox"/>	COV-192	Create UI prototype for Doctor and Patient "view appointments" page	1	⚡	Low	⚡ Appointments	Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-190	Create UI prototype for Doctor "book an appointment" page	1	⚡	Low	⚡ Appointments	Jason Gerard	Jason Gerard	07/Mar/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-188	Create UI prototype for patients "mark message priority level" button	1	⚡	Low	⚡ Messaging System	Domenic Seccareccia	Jason Gerard	14/Mar/22	07/Mar/22
<input checked="" type="checkbox"/>	COV-187	Create UI prototype for doctor and patients "chat" page	1	⚡	Low	⚡ Messaging System	Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-183	Create UI prototype for doctor "view graphs of status fields" widgets	1	⚡	Low	⚡ Status Management	Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-182	Create UI prototype for doctor "mark patient as prioritized" button	1	⚡	Low	⚡ Patient Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-175	Create UI prototype for doctor "mark patient status as reviewed" page update	1	⚡	Low	⚡ Status Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-174	Create UI prototype for patient "generate QR code of covid test page" button	1	⚡	Low	⚡ QR Code System	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-173	Create UI prototype for patient "generate QR code of status report page" button	1	⚡	Low	⚡ QR Code System	Domenic Seccareccia	Jason Gerard	21/Feb/22	20/Feb/22
<input checked="" type="checkbox"/>	COV-172	As a Health Official, I want the status reports to include a list of places the Patient has been in the last day, so that I can better contact trace them		=		⚡ Contact Tracing	Domenic Seccareccia	Jason Gerard		
<input checked="" type="checkbox"/>	COV-171	As a Health Official, I want to view a list of all patients who have tested positive in the last month, so that I can contract trace them		=		⚡ Contact Tracing	Domenic Seccareccia	Jason Gerard		
<input checked="" type="checkbox"/>	COV-169	As a Doctor, I want to view my appointments, so that I can schedule myself	5	=		⚡ Appointments	Domenic Seccareccia	Jason Gerard		
<input checked="" type="checkbox"/>	COV-166	Create UI prototype for a patient "view details of a single status report" page	1	⚡	Low	⚡ Status Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	
<input checked="" type="checkbox"/>	COV-165	Create UI prototype for a patient "view details of a single test result" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	22/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-160	Create UI prototype for patient "view line item list of status reports for that patient" page	1		Low		Status Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-157	As a Doctor, I want to view a list of my Patients, so that I can easily navigate to their specific detailed views	8		Medium		Patient Management	Domenic Seccareccia	Jason Gerard	05/Mar/22	02/Mar/22
<input checked="" type="checkbox"/>	COV-156	Create UI prototype for doctor "view list of patients" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-155	Create UI prototype for patient "view line item list of covid test results for that patient" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-154	Create UI prototype for admin "view number of patients a doctor has" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	12/Feb/22	12/Feb/22
<input checked="" type="checkbox"/>	COV-153	Create UI prototype for patient "submit covid test results" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	22/Feb/22	19/Feb/22
<input checked="" type="checkbox"/>	COV-152	Create UI prototype for doctor "patient most recent line item status report" page	1		Low		Status Management	Domenic Seccareccia	Jason Gerard	21/Feb/22	11/Feb/22
<input checked="" type="checkbox"/>	COV-151	Create UI prototype for patient "submit status report" page	1		Low		Status Management	Lucas Blanchard	Jason Gerard	13/Feb/22	13/Feb/22
<input checked="" type="checkbox"/>	COV-150	Create UI prototype for doctor "define patient status report fields" page	1		Low		Status Management	Lucas Blanchard	Jason Gerard	13/Feb/22	12/Feb/22
<input checked="" type="checkbox"/>	COV-149	Create UI prototype for admin "assign patient to a doctor" page	1		Low		Patient Management	Domenic Seccareccia	Jason Gerard	12/Feb/22	08/Feb/22
<input checked="" type="checkbox"/>	COV-148	Create UI prototype for admin "add role" page	1		Low		Authentication and Authorization	Domenic Seccareccia	Jason Gerard	12/Feb/22	08/Feb/22
<input checked="" type="checkbox"/>	COV-147	Setup integration tests	1		Low		Project Infrastructure	Jason Gerard	Jason Gerard	22/Feb/22	20/Feb/22
<input checked="" type="checkbox"/>	COV-146	Setup a Dockerfile for the front end and integrate it with docker-compose	2		Low		Project Infrastructure	Jason Gerard	Jason Gerard	06/Feb/22	04/Feb/22
<input checked="" type="checkbox"/>	COV-145	The drop down inputs in the sign in form are pre-selected when they should not have a default value	1		Low		Authentication and Authorization	Jason Gerard	Jason Gerard	04/Feb/22	04/Feb/22

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date
<input checked="" type="checkbox"/>	COV-144	The navbar shows a placeholder name instead of the logged in users name	1		Low	 Authentication and Authorization	Jason Gerard	Jason Gerard	06/Feb/22	06/Feb/22
<input checked="" type="checkbox"/>	COV-132	As a Doctor, I want to send a notification to a Patient, so that they are reminded of an upcoming appointment	2			 Notification System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-131	As a Doctor, I want to be notified when a Patient updates their status more than once in a day, so that I can look into their status	2			 Notification System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-130	Create generic SMS notification infrastructure	5		High	 Notification System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-129	Create generic email notification infrastructure	5		High	 Notification System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-128	As a Health Official, I want to notify contact traced Patients, so that they are required to self quarantine	2			 Notification System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-127	As a Health Official, I want to flag contact traced patients, so that I can monitor their status				 Contact Tracing		Jason Gerard		
<input checked="" type="checkbox"/>	COV-126	As a Health Official, I want to contact trace who a Patient has been in contact with, so that I can manage who is at risk				 Contact Tracing		Jason Gerard		
<input checked="" type="checkbox"/>	COV-125	As a Doctor, I want to see graphs of my Patients symptoms, so that I can see any changes	13		Low	 Status Management		Jason Gerard		
<input checked="" type="checkbox"/>	COV-124	As a Patient, I want to view the details of a single COVID test result, so that I'm aware of my diagnosis	3		High	 Patient Management		Jason Gerard	27/Feb/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-123	As a Patient, I want to view all my line item COVID test results, so that I'm aware of my diagnosis	5		Medium	 Patient Management		Jason Gerard	02/Mar/22	27/Feb/22
<input checked="" type="checkbox"/>	COV-122	As a Patient, I want to be able to generate a QR code for a lab test result, so that I can share it with others	2		High	 QR Code System		Jason Gerard	03/Mar/22	27/Feb/22
<input checked="" type="checkbox"/>	COV-121	As a Patient, I want to be able to generate a QR code for a status report, so that I can share it with others	2		High	 QR Code System		Jason Gerard	03/Mar/22	27/Feb/22

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date
<input checked="" type="checkbox"/>	COV-120	As a Patient, I want to mark my message with a priority level, so that my Doctor will view it quicker	5			 Messaging System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-119	As a Patient, I want to direct message my Doctor, so that I can ask them questions	8			 Messaging System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-117	Create generic websocket direct messaging infrastructure	13		High	 Messaging System		Jason Gerard		
<input checked="" type="checkbox"/>	COV-116	As a Doctor, I want to book an appointment with a Patient, so that we can discuss their symptoms	8			 Appointments		Jason Gerard		
<input checked="" type="checkbox"/>	COV-115	As a Doctor, I want to mark a Patient's status update as "Reviewed", so that I can see which statuses I've already seen	8		High	 Status Management		Jason Gerard	09/Mar/22	06/Mar/22
<input checked="" type="checkbox"/>	COV-114	As a Doctor, I want to flag certain patients, so that their updates are prioritized over others	5		High	 Patient Management		Jason Gerard	09/Mar/22	06/Mar/22
<input checked="" type="checkbox"/>	COV-113	As a Doctor, I want to view a line item list of my patients with their most recent line item status update, so that I can keep track of any updates	13		Medium	 Status Management		Jason Gerard	06/Mar/22	02/Mar/22
<input checked="" type="checkbox"/>	COV-112	As a Patient, I want to view the details of a single status report of a Patient, so that I can view their progress at a point in time	3		Medium	 Status Management		Jason Gerard	27/Feb/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-111	As a Patient, I want to view all my line item statuses, so that I can monitor my progress over time	5		Medium	 Status Management		Jason Gerard	02/Mar/22	27/Feb/22
<input checked="" type="checkbox"/>	COV-108	As a Patient, I want to update my status for the day after already submitting, so that my Doctor stays up to date	3			 Status Management		Jason Gerard	12/Mar/22	10/Mar/22
<input checked="" type="checkbox"/>	COV-107	As a Health Official, I want to input my COVID test results, so that I can report if a Patient tested positive or negative	8		High	 Patient Management		Jason Gerard	26/Feb/22	24/Feb/22
<input checked="" type="checkbox"/>	COV-95	As a Doctor, I want to define the status report fields for my Patients, so I can properly track them	8		High	 Status Management	Jason Gerard, Khachig Astor	Jason Gerard	18/Feb/22	10/Feb/22

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date
<input checked="" type="checkbox"/>	COV-90	As an Administrator, I want the API to authorize users by role, so that access rights are managed	8	↗	High	 Authentication and Authorization	Andre Ibrahim, Jason Gerard	Jason Gerard	08/Feb/22	04/Feb/22
<input checked="" type="checkbox"/>	COV-85	As an Administrator, I want to assign a role to a user, so that I can manage access rights	13	↗	Medium	 Authentication and Authorization	Jason Gerard, rafistep98	Jason Gerard	17/Feb/22	06/Feb/22
<input checked="" type="checkbox"/>	COV-84	Create domain model diagram	2	▬	Low	 Documentation	Andre Ibrahim, Jason Gerard	Jason Gerard	30/Jan/22	29/Jan/22
<input checked="" type="checkbox"/>	COV-76	Create architecture component diagram	2	▬	Low	 Documentation	Jason Gerard	Jason Gerard	28/Jan/22	24/Jan/22
<input checked="" type="checkbox"/>	COV-52	As a User, I want to be able to sign out, so that I can delete my session	5	▬	High	 Authentication and Authorization	Domenic Seccareccia, Jason Gerard, Khachig Astor	Jason Gerard	30/Jan/22	28/Jan/22
<input checked="" type="checkbox"/>	COV-48	As a User, I want to be able to sign in, so that I can access my account	8	▬	High	 Authentication and Authorization	Daren, Domenic Seccareccia, Jason Gerard	Jason Gerard	30/Jan/22	24/Jan/22
<input checked="" type="checkbox"/>	COV-42	As a User, I want to be able to sign up, so that I can access the apps features	13	↗	High	 Authentication and Authorization	Andre Ibrahim, Domenic Seccareccia, Ejazali Rezayi, Jason Gerard	Jason Gerard	31/Jan/22	17/Jan/22
<input checked="" type="checkbox"/>	COV-38	Create initial software architecture document	3	▼	Low	 Documentation	Andre Ibrahim	Jason Gerard	31/Jan/22	24/Jan/22
<input checked="" type="checkbox"/>	COV-33	Update risk management plan and table	2	▼	Low	 Documentation	Dan, Khachig Astor	Jason Gerard	29/Jan/22	26/Jan/22
<input checked="" type="checkbox"/>	COV-30	Add testing framework to web server	2	▬	Low	 Project Infrastructure	Jason Gerard	Jason Gerard	15/Jan/22	14/Jan/22
<input checked="" type="checkbox"/>	COV-27	As an Administrator, I want to view the number of Patients assigned to a Doctor, so that no Doctor has too many Patients	5	▬	Low	 Patient Management	Jason Gerard	Jason Gerard	14/Feb/22	13/Feb/22
<input checked="" type="checkbox"/>	COV-26	As an Administrator, I want to assign a Patient to a Doctor, so that I can manage the Patients	5	↗	Medium	 Patient Management	Andre Ibrahim, Ejazali Rezayi	Jason Gerard	20/Feb/22	09/Feb/22
<input checked="" type="checkbox"/>	COV-25	As a Patient, I want to submit my status, so that I can keep my Doctor updated	13	▬	High	 Status Management	Andre Ibrahim, Jason Gerard	Jason Gerard	20/Feb/22	14/Feb/22
<input checked="" type="checkbox"/>	COV-7	Setup docker for web server	5	▬	Low	 Project Infrastructure	Domenic Seccareccia, Jason Gerard	Jason Gerard	18/Jan/22	17/Jan/22

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date
<input checked="" type="checkbox"/>	COV-6	Configure CI/CD pipeline for web server	2	=	Low	 Project Infrastructure	Jason Gerard	Jason Gerard	17/Jan/22	15/Jan/22
<input checked="" type="checkbox"/>	COV-5	Setup Jira project	1	↗	Low	 Project Setup	Domenic Seccareccia, Jason Gerard	Jason Gerard	18/Jan/22	15/Jan/22
<input checked="" type="checkbox"/>	COV-4	Setup basic project for front end client	5	↗	Medium	 Project Setup	Andre Ibrahim, Dan, Domenic Seccareccia, Khachig Astor, rafistep98	Jason Gerard	23/Jan/22	22/Jan/22
<input checked="" type="checkbox"/>	COV-3	Setup basic web server	5	↗	Medium	 Project Setup	Jason Gerard	Jason Gerard	15/Jan/22	13/Jan/22
<input checked="" type="checkbox"/>	COV-1	Setup GitHub repository	1	↗	Medium	 Project Setup	Jason Gerard	Jason Gerard	15/Jan/22	13/Jan/22

## 4.0 RELEASE PLANNING

This section covers a summary and retrospective for sprint 2 and sprint 3 planning.

### 4.1. Sprint 2

#### 4.1.1 Summary

Sprint 2 mainly focused on delivering user stories in the Patient Management and Status Management epics, and completing all remaining user stories in the Authentication and Authorization epics. The system now includes functionalities related to administrator, patient, and doctor personas. Administrators can assign a role to a user to manage access rights in the system, assign a patient to a doctor, and view the number of patients assigned to a doctor. Doctors can define the status report fields that a patient must fill up, and a patient is able to fill up their assigned status report. All unfixed bugs discovered in sprint 1 were also resolved. Finally, sprint 2 also included all the UI mockups and prototypes associated with the user stories that will be completed in sprint 3.

#### Project velocity after Sprint 2: 64.5 User Story Points

Date - February 3, 2022 - February 23, 2022

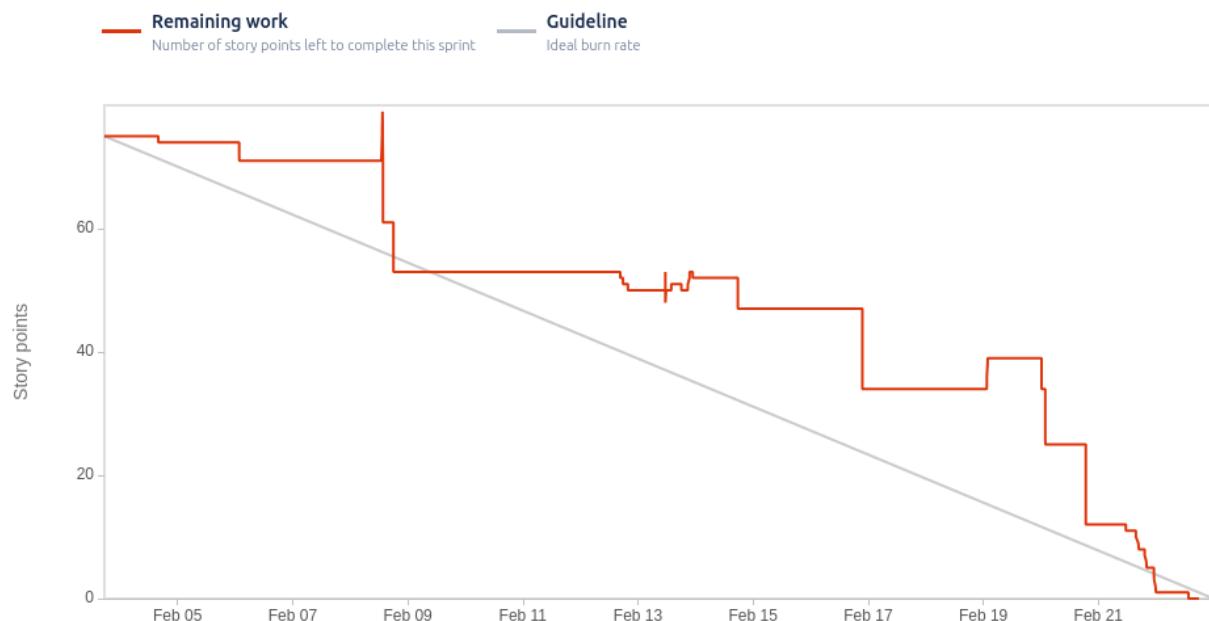


Figure 2: Burndown Chart

#### **4.1.2 Retrospective**

View the report of the sprint 2 retrospective meeting on the next page.

Went Well	To Improve	Action Items
+ 95% for sprint 1, good work everyone -- Considering busy midterm/deadline week, we worked well	+ Start working on stuff earlier, don't wait until the last minute -- frontend work can start sooner -- Sprint 3 is going to be a lot more user stories, so make sure to start early now that we have the UI prototypes all done ahead of time	+ @everyone start working on user stories earlier in the sprint instead of backloading everything until the end.  👍 0 💬 0
Finally getting a grip of vuexy for frontend implementation	👍 3 💬 0	👍 8 💬 0
UI design and prototypes -- Back on track with the UI prototypes	Inform people when something assigned to you is taking longer than X days -- update jira ticket to make sure we are all on the same page	-- make more commits so we can see progress -- 👍 6 💬 0
backend work went well	👍 2 💬 0	When having trouble, seek for help -- When free ask if someone needs help 👍 5 💬 0

## 4.2 Sprint 3

### 4.2.1 Planning

Sprint 3 will focus on delivering user stories in the following epics: Patient Management, Status Management, QR Code System, Messaging System, and Appointments. Further features will be added to the system to expand the patient and status management functionality currently implemented as of sprint 2. The QR code system will be implemented allowing specific patient status reports and test result details to be easily shared. User interface mockups and prototypes related to most of the functionality in the Appointments and Messaging System epics currently planned for sprint 4 will be created. Sprint 3 encompasses the majority of work allowing a full end to end flow of interactions between patients, doctors, and health officials. At the end of sprint 3, many of the core management functionality will be fully implemented and functioning.

## Jira

Type: Bug, Story, Task  
 : COV Sprint 3  
 Sorted by: Created descending  
 1-17 of 17 as at: 23/Feb/22 10:02 PM

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description
<input checked="" type="checkbox"/>	COV-192	Create UI prototype for Doctor and Patient "view appointments" page	1		Low		Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22	
<input checked="" type="checkbox"/>	COV-190	Create UI prototype for Doctor "book an appointment" page	1		Low		Jason Gerard	Jason Gerard	07/Mar/22	24/Feb/22	
<input checked="" type="checkbox"/>	COV-188	Create UI prototype for patients "mark message priority level" button	1		Low		Domenic Seccareccia	Jason Gerard	14/Mar/22	07/Mar/22	
<input checked="" type="checkbox"/>	COV-187	Create UI prototype for doctor and patients "chat" page	1		Low		Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22	
<input checked="" type="checkbox"/>	COV-183	Create UI prototype for doctor "view graphs of status fields" widgets	1		Low		Domenic Seccareccia	Jason Gerard	07/Mar/22	24/Feb/22	<p><b>UI Prototype:</b></p> <ul style="list-style-type: none"> <li>Add pie chart graphs on the todays status reports page of the different true / false status report options</li> <li>Add time series graphs for weight and temperature change over time for a single patient on the patients status reports page</li> </ul>
<input checked="" type="checkbox"/>	COV-157	As a Doctor, I want to view a list of my Patients, so that I can easily navigate to their specific detailed views	8		Medium		Domenic Seccareccia	Jason Gerard	05/Mar/22	02/Mar/22	<p><b>Definition of done:</b> A Doctor should be able to view a table of their patients with a link to a page containing a list of that patients test results and a link to a page containing a list of that patients statuses.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Should only be accessible to doctor role</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>GET to /doctors/:doctorId/patients</li> <li>Body: None</li> <li>Check if id in jwt is doctor</li> <li>Return status 200 <ul style="list-style-type: none"> <li>List of patient info <ul style="list-style-type: none"> <li>name</li> <li>email</li> <li>patientid</li> </ul> </li> </ul> </li> </ul> <p><b>Specifications</b></p> <p><a href="https://docs.google.com/document/d/1VYFUgmq8AmBMqNGYsUccmAzsCzrорz7rf1pVv_ylFh4/edit?usp=sharing">https://docs.google.com/document/d/1VYFUgmq8AmBMqNGYsUccmAzsCzrорz7rf1pVv_ylFh4/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Doctor</li> </ul>
<input checked="" type="checkbox"/>	COV-124	As a Patient, I want to view the details of a single COVID test result, so that I'm aware of my diagnosis	3		High		Jason Gerard	Jason Gerard	27/Feb/22	24/Feb/22	<p><b>Definition of done:</b> A Patient should be able to view all information associated with a single covid test result.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Should only be accessible to patient role and doctor role</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>GET to /patients/:patientId/tests/:testId</li> <li>Body: None</li> <li>Check if id in jwt is patient id or if patient id is assinged to doctor id in the jwt</li> <li>Return status 200 <ul style="list-style-type: none"> <li>Details of a single test</li> </ul> </li> </ul> <p><b>Specifications</b></p> <p><a href="https://docs.google.com/document/d/1UMpubgcigZ_9IM2Rm3e8S81n_jpxbLhEFzXeo1iHEuA/edit?usp=sharing">https://docs.google.com/document/d/1UMpubgcigZ_9IM2Rm3e8S81n_jpxbLhEFzXeo1iHEuA/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Patient</li> <li>Doctor</li> <li>Health Official</li> </ul>

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description
BUG	COV-123	As a Patient, I want to view all my line item COVID test results, so that I'm aware of my diagnosis	5	^	Medium	<span>Patient Management</span>	Jason Gerard	02/Mar/22	27/Feb/22		<p><b>Definition of done:</b> A patient should be able to access a page with a line item list of their covid test results.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>• Should implement UI design</li> <li>• Should only be accessible to patient role or doctor</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>• GET to /patients/:patientId/tests</li> <li>• Body: None</li> <li>• Check if patient id is the same id as in the JWT or if patient id is a patient of the doctor</li> <li>• Return status 200 <ul style="list-style-type: none"> <li>◦ List of covid test results ordered by date desc (newest at the top)</li> </ul> </li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1FmayxU7gUpP7raHPtVXu9tbJJuMTFIxLruvH5eDOXQ/edit?usp=sharing">https://docs.google.com/document/d/1FmayxU7gUpP7raHPtVXu9tbJJuMTFIxLruvH5eDOXQ/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>• Patient</li> </ul>
BUG	COV-122	As a Patient, I want to be able to generate a QR code for a lab test result, so that I can share it with others	2	▼	High	<span>QR Code System</span>	Jason Gerard	03/Mar/22	27/Feb/22		<p><b>Definition of done:</b> A patient should be able to generate a QR code containing the URL of the page of one of their covid test result.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>• Anyone with access to this page (patients and doctors) should be able to generate the QR code</li> <li>• QR code just contains the URL to that page</li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1h2zv5NTLIVDHRbvXGt_RVk7vsnGdbelkmGjQz8WZH4/edit?usp=sharing">https://docs.google.com/document/d/1h2zv5NTLIVDHRbvXGt_RVk7vsnGdbelkmGjQz8WZH4/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>• Patient</li> <li>• Doctor</li> <li>• Health Official</li> </ul>
BUG	COV-121	As a Patient, I want to be able to generate a QR code for a status report, so that I can share it with others	2	▼	High	<span>QR Code System</span>	Jason Gerard	03/Mar/22	27/Feb/22		<p><b>Definition of done:</b> A patient should be able to generate a QR code containing the URL of the page of one of their status reports.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>• Anyone with access to this page (patients and doctors) should be able to generate the QR code</li> <li>• QR code just contains the URL to that page</li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1LhHw1bJ5ob6lpIyUIGFaqbPhTYs9BmzehvfdK47g4/edit?usp=sharing">https://docs.google.com/document/d/1LhHw1bJ5ob6lpIyUIGFaqbPhTYs9BmzehvfdK47g4/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>• Patient</li> <li>• Doctor</li> <li>• Health Official</li> </ul>
BUG	COV-115	As a Doctor, I want to mark a Patient's status update as "Reviewed", so that I can see which statuses I've already seen	8	▼	High	<span>Status Management</span>	Jason Gerard	09/Mar/22	06/Mar/22		<p><b>Definition of done:</b> A doctor should be able to mark a patients status as reviewed so that they can organize themselves better and see which statuses are new or the ones they have yet to see.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>• This is augmenting the view where the doctor can see the most recent line item statuses of their patients.</li> </ul> <p><b>Back end:</b></p> <ul style="list-style-type: none"> <li>• Endpoint for a doctor to mark a status as reviewed <ul style="list-style-type: none"> <li>◦ PUT to /patients/:patientId/statuses/:statusId</li> <li>◦ Body: {reviewed: boolean}</li> <li>◦ Add route verification for "is status associated to patient, is patient associated to doctor"</li> <li>◦ Returns status 204</li> </ul> </li> </ul> <p><b>Database</b></p> <ul style="list-style-type: none"> <li>• new column in the statuses table for is_reviewed BOOLEAN NOT NULL</li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1YsY4wT_vBrnST_Wcn4dBK-mRHjdZjv8qkg7dh-Y_W08/edit?usp=sharing">https://docs.google.com/document/d/1YsY4wT_vBrnST_Wcn4dBK-mRHjdZjv8qkg7dh-Y_W08/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>• Doctor</li> </ul>

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description
114	COV-114	As a Doctor, I want to flag certain patients, so that their updates are prioritized over others	5	High	5	Patient Management	Jason Gerard	09/Mar/22	06/Mar/22	09/Mar/22	<p><b>Definition of done:</b> A doctor, health official, or immigration officer should be able to flag patients so that their statuses appear on the top of the list.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Doctors, health officials, and immigration officers should all use the today status report page to flag patients.</li> <li>The flag can be added or deleted by clicking the button</li> </ul> <p><b>Back end:</b></p> <ul style="list-style-type: none"> <li>Endpoint for a Doctors, health officials, and immigration officers to set a prioritization flag on a patient <ul style="list-style-type: none"> <li>PUT to <ul style="list-style-type: none"> <li>/patients/:patientId</li> </ul> </li> <li>Body: {prioritized: boolean} <ul style="list-style-type: none"> <li>False → not prioritized</li> <li>True → prioritized</li> </ul> </li> <li>Add route verification for "is health official, immigration officer, or is doctor assigned to patient"</li> <li>Returns status 204</li> </ul> </li> </ul> <p><b>Database:</b></p> <ul style="list-style-type: none"> <li>Add new column in patients table is_prioritized BOOLEAN NOT NULL</li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1ix18zZqyFehyL9MjzLmFduEybzsgb-LyL3KGsGGIQ/edit?usp=sharing">https://docs.google.com/document/d/1ix18zZqyFehyL9MjzLmFduEybzsgb-LyL3KGsGGIQ/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Doctor</li> <li>Health Official</li> </ul>
113	COV-113	As a Doctor, I want to view a line item list of my patients with their most recent line item status update, so that I can keep track of any updates	13	Medium	13	Status Management	Jason Gerard	06/Mar/22	02/Mar/22	06/Mar/22	<p><b>Definition of done:</b> A doctor should be able to view a page with a line item list of their patients most recent status updates</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>The list items should not be clickable, adding a clickable detailed view for each patient is added in another story</li> <li>Page should be accessible by doctors and health officials</li> </ul> <p><b>Back end:</b></p> <ul style="list-style-type: none"> <li>Endpoint for a doctors patients status will include a doctorId query parameter <ul style="list-style-type: none"> <li>GET to <ul style="list-style-type: none"> <li>Unknown macro: {doctorId}</li> <li>&amp;latest=true}}</li> <li>/patients/statuses?latest=true</li> </ul> </li> <li>Body: None</li> <li>Add route verification for "is health official, immigration officer or does doctor id in query param match id in JWT"</li> <li>Return the latest status for each patient (filtered by doctor id when doctor id passed) <ul style="list-style-type: none"> <li>Each status should contain all necessary info to populate the front end table</li> </ul> </li> <li>Returns status 200 <ul style="list-style-type: none"> <li>List of patient statuses</li> </ul> </li> </ul> </li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1W8IAQvndubudshev1aGKnrvAa8sO1CuUfDE9YQ0Zndc/edit?usp=sharing">https://docs.google.com/document/d/1W8IAQvndubudshev1aGKnrvAa8sO1CuUfDE9YQ0Zndc/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Doctor</li> <li>Health Official</li> </ul>

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description
BUG	COV-112	As a Patient, I want to view the details of a single status report of a Patient, so that I can view their progress at a point in time	3	✗	Medium		<span>Status Management</span>	Jason Gerard	27/Feb/22	24/Feb/22	<p>Page for patient, doctor, health official</p> <p><b>Definition of done:</b> A Patient should be able to view all information associated with a single status report.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Should only be accessible to patient role, doctor role, and health official role</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>GET to /patients/:patientId/statuses/:statusId</li> <li>Body: None</li> <li>Check if id in jwt is patient id or if patient id is assigned to doctor id in the jwt or health official id in jwt</li> <li>Return status 200 <ul style="list-style-type: none"> <li>Details of a single status report</li> </ul> </li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1D4WMm8lQKqgRA-0vEc7D-py8LL5iwfon1eoFBuGLUOw/edit?usp=sharing">https://docs.google.com/document/d/1D4WMm8lQKqgRA-0vEc7D-py8LL5iwfon1eoFBuGLUOw/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Patient</li> <li>Doctor</li> <li>Health Official</li> </ul>
BUG	COV-111	As a Patient, I want to view all my line item statuses, so that I can monitor my progress over time	5	✗	Medium		<span>Status Management</span>	Jason Gerard	02/Mar/22	27/Feb/22	<p><b>Definition of done:</b> A Patient should be able to view a table page of a line item list of all their status reports.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Should be accessible to patient role, doctor role</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>GET to /patients/:patientId/statuses</li> <li>Body: None</li> <li>Check if id in jwt is patients id</li> <li>Return status 200 <ul style="list-style-type: none"> <li>List of patients status reports</li> <li>ordered by date desc</li> </ul> </li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1JJyLDn6o3lEMXGwQ7fRRIIftdAHB0pb9nlxtw74is/edit?usp=sharing">https://docs.google.com/document/d/1JJyLDn6o3lEMXGwQ7fRRIIftdAHB0pb9nlxtw74is/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Patient</li> </ul>
BUG	COV-108	As a Patient, I want to update my status for the day after already submitting, so that my Doctor stays up to date	3	✗			<span>Status Management</span>	Jason Gerard	12/Mar/22	10/Mar/22	<p><b>Definition of done:</b> A patient should be able to submit more than one status report per day.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>N/A</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>Update and remove restriction on API blocking a user from making multiple status reports in a single day</li> </ul>

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description
COV-107	As a Health Official, I want to input my COVID test results, so that I can report if a Patient tested positive or negative	8	8	High	Patient Management		Jason Gerard		26/Feb/22	24/Feb/22	<p><b>Description:</b> A health official or doctor should be able to submit a form that details the results of an externally taken Covid test to persist the data in the system for a patient.</p> <p><b>Requirements:</b></p> <p><b>Front end:</b></p> <ul style="list-style-type: none"> <li>Add page to navbar "submit test result"</li> <li>Implement all form fields and data validation</li> <li>Should only be accessible by patients</li> </ul> <p><b>API:</b></p> <ul style="list-style-type: none"> <li>POST to /patients/:patientId/tests</li> <li>Body: Fields of form with input</li> <li>Should check patient id in jwt is patient id in path param</li> <li>Store result in new db table</li> <li>Return status 201</li> </ul> <p><b>Database:</b></p> <ul style="list-style-type: none"> <li>Create new db table test_results <ul style="list-style-type: none"> <li>Columns for <ul style="list-style-type: none"> <li>testId primary key</li> <li>patientId</li> <li>all other form fields</li> </ul> </li> </ul> </li> </ul> <p><b>Specifications:</b></p> <p><a href="https://docs.google.com/document/d/1hO9E-5gEwXObLIIHmCw3Wkhr8rV5nfwBvnHCImHR6-w/edit?usp=sharing">https://docs.google.com/document/d/1hO9E-5gEwXObLIIHmCw3Wkhr8rV5nfwBvnHCImHR6-w/edit?usp=sharing</a></p> <p><b>Personas (accessible by):</b></p> <ul style="list-style-type: none"> <li>Doctor</li> <li>Health Official</li> </ul>

## 5.0 SOFTWARE ARCHITECTURE

This section provides an overview of the system to be built using both a domain model and a component diagram depicting and describing the chosen design decisions of the system.

Date Issued	January 11, 2022
Status	Sprint 2 completed
Authors	Jason Gerard, Andre Ibrahim, Domenic Seccareccia
Reviewers	Domenic Seccareccia, Jason Gerard
Scope	The domain model covers the domain of the application while the component diagram covers the entire system in development.
Context	This is the second sprint for the web application "CovidTracker". Diagrams will be expanded and improved over each sprint iteration.

Table 4: Supplementary Information

### 5.1 Stakeholder Concerns

Stakeholder concerns associated with CovidTracker are depicted in the following Stakeholder Concern Traceability Matrix. Only stakeholders that have a concern impacted by the systems architecture are present in this table.

	Developer	Project Champion	Testers	Product Owner	User
<b>System failure</b>					

<b>Security breach</b>	✗	✗			
<b>Unscalable architecture</b>	✗	✗			
<b>Tightly coupled layers</b>	✗	✗			
<b>System complexity</b>	✗	✗	✗		
<b>Longer development time</b>		✗		✗	✗

Table 5: Stakeholder Concern Traceability Matrix

## 5.2 Diagrams

### 5.2.1 Domain Model

The UML domain model for CovidTracker describing all system entities, relationships and associations is represented by the UML domain model diagram seen in Figure 3. The diagram can be viewed in draw.io through this link:

- [UML Domain Model Class Diagram of CovidTracker](#)

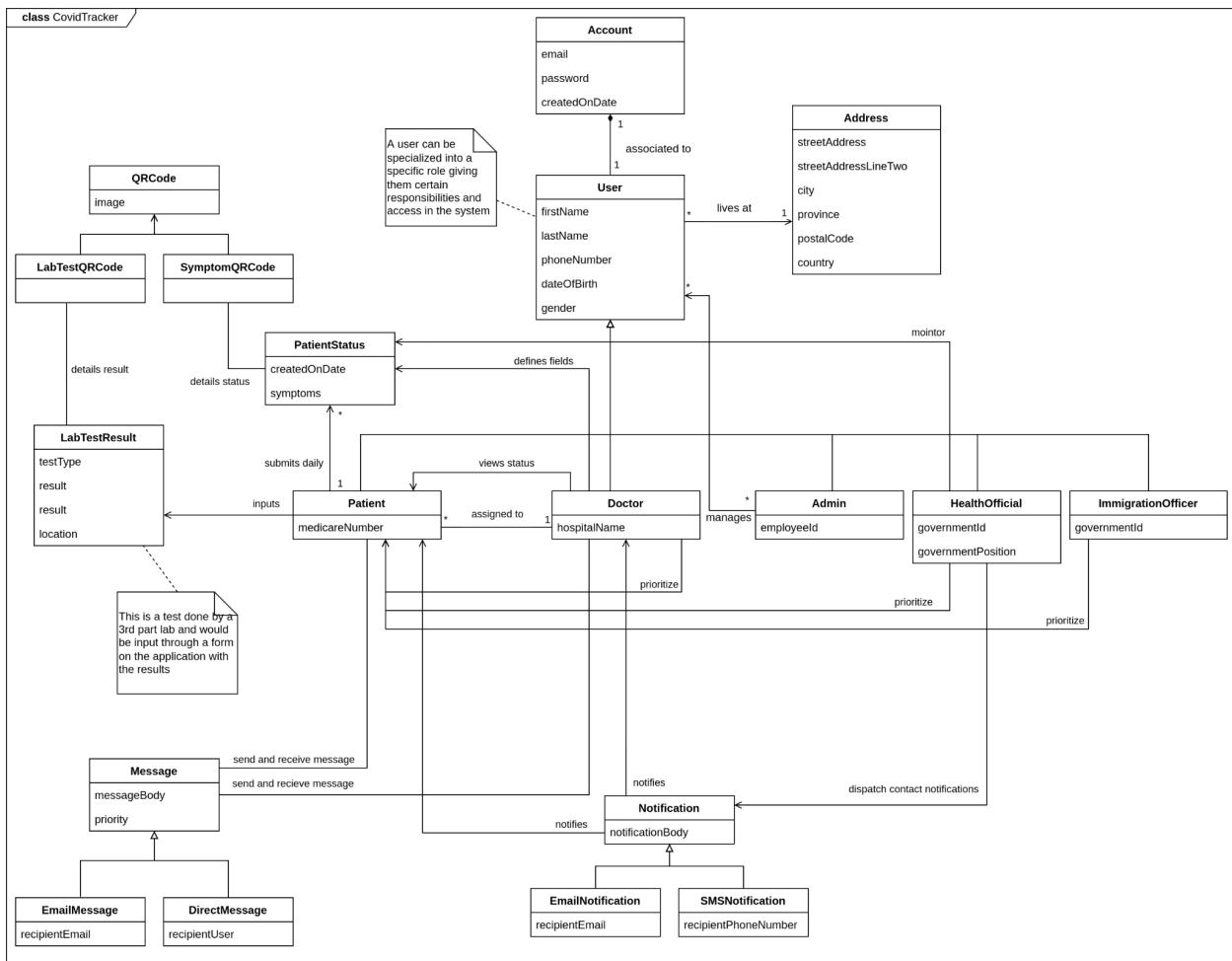


Figure 3: UML Domain Model Class Diagram of CovidTracker

A few key decisions were made during the creation of the Domain Model. The user entity is split into 2 separate entities: person and account. A user has a single account and then can have a specialized role through inheritance (i.e. Doctor, Admin, Patient etc.). This encapsulates the core attributes of a role in the user and keeps it modular from the account itself which gives us a lot of flexibility when designing the authentication and authorization system.

### 5.2.2 Component Diagram

There are 2 UML component diagrams for CovidTracker (see Figures 4 and 5) each describing the layers of the system at a different level of abstraction as well as the components within each layer and their relationships. The component diagram (Figure 3) shows the service level components, their required and provided interfaces, and how they interact. The architecture component diagram (Figure 5) displays the general architecture of the monolithic server and thin client. The diagrams can be viewed in draw.io through this link:

- [Component Diagram of CovidTracker](#)

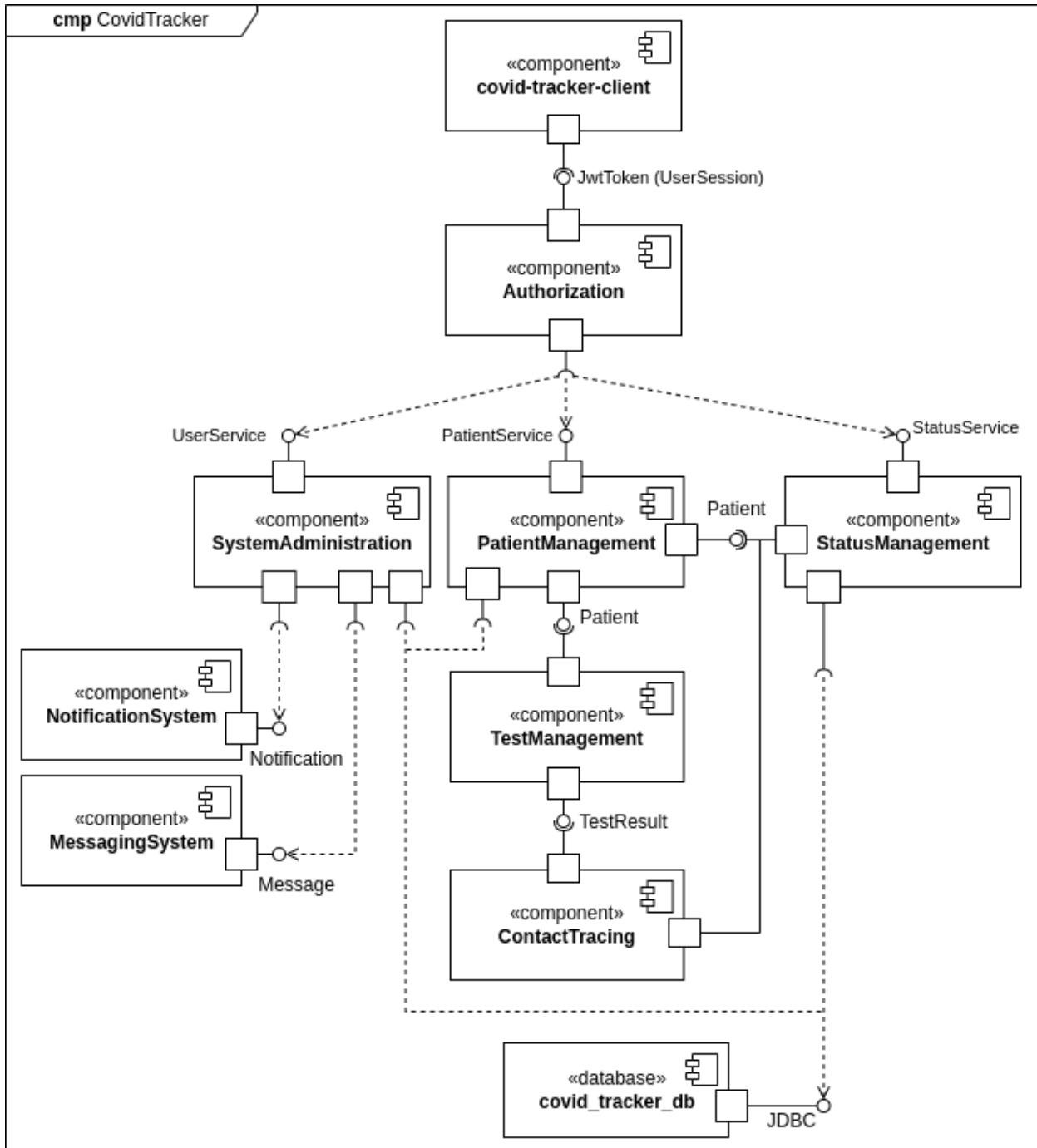


Figure 4: Component Diagram of CovidTracker

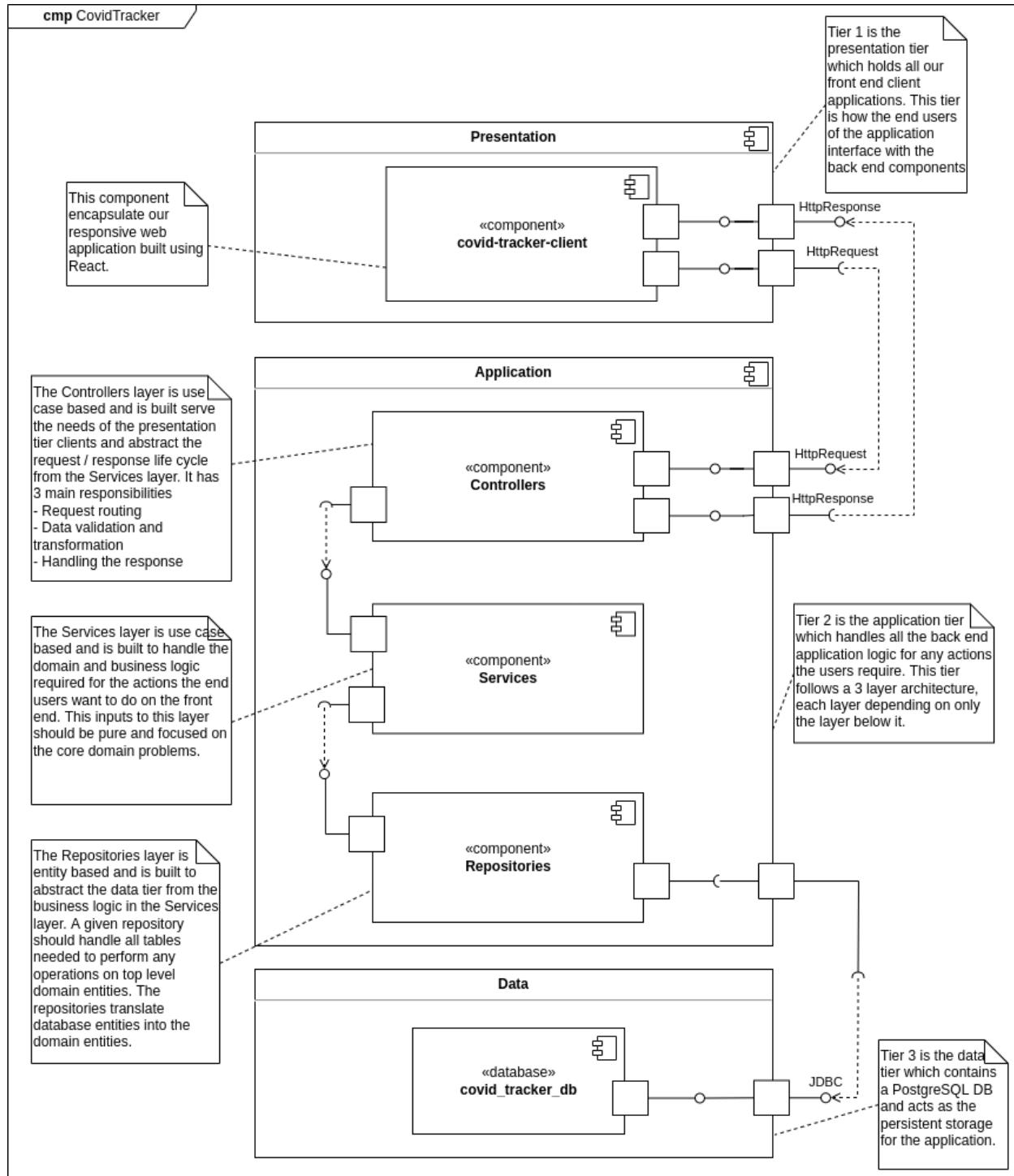


Figure 5: Architecture Component Diagram of CovidTracker

The architecture of the system follows a 3-Tier architecture with the middle application tier using a layered architecture. The 3 tiers include the presentation tier, application tier and data tier. The presentation tier is the front end of the application. The application tier contains our web server which handles all the business logic of our application. Lastly, the data tier is the persistent storage layer for the application. The application tier has 3 layers which include: controller, service, and repository layers that allows the system to have low coupling and high cohesion. We utilize dependency injection to further separate the concerns between our layers. The standard flow of data starts at the presentation tier (the frontend) where a HTTP request is made to the application tier. The controller layer handles all routing, passing the data to the service layer, then to the repository layer to convert to schema form and make the JDBC connection with the database tier to persist the data.

## 5.3 Tech Stack

### 5.3.1 Presentation Tier

The client is encapsulated by the presentation tier and currently contains a single front end service, built using JavaScript and React, which is the primary way a client can interact with the system.

React was chosen because it is one of the largest and most tested front end frameworks on the open source market. Other competitors include Vue.JS and Angular. Angular is outdated and leans towards a thick client approach which is mostly considered an anti-pattern with front end web applications as they can become slow and hard to maintain overtime. While Vue.JS is a great framework, React ended up being chosen simply because more people on the team had experience with it.

The front end also uses SCSS which is a CSS preprocessing language that allows us to extend what can normally be done with CSS such as adding variables and mixins.

The client will be running in its own docker container which will allow it to be easily productionalized and deployed while also being compatible on all our developers' local machines.

### 5.3.2 Application Tier

The application tier consists of a single web server accepting HTTP requests from the front end client. This monolithic service is built using TypeScript and runs inside a docker container. TypeScript was chosen due to its clean syntax and advanced type system. As a result of TypeScript being transpiled in JavaScript, all JavaScript libraries work with TypeScript as well. This means we can also take advantage of the vast open source libraries built over the years by the web service oriented JavaScript community. Since we wanted to use a statically typed language to make it easier to model our domain in code and build clean type hierarchies, Python and JavaScript were out. Java was also considered however even with recent advancements aiming to improve the language it is still verbose and extremely opinionated in its packages with Java Spring being a perfect example. There was simply a desire to choose a language that was more flexible.

The web framework the service uses is Restify paired with the dependency injection package called Inversify. Restify was chosen because it is a simple framework that is not opinionated and allows us to only use and build what is needed. Thus abstracting away a lot of the boiler plate while still providing the ability to customize the service as needed. Other alternatives include express which has great 3rd party library support due to its popularity.

The web service uses an NPM package called pg which is a non-blocking client for PostgreSQL that provides the ability to write native SQL statements and abstract away the database connection pooling and type coercion. The main alternative for database interaction would be to use an object relational mapper (ORM), a popular one being TypeORM, that abstract away the entire concept of SQL statements and schema and leave a simple API for the application developer to work with. In our team's experience ORMs only make it easy to do the simple stuff which is easy to do anyways. When it comes to the complex parts you have to write the SQL by hand anyways so it's best to have full control from the start.

### 5.3.3 Data Tier

The data tier is currently using a single PostgreSQL database to store all the needed relational data. PostgreSQL was chosen as it is the most modern and maintained open source relational database. There is a large community that creates many libraries for all different types of languages and so many people on the team were already familiar with its standard SQL syntax. Other alternatives include MySQL and

Oracle Database but these database systems lack some of the advanced features and polish PostgreSQL has. The PostgreSQL instance our application uses runs inside its own docker container to make setup quick and easy for the development team.

## 5.4 External Libraries

### 5.4.1 Vuexy

Vuexy is a user interface templating library used for building user interface components and layouts in CovidTracker. Vuexy provides a fast and easy approach for building responsive web applications as it is built with a mobile first mindset. As such, this ensures that any element, component or feature built with the corresponding set of tools provided results in a responsive application from the onset. Without such a library, more painstaking time would be required to ensure that all user interface components function as expected regardless of platform. As such, developers can spend more time focusing on device compatibility and fine tuning the overall user experience.

Vuexy's underlying architecture is built on various external React libraries and Bootstrap 5, thus ensuring vast compatibility and various ways to build elements. Developers are free to decide whether or not using a pre-built Vuexy component is a better option instead of either using a basic Bootstrap 5 component or building it from scratch.

Unfortunately, Vuexy does have some major disadvantages. The main one is the sheer complexity of the library. While one would assume it is simple in nature whereby you only need to search and find the relevant components, attempting to find, decipher and then import the associated code is rather complicated. There is an extreme amount of interconnectivity between the provided files that result in a less than ideal amount of time being spent understanding what is necessary for a single component to work. Secondly, due to the interconnectivity of files, it is a rather tedious process to delete any non relevant files given the complex references between all files and displayed errors if not removed properly. Lastly, while the documentation is rather informative and thorough, there is more to be desired in regards to further explanation of certain components and elements.

While other user interface templating libraries were researched - CoreUI, Fuse and Isomorphic -, Vuexy was decided as the go to for two reasons. The first one was due to the variety of pre-built elements and components provided. For example, with the

inclusion of layouts, forms, authentication, localization, charts, graphs and interactive data table components, developers do not have to spend many hours building these complicated UI components once a level of understanding is achieved on how to use them. Secondly, Figma UI design files are included, a rarity for these types of libraries. The inclusion of these files are extremely helpful during UI mockup design as the designers do not have to recreate all the elements from the template from scratch. Thus, allowing designers to spend more time focusing on the overall user interface and experience. This also helps ensure both the UI mockups and developed interfaces are a 1 for 1 match.

## 6.0 RISK ASSESSMENT AND MANAGEMENT PLAN

The risk assessment and management plan for CovidTracker is depicted and described in the following table. One risk was added and none turned out to not be risks in sprint 2.

Risk ID	Description	Resolved in Sprint	Strategy and Effectiveness	Probability	Impact
R-1	Computers can crash causing us to lose our work	1	We decided to store our work in the cloud. This strategy has proven successful thus far.	Low	Severe
R-2	Database crashing			Low	Severe
R-3	Database leak and all the patient's medical record is stolen			Low	Severe
R-4	Not having the same versions of software in our systems	1	We decided to use docker to ensure every member is on the same version while working on the project.	Low	Minor
R-5	Changes in the law preventing us from			Medium	Severe

	using GPS tracking				Low	Moderate
R-6	Code being pushed to the main without validation	1	A CI/CD pipeline is used in Github and at least one code approval is needed before any code is merged in the main branch. This ensures the author of the code cannot just merge the code without approval.	Low	Moderate	
R-7	Timeline estimates unrealistic	1	Playing poker was used. Every member took a vote on each task for a realistic timeline and we took the average length as the final length for a task.	Medium	Moderate	
R-8	Project team availability	1	Every member dedicated a certain amount of time for this class from the beginning of the semester.	Low	Moderate	
R-9	Weak user participation (if no one decides to use the website)			Medium	Moderate	
R-10	A user having access to page/feature outside the scope of their role			Medium	Moderate	

Table 6: Risk Analysis Table

## 7.0 USER INTERFACE DESIGN

All personas, supported devices, UI and user flow mockups, and interactive prototypes are depicted and described in the following sections.

### 7.1 Personas

CovidTracker is accessible by the following five user personas: Patients (see Figure 6), Doctors (see Figure 7), Health Officials (see Figure 8), Immigration Officers (see Figure 9) and Administrators (see Figure 10). Each persona is considered to be representative of a certain archetype within the general demographic.



**Chantelle Smith**

AGE 29  
EDUCATION Masters in Biology  
GENDER Female  
OCCUPATION Lab Technician  
LOCATION Longueuil

**“** Covid really impacted my life! This app will benefit us in many ways!

**Bio**

She currently lives in Longueuil. She is single. She is currently in the process of doing her PhD. In her spare time, she likes to work on model cars and build puzzles.

**Core needs**

- Accurate screening
- Easy to use user interface
- The price of the service is very important

**Tasks**

- Must update their status before a certain time of the day
- Must provide temperature, weight, list of symptoms, etc.
- Must re-update their status if there's a change on the same day and they would like the doctor to be notified

**Platform**



Mobile App

Figure 6: Patient Persona



**Hakim Nadir**

AGE 43  
EDUCATION Master of Medicine  
GENDER Male  
OCCUPATION Doctor  
LOCATION Montreal

This online platform will help me connect with patients in real time!

**Bio**

He currently lives in Montreal. He is married and has two children. He was always good at school and smart. In his spare time, he likes to spend time with his kids and fish/kayak.

**Core needs**

- Monitor the status of positive patients
- Rapid and secure access to patient medical history
- Make sure that the appropriate isolation is done by the patient

**Tasks**

- Contact patients by priority
- Raise flags on certain COVID-19 patients
- Advise and take care of patients
- Arrange appointments with a COVID-19 patient and review patient's updates

**Platform**


Website

Mobile App

Figure 7: Doctor Persona



**Candy Moore**

AGE 51  
EDUCATION Masters in Health Science  
GENDER Female  
OCCUPATION Health Official  
LOCATION Montreal

Covid is a very serious pandemic, this app will help us track it.

**Bio**

She currently lives in Montreal. She moved from Los Angeles after her divorce to start a new life. She graduated all her studies three years ago. In her spare time, she likes to ski and skate.

**Core needs**

- Filter out the patients
- Monitor people who came in contact with a positive case
- View the location of the infected patient

**Tasks**

- Monitor patients with or without covid
- Make sure patients upload their daily update
- Trace and notify the people with whom COVID-19 patients have been in contact

**Platform**


Website

Figure 8: Health Official Persona

**James Frank Hopkins**



AGE	30
EDUCATION	DEC in Human Resources
GENDER	Male
OCCUPATION	Immigration Officer
LOCATION	Montreal

**“** I don't like going outside, this will help me self-isolate

**Bio**

He currently lives in Montreal. He just got married. After finishing his CEGEP, he did all the certificates to become an immigration officer. In his spare time, he likes to relax and watch tv.

**Core needs**

- View the vaccination status of people
- Raise flags on certain COVID-19 patients

**Tasks**

- Raise flags on certain COVID-19 patients, so that their updates are prioritized over others

**Platform**



Mobile App

Figure 9: Immigration Officer Persona

**Chad Pecheur**



AGE	25
EDUCATION	Master's in Business Administration
GENDER	Male
OCCUPATION	Administrator
LOCATION	Laval

**“** I like to be able to spend more time at home to play video games, this app will help me save time

**Bio**

He currently lives in Laval. He is single and he just finished his MBA. In his spare time he likes to play video games.

**Core needs**

- Administrator rights to the system (not allowed to view the medical data)
- Managing the user accounts of the system

**Tasks**

- Must assign doctors to patients
- Must manage the user accounts of the system
- Must know how many patients are assigned to each doctor so that no doctor is overloaded while some others do not have as many patients

**Platform**



Website    Mobile App

Figure 10: Administrator Persona

## 7.2 Supported Devices

CovidTracker currently supports desktop and mobile platforms. More specifically, regardless of desktop device, all desktop based web browsers are supported. Likewise, regardless of mobile device, all mobile based web browsers are supported. Figures have been provided below describing the various physical and virtual interface elements present on some of the supported devices.

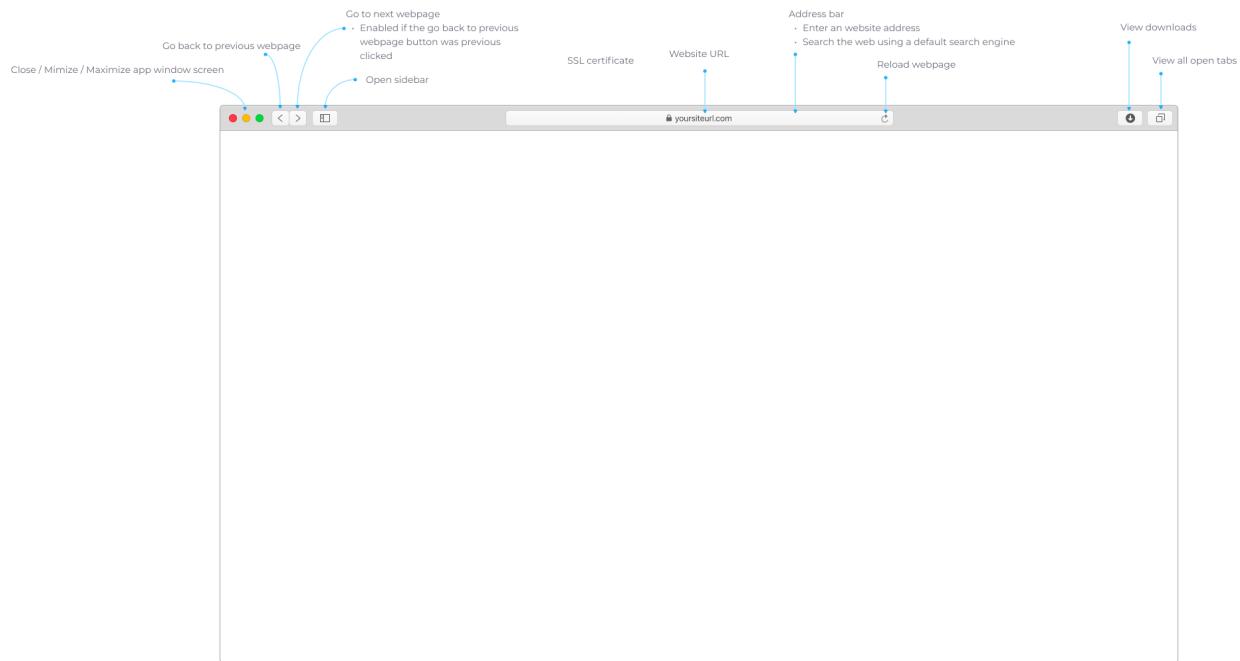


Figure 11: Safari Web Browser Interface Elements

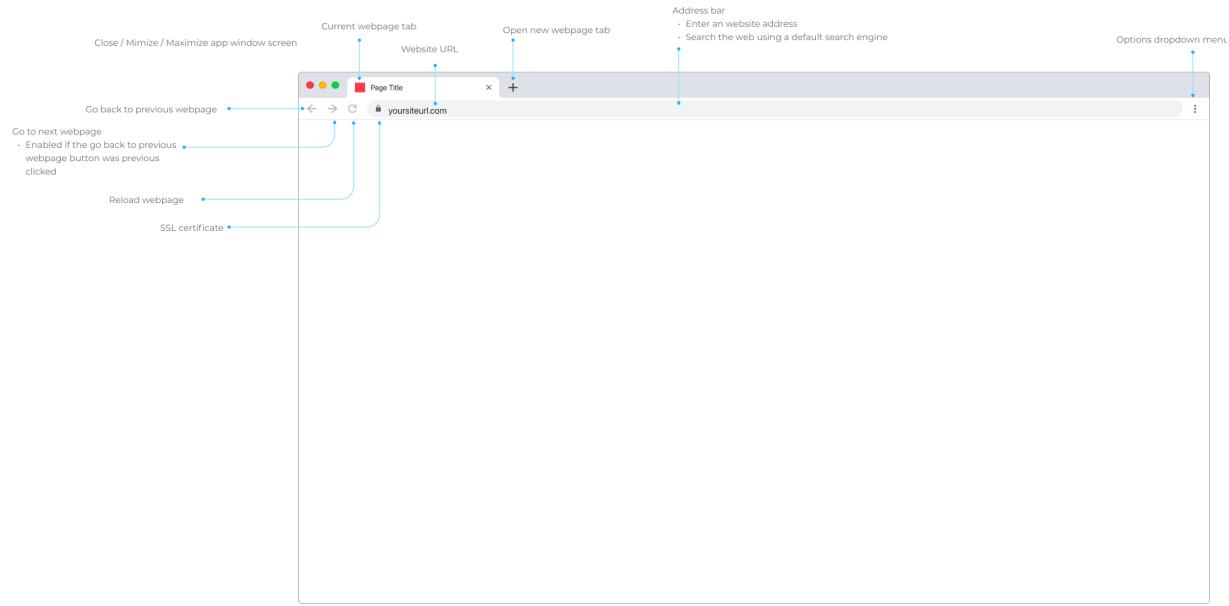


Figure 12: Google Chrome Web Browser Interface Elements

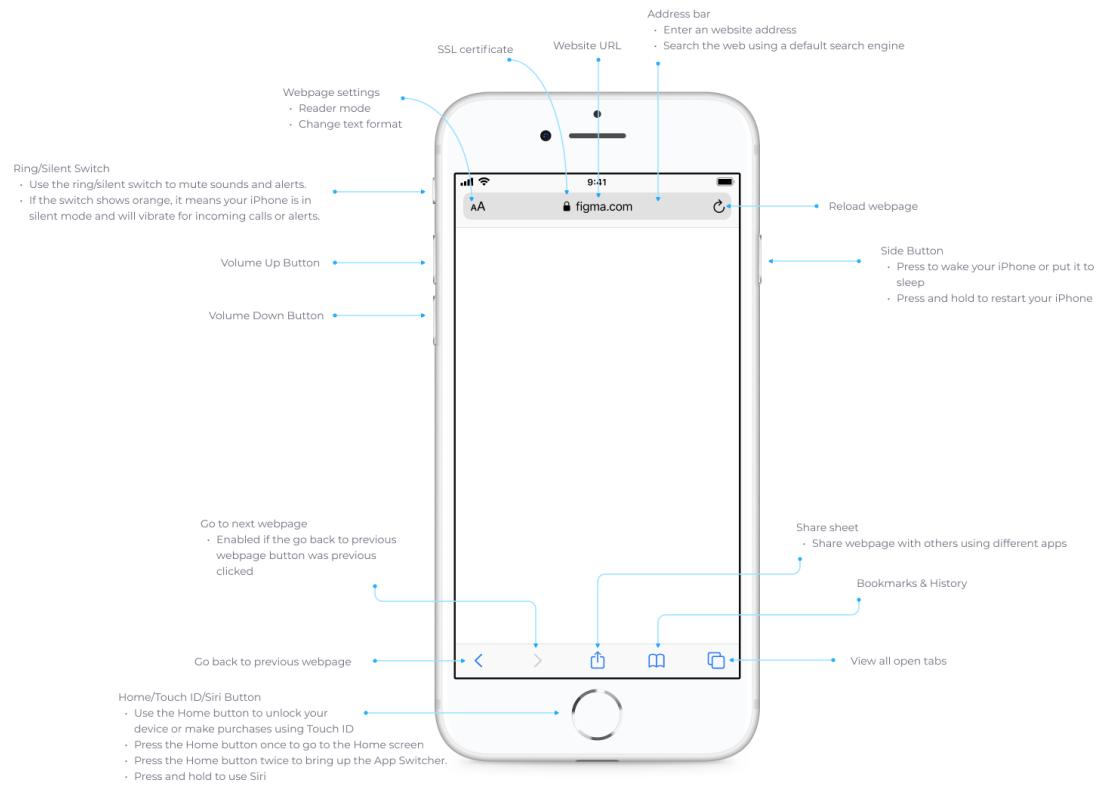


Figure 13: Apple iPhone 8 Buttons and Safari Web Browser Interface Elements



Figure 14: Apple iPhone 11 Buttons and Safari Web Browser Interface Elements

While the all user interface mockups and prototypes were created with tablet support in mind (as seen in 7.3 UI Mockups and Prototypes), this platform has not been properly tested as of yet. As such, tablet devices and their respective web browsers are currently not officially supported. Such devices will be added in future sprints.

### 7.3 UI Mockups and Prototypes

All UI mockups and associated interactive prototypes are created in Figma. The Figma is organized with the following pages: Components, Personas, Supported Devices, Research, Drafts and UI. The Components page contains all reusable UI elements - logo, form elements, buttons, etc. - which designers might need to use when designing the various mockups. The Personas page contains all the personas

information, as discussed in section 7.1 Personas. The Supported Devices page contains information about the various supported devices the application currently supports, as discussed in section 7.2 Supported Devices. The Research page is where various website links, ideas and snippets that one might have come across reside for possible future reference. The Drafts page contains UI mockups or elements that were either discarded or partially worked on. The UI page contains the finalized UI mockups and their associated interactive prototype.

A set of user interface (UI) mockups and interactive prototypes are created for each corresponding user story. The mockups are broken down into groups based on the platform they represent - desktop, tablet and mobile - resulting in a platform specific accessible and ease of use user experience. Each set of mockups are organized in the following manner: the first row describes the user flow steps for the associated user story and each subsequent row below represents various states a particular interface in any given column can have. User flow steps proceed from left to right (start to finish) while each child mockup in a given column can depict one of the following states: active, filled or error. Subsequently, once all the mockups are completed, an interactive prototype is created.

Please note, all user interface mockups and interactive prototypes related to user stories planned for sprint 3 can be found from sections 7.3.9 to 7.3.15.

### 7.3.1 Sign Up

*COV-42 - As a User, I want to be able to sign up, so that I can access the apps features*

An active user account is required to interact with all features in CovidTracker. As such, if the user does not have an account, they must first sign up to create an account. The sign up page is reached by a clear visible link at the bottom of the sign in page. There are two separate steps that must be completed during the sign up process: a user must fill in their personal information and secondly account information. Context awareness is provided to the user by way of a wizard at the top of the form highlighting the associated icon and text corresponding to the step the user is currently in during the sign up process. Such an element also helps users have a clear visible guideline

regarding how many steps are required to be completed. The UI does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 15 and 16. All UI mockups, user flow and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Sign Up / Desktop & Tablet](#)
- [UI and User Flow Mockup - Sign Up / Mobile](#)
- ► [Prototype - Sign Up / Desktop & Tablet](#)
- ► [Prototype - Sign Up / Mobile](#)

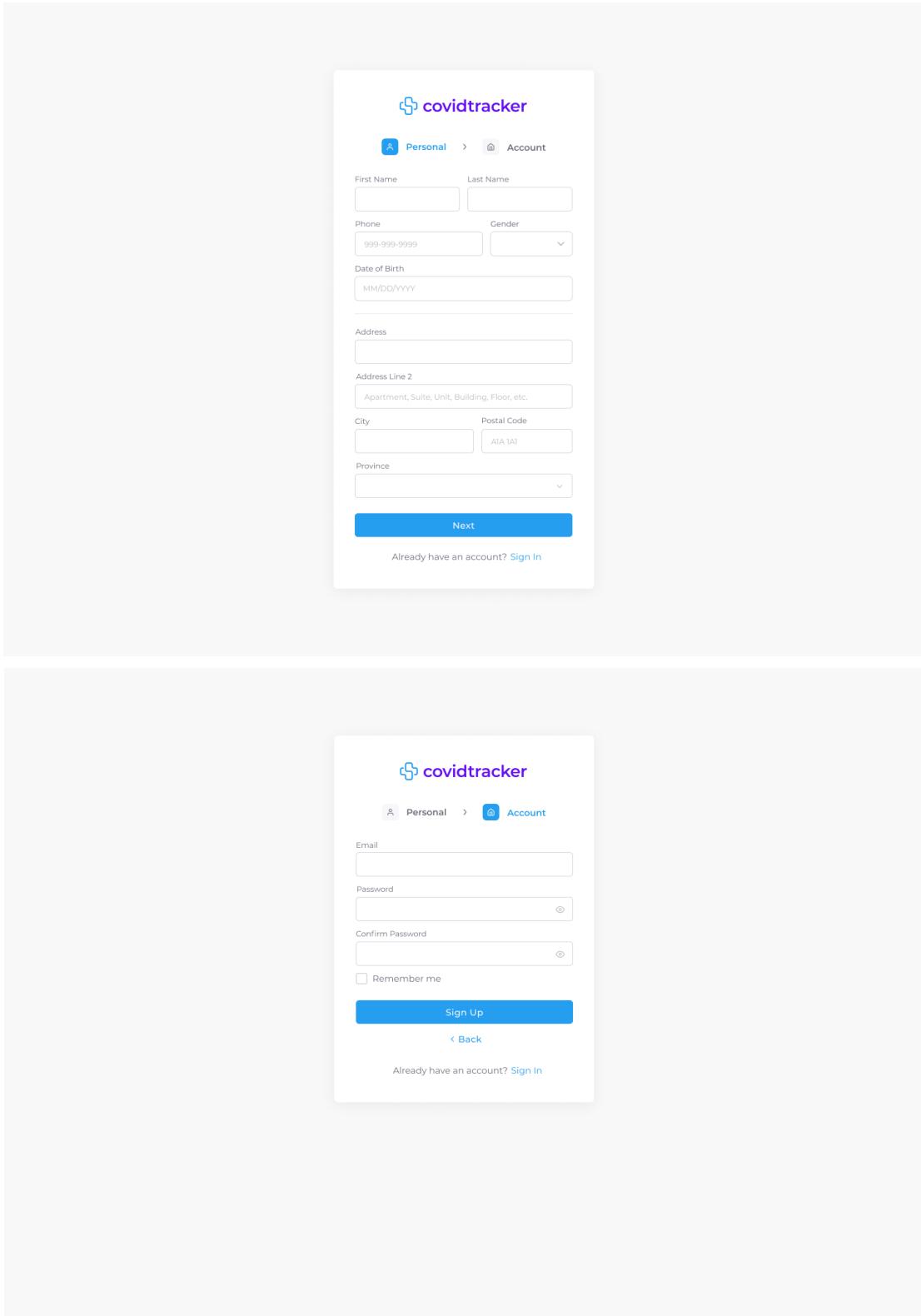


Figure 15: Sign Up Desktop & Tablet UI Mockup

**covidtracker**

Personal > Account

First Name

Last Name

Phone

Gender

Date of Birth

Address

Address Line 2

City

Postal Code

Province

**Next**

Already have an account? [Sign In](#)

**covidtracker**

Personal > Account

Email

Password

Confirm Password

Remember me

**Sign Up**

< Back

Already have an account? [Sign In](#)

Figure 16: Sign Up Mobile UI Mockup

### 7.3.2 Sign In

COV-48 - *As a User, I want to be able to sign in, so that I can access my account*

A non logged in user is automatically redirected to the sign in page when trying to access the CovidTracker website. The UI does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 17 and 18. All UI mockups, user flow and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Sign In / Desktop & Tablet](#)
- [UI and User Flow Mockup - Sign In / Mobile](#)
- [► Prototype - Sign In / Desktop & Tablet](#)
- [► Prototype - Sign In / Mobile](#)

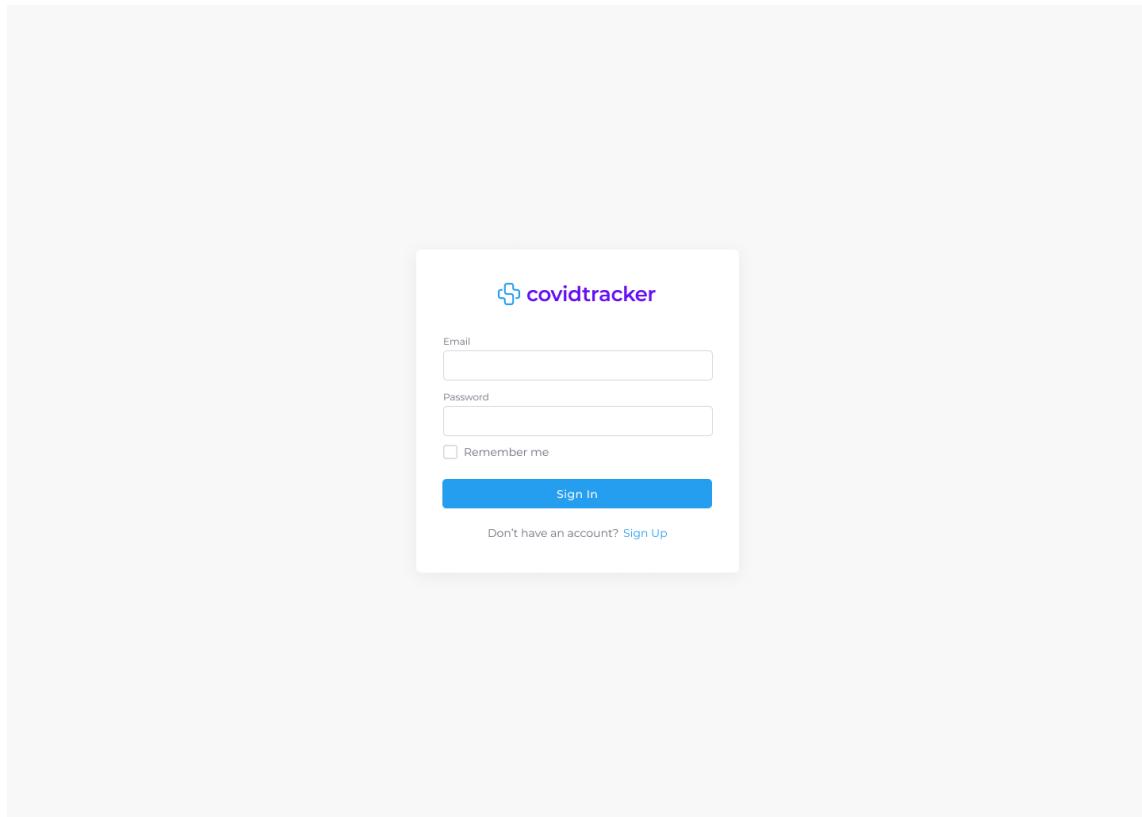


Figure 17: Sign In Desktop & Tablet UI Mockup

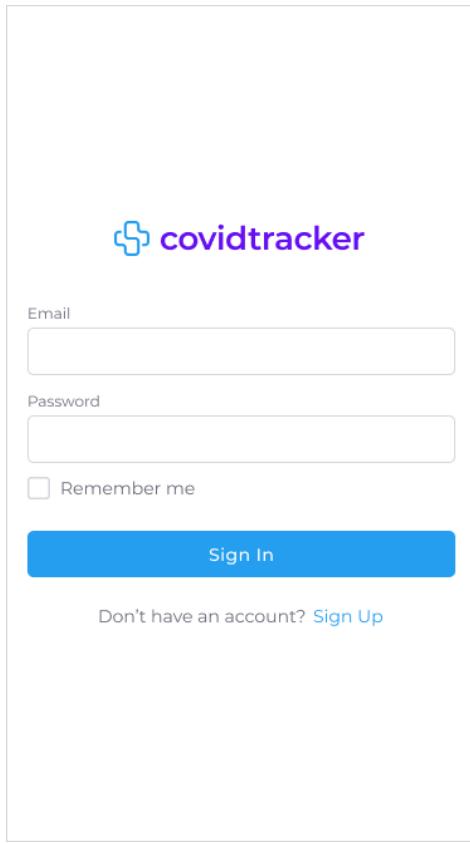


Figure 18: Sign In Mobile UI Mockup

### 7.3.3 Sign Out

*COV-52 - As a User, I want to be able to sign out, so that I can delete my session*

A user is only able to sign out of their account if they are currently signed in. The UI does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 19 and 20. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Sign Out / Desktop & Tablet](#)
- [UI and User Flow Mockup - Sign Out / Mobile](#)
- [► Prototype - Sign Out / Desktop & Tablet](#)
- [► Prototype - Sign Out / Mobile](#)

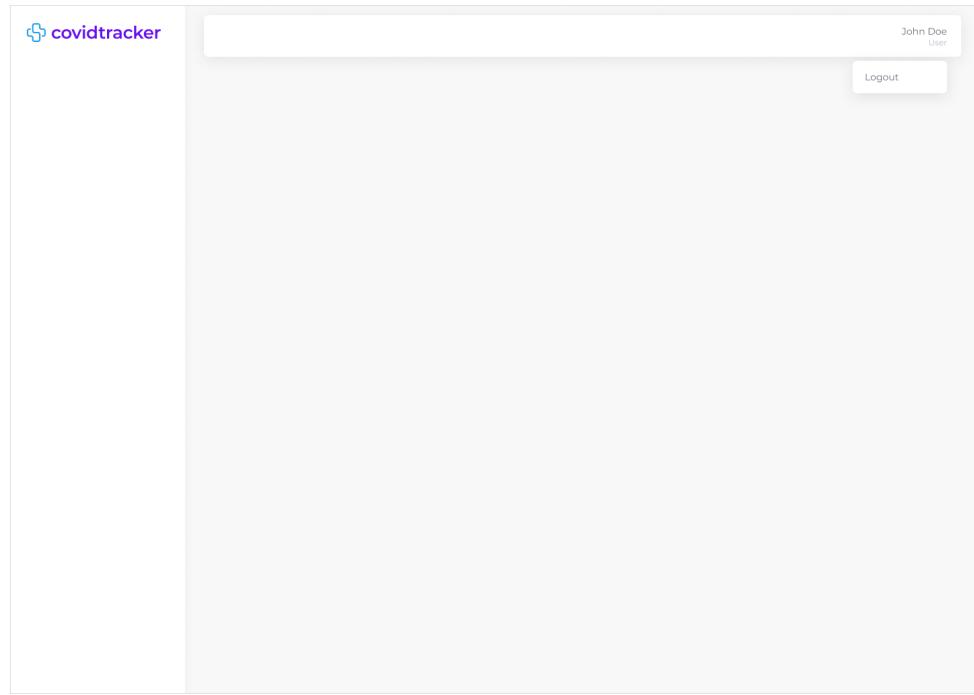


Figure 19: Sign Out Desktop & Tablet UI Mockup

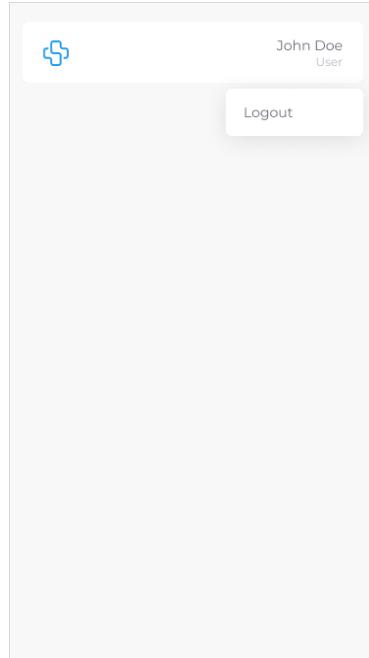


Figure 20: Sign Out Mobile UI Mockup

### 7.3.4 Add a Role

COV-85 - *As an Administrator, I want to assign a role to a user, so that I can manage access rights*

An administrator is able to assign a role to a user using their user id. A user can be assigned one of the following roles: Patient, Doctor, Health Official, Immigration Officer, or Administrator. Once assigned a role, a user has access to certain functionalities deemed appropriate for said role in CovidTracker. A user cannot be assigned more than one role at any time. The UI is only accessible by the Administrator persona and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 21 and 22. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Add a Role / Desktop & Tablet](#)
- [UI and User Flow Mockup - Add a Role / Mobile](#)
- [► Prototype - Add a Role / Desktop & Tablet](#)
- [► Prototype - Add a Role / Mobile](#)

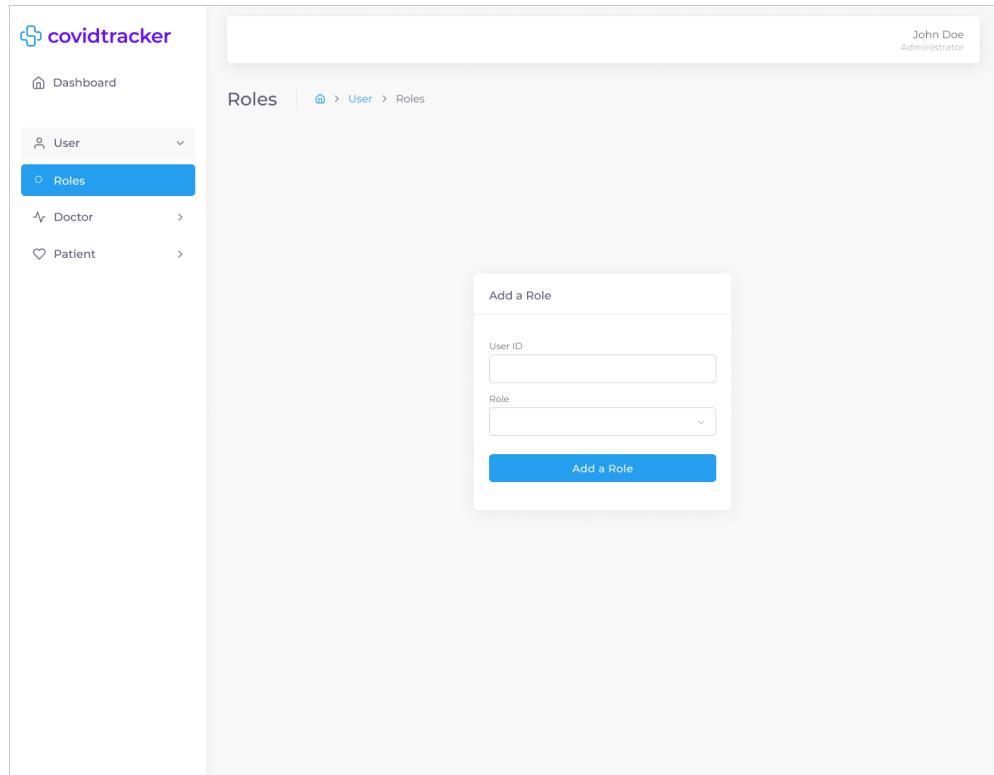


Figure 21: Add a Role Desktop & Tablet UI Mockup

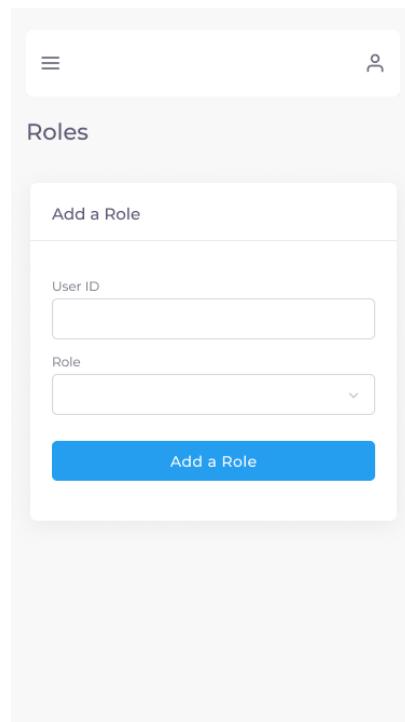


Figure 22: Add a Role Mobile UI Mockup

### 7.3.5 Assign Patient to Doctor

*COV-26 - As an Administrator, I want to assign a Patient to a Doctor, so that I can manage the Patients*

An administrator is able to assign a patient to a doctor using both the patient and doctor ids, respectively. A patient can only be assigned to a single doctor at a given time. The UI is only accessible by the Administrator persona and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 23 and 24. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Assign Patient to Doctor / Desktop & Tablet](#)
- [UI and User Flow Mockup - Assign Patient to Doctor / Mobile](#)
- ► [Prototype - Assign Patient to Doctor / Desktop & Tablet](#)
- ► [Prototype - Assign Patient to Doctor / Mobile](#)

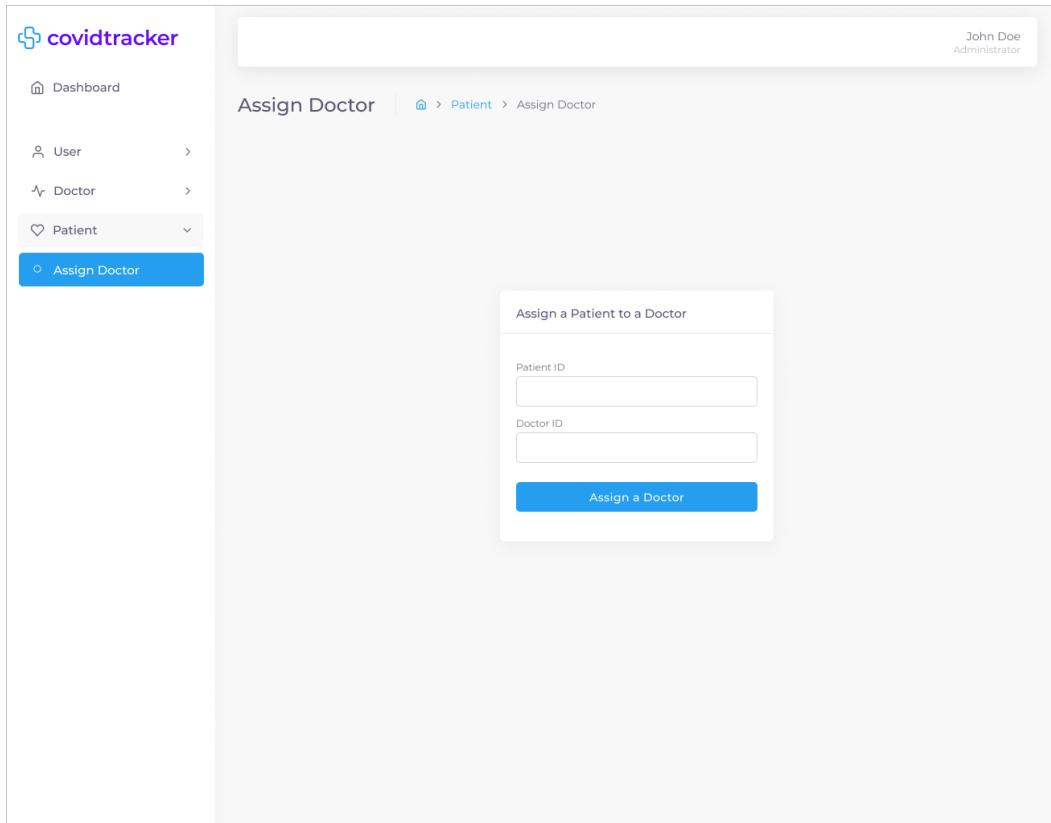


Figure 23: Assign Patient to Doctor Desktop & Tablet UI Mockup

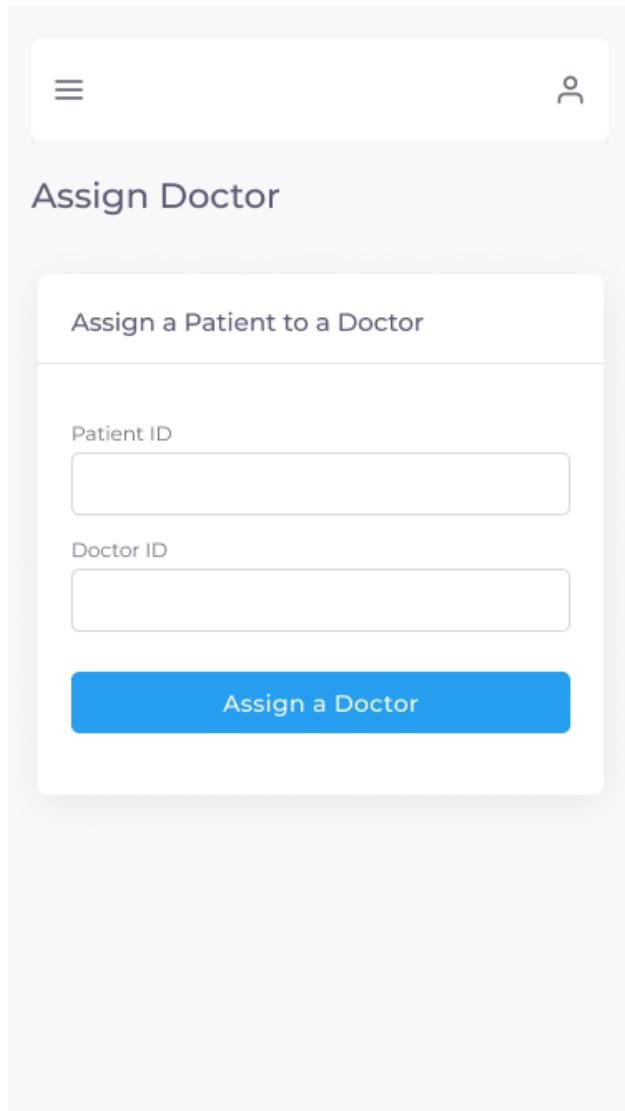


Figure 24: Assign Patient to Doctor Mobile UI Mockup

### 7.3.6 Define Status Report

*COV-95 - As a Doctor, I want to define the status report fields for my Patients, so I can properly track them*

A doctor is able to assign a unique status report to each assigned patient. The “Define Status Report” form allows a doctor to choose specific status report fields which must be filled up by the assigned patient of said report. The fields are classified as either general or symptoms (primary and secondary). General fields are pre-selected for the doctor as they are mandatory whereas the symptom fields are up to the doctors discretion. A status report is unique for each assigned patient. In other words, certain fields might not need to be filled up by certain patients compared to others. The UI is only accessible by the Doctor persona and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 25 and 26. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Define Status Report / Desktop & Tablet](#)
- [UI and User Flow Mockup - Define Status Report / Mobile](#)
- ► [Prototype - Define Status Report / Desktop & Tablet](#)
- ► [Prototype - Define Status Report / Mobile](#)

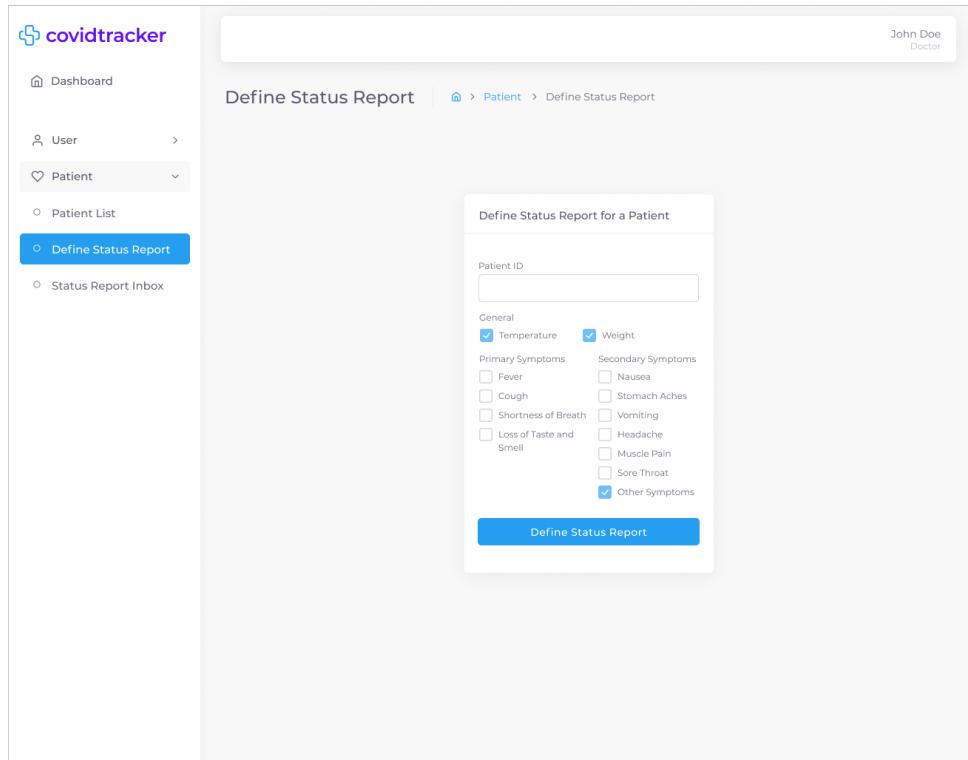


Figure 25: Define Status Report Desktop & Tablet UI Mockup

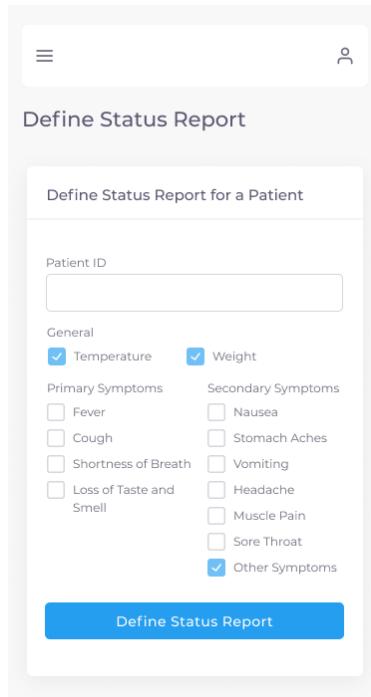


Figure 26: Define Status Report Mobile UI Mockup

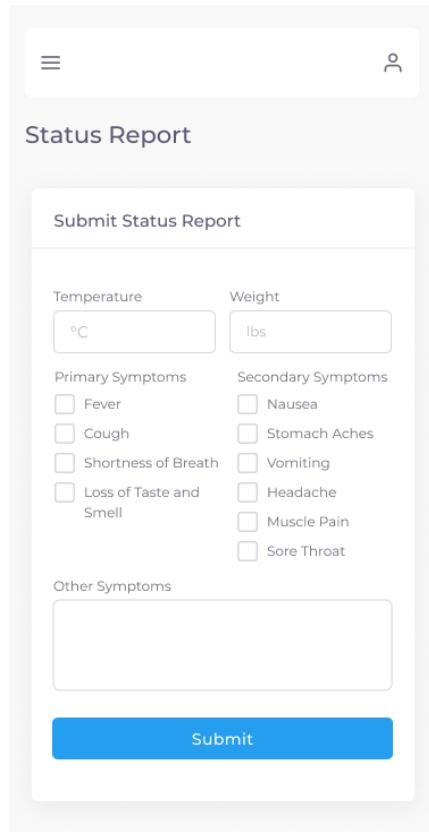
### 7.3.7 Status Report

*COV-25 - As a Patient, I want to submit my status, so that I can keep my Doctor updated*

Once a patient is assigned a status report by their doctor due to a positive test result, they must fill up their report daily until no longer required to. The status report form fields displayed are adjusted per patient based on the chosen options defined by the doctor as described in section 7.3.6 Define Status Report. Therefore, the status report that a patient must fill out will only display the fields the doctor selects. For example, if a doctor deems secondary symptoms as unnecessary to be filled up by a patient then said patient will not see that option in their daily status report. The UI is only accessible by the Patient persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 27 and 28. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Status Report / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Report / Mobile](#)
- ► [Prototype - Status Report / Desktop & Tablet](#)
- ► [Prototype - Status Report / Mobile](#)

Figure 27: Status Report Desktop & Tablet UI Mockup



A mobile application interface titled "Status Report". At the top, there are three horizontal lines and a circular icon. Below the title, a button labeled "Submit Status Report" is visible. The form is divided into sections: "Temperature" with input fields for °C and lbs, "Primary Symptoms" (checkboxes for Fever, Cough, Shortness of Breath, Loss of Taste and Smell), "Secondary Symptoms" (checkboxes for Nausea, Stomach Aches, Vomiting, Headache, Muscle Pain, Sore Throat), and "Other Symptoms" (a large text input field). A blue "Submit" button is located at the bottom.

Figure 28: Status Report Mobile UI Mockup

### 7.3.8 Number of Patients Assigned to a Doctor

*COV-27 - As an Administrator, I want to view the number of Patients assigned to a Doctor, so that no Doctor has too many Patients*

An administrator is able to view a table containing all doctors and the number of patients assigned to them. There are also two information cards above the table describing the total number of patients assigned to all doctors and the number of assigned patients per doctor. The UI is only accessible by the Administrator persona and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 29 and 30. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Number of Patients Assigned to a Doctor / Desktop & Tablet](#)
- [UI and User Flow Mockup - Number of Patients Assigned to a Doctor / Mobile](#)
- ► [Prototype - Number of Patients Assigned to a Doctor / Desktop & Tablet](#)
- ► [Prototype - Number of Patients Assigned to a Doctor / Desktop & Tablet](#)

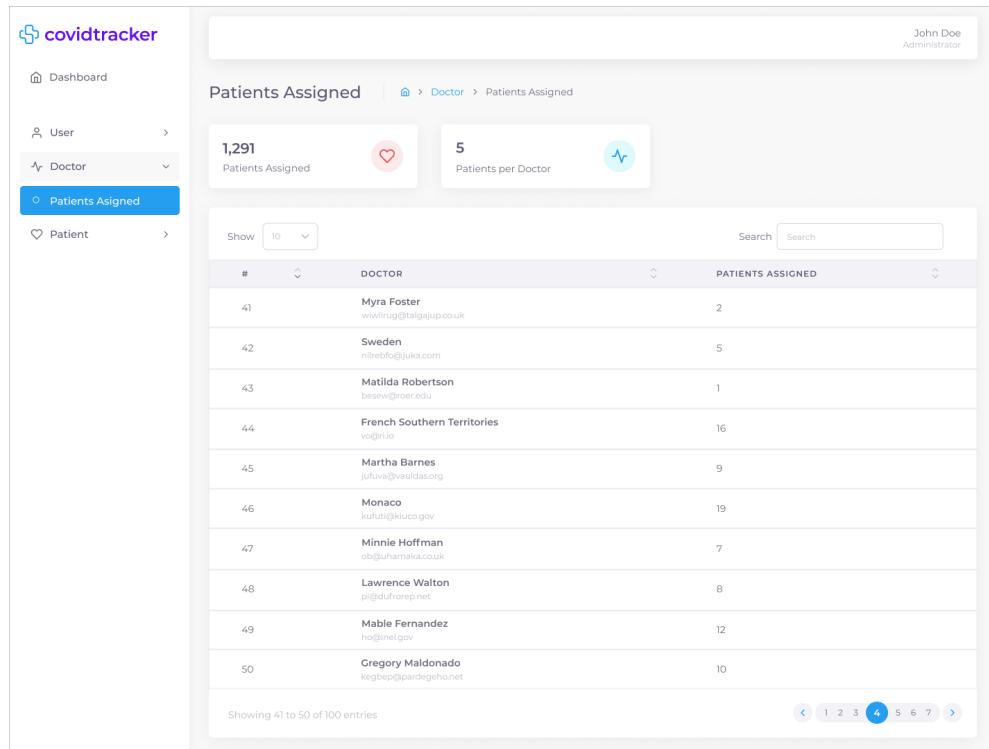


Figure 29: Number of Patients Assigned to a Doctor Desktop & Tablet UI Mockup

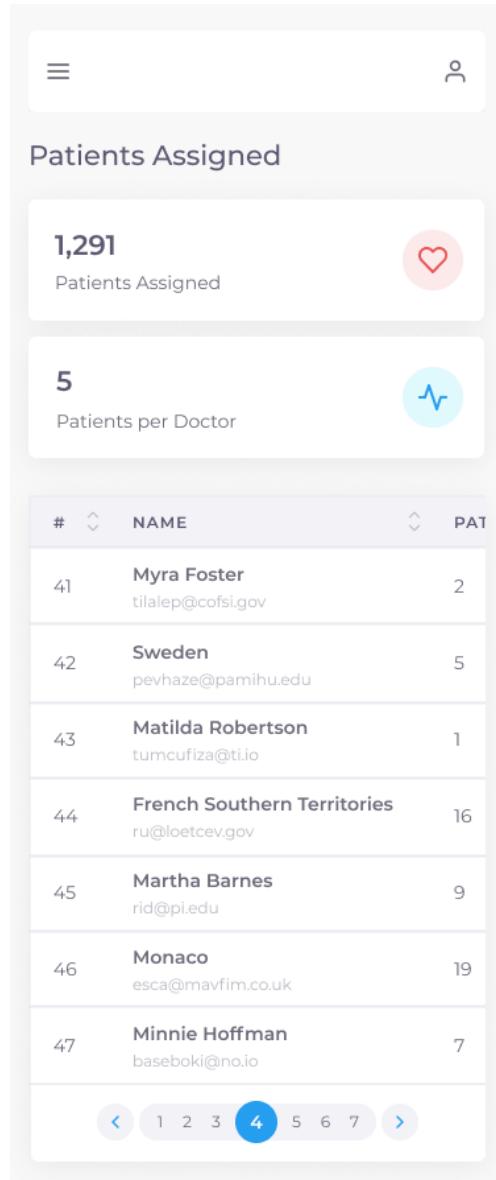


Figure 30: Number of Patients Assigned to a Doctor Mobile UI Mockup

### 7.3.9 Patient List

*COV-114 - As a Doctor, I want to flag certain patients, so that their updates are prioritized over others*

*COV-157 - As a Doctor, I want to view a list of my Patients, so that I can easily navigate to their specific detailed views*

A doctor is able to view a table containing all patients they are assigned to by an administrator. A doctor can prioritize a patient by clicking the “flag” icon under the “Actions” column allowing said patient’s status reports to be prioritized over other patients. A doctor can also click the “more options” (three dots) icon and choose one of the following actions: add a test result for a patient, view a patient’s test results, and view a patient’s status reports. This page is also accessible to a health official and likewise a health official has the same abilities as a doctor would such as prioritization, adding a test result, and viewing all test results and status reports. The only adjustment between both personas is the health official will see a list of all patients in the system and a doctor only sees their assigned patients. Therefore, the UI is only accessible by the Doctor, and Health Official personas. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 31 and 32. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Patient List / Desktop & Tablet](#)
- [UI and User Flow Mockup - Patient List / Mobile](#)
- ► [Prototype - Patient List / Desktop & Tablet](#)
- ► [Prototype - Patient List / Mobile](#)

The image shows a user interface for a medical application named "covidtracker". The left sidebar has a navigation menu with options: Dashboard, User, Patient (selected), Define Status Report, and Status Report Inbox. The main content area is titled "Patient List" and shows a table of patient records. The table columns are: #, NAME, ADDRESS, DATE OF BIRTH, GENDER, PHONE, and ACTIONS. The table contains 10 entries, numbered 41 to 50. Each entry includes a patient's name, address (Waverly Street, Montreal, QC A1A 1A1, Canada), date of birth, gender (Female or Male), phone number, and an "Actions" button. The table also includes a search bar at the top right and a pagination control at the bottom.

#	NAME	ADDRESS	DATE OF BIRTH	GENDER	PHONE	ACTIONS
41	<b>Myra Foster</b> www.lirug@talgaup.co.uk	1 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jan 1990	Female	514-111-1111	
42	<b>Sweden</b> nilrebfo@juka.com	2 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jan 1991	Male	514-222-2222	
43	<b>Matilda Robertson</b> besew@rore.edu	3 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jun 1993	Female	514-333-3333	
44	<b>French Southern Territories</b> voqan.io	4 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jul 2000	Male	514-444-4444	
45	<b>Martha Barnes</b> jufuva@vauldas.org	5 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jul 2002	Female	514-555-5555	
46	<b>Monaco</b> kufuti@kiuco.gov	6 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jul 2005	Male	514-666-6666	
47	<b>Minnie Hoffman</b> ob@uhamaka.co.uk	7 Waverly Street Montreal, QC A1A 1A1 Canada	01 Jul 2007	Female	514-777-7777	

Showing 40 to 50 of 100 entries

Figure 31: Patient List Desktop & Tablet UI Mockup

The image shows a mobile application interface titled "Patient List". At the top, there is a navigation bar with three horizontal lines on the left and a user profile icon on the right. Below the title, there is a table with the following columns: #, NAME, and ADI. The table contains five rows of data, each with a row number (41, 42, 43, 44, 45) and a patient name. The names are: Myra Foster, Sweden, Matilda Robertson, French Southern Territories, and Martha Barnes. Each row also includes an email address and a partially visible column labeled "ADI". At the bottom of the table, there is a pagination control with numbers 1 through 7, where the number 4 is highlighted in blue.

#	NAME	ADI
41	Myra Foster tilalep@cofsi.gov	1 W Mo Car
42	Sweden pevhaze@pamihu.edu	2 W Mo Car
43	Matilda Robertson tumcufliza@ti.io	3 W Mo Car
44	French Southern Territories ru@loetcev.gov	4 W Mo Car
45	Martha Barnes rid@pi.edu	5 W Mo Car

Figure 32: Patient List Mobile UI Mockup

### 7.3.10 Status Reports

*COV-111 - As a Patient, I want to view all my line item statuses, so that I can monitor my progress over time*

A patient is able to view a table containing all the status reports submitted to their doctor. By clicking the “see details” (eye) icon under the “Actions” column, a patient would be able to see a full description of the status report as described in section 7.3.13 Status Report Details. A doctor and health official can also view a similar page upon selecting the “Status Reports” option found in the more options dropdown for a given patient within the Patient List page as described in section 7.3.9 Patient List. Therefore, the UI is only accessible by the Patient, Doctor and Health Official personas. The only UI element that adjusts based on the persona is the breadcrumb text. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 33 and 34 for the Patient person and Figures 35 and 36 for the Doctor and Health Official personas. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Status Reports \(Patient\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Reports \(Patient\) / Mobile](#)
- [► Prototype - Status Reports \(Patient\) / Desktop & Tablet](#)
- [► Prototype - Status Reports \(Patient\) / Mobile](#)

#	LAST UPDATED	WEIGHT	TEMPERATURE	SYMPOMTS	SYMPOMTS	ACTIONS
123411	01 Jan 2022, 1:00 PM	150 lbs	34 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque condim...	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque condim...	
123412	19 Dec 2021, 1:00 PM	120 lbs	45 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit.	Lore ipsum dolor sit amet, consectetur adipiscing elit.	
123413	16 Dec 2021, 1:00 PM	119 lbs	32 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque ndiment...	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque ndiment...	
123414	5 Dec 2021, 1:00 PM	250 lbs	39 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123415	20 Nov 2021, 1:00 PM	160 lbs	35.5 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123416	05 Nov 2021, 1:00 PM	189 lbs	38.2 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123417	19 Oct 2021, 1:00 PM	180.5 lbs	34.1 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123418	05 Sep 2021, 1:00 PM	199 lbs	42.1 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123419	01 Aug 2021, 1:00 PM	100 lbs	43.9 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123420	06 July 2021, 1:00 PM	120 lbs	35 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	

Showing 40 to 50 of 100 entries

Figure 33: Status Reports (Patient) Desktop & Tablet UI Mockup

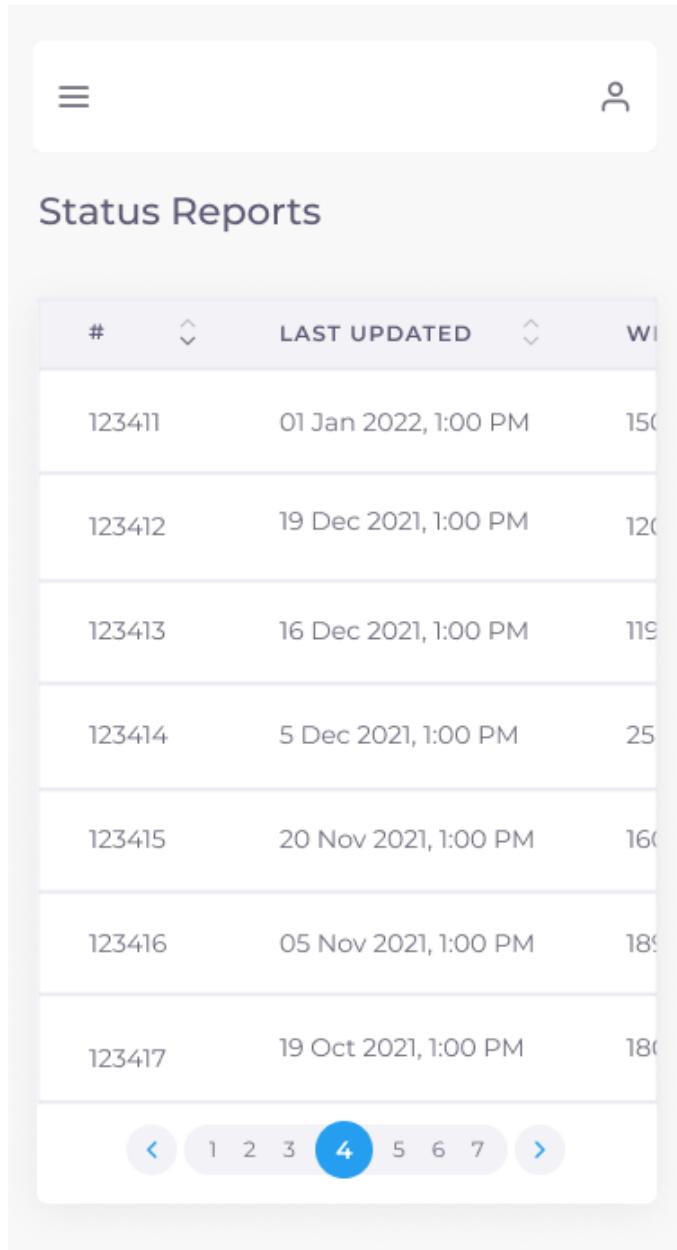


Figure 34: Status Reports (Patient) Mobile UI Mockup

- [UI and User Flow Mockup - Status Reports \(Doctor/Health Official\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Reports \(Doctor/Health Official\) / Mobile](#)
- ► [Prototype - Status Reports \(Doctor/Health Official\) / Desktop & Tablet](#)
- ► [Prototype - Status Reports \(Doctor/Health Official\) / Mobile](#)

The desktop UI mockup shows a sidebar with 'covidtracker' logo, navigation links for Dashboard, User, Patient (selected), Patient List (highlighted in blue), Define Status Report, and Status Report Inbox. The main area displays 'Myra Foster's Status Reports' with a breadcrumb trail: Home > Patient > Patient List > Status Reports. A table lists 10 status reports from 123411 to 123420, showing columns for #, Last Updated, Weight, Temperature, Symptoms, Other Symptoms, and Actions. The table includes a 'Show' dropdown set to 10, a pagination bar at the bottom, and a header with 'John Doe Doctor'.

#	LAST UPDATED	WEIGHT	TEMPERATURE	SYMPOMTS	OTHER SYMPTOMS	ACTIONS
123411	01 Jan 2022, 1:00 PM	150 lbs	34 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque condim...	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque condim...	
123412	19 Dec 2021, 1:00 PM	120 lbs	45 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit.	Lore ipsum dolor sit amet, consectetur adipiscing elit.	
123413	16 Dec 2021, 1:00 PM	119 lbs	32 °C	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque ndiment...	Lore ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque ndiment...	
123414	5 Dec 2021, 1:00 PM	250 lbs	39 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123415	20 Nov 2021, 1:00 PM	160 lbs	35.5 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123416	05 Nov 2021, 1:00 PM	189 lbs	38.2 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123417	19 Oct 2021, 1:00 PM	180.5 lbs	34.1 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123418	05 Sep 2021, 1:00 PM	199 lbs	42.1 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123419	01 Aug 2021, 1:00 PM	100 lbs	43.9 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	
123420	06 July 2021, 1:00 PM	120 lbs	35 °C	Lore ipsum dolor sit amet, consectetur.	Lore ipsum dolor sit amet, consectetur.	

Figure 35: Status Reports (Doctor/Health Official) Desktop & Tablet UI Mockup

The mobile UI mockup shows a header with a menu icon (three horizontal lines) and a search icon (magnifying glass). The main title is 'Myra Foster's Status Reports'. Below it is a table with the same 10 status reports as the desktop version, but with truncated data. At the bottom is a pagination bar with numbers 1 through 7, where '4' is highlighted in blue.

#	LAST UPDATED	WI
123411	01 Jan 2022, 1:00 PM	150
123412	19 Dec 2021, 1:00 PM	120
123413	16 Dec 2021, 1:00 PM	119
123414	5 Dec 2021, 1:00 PM	25
123415	20 Nov 2021, 1:00 PM	160
123416	05 Nov 2021, 1:00 PM	189
123417	19 Oct 2021, 1:00 PM	180

Figure 36: Status Reports (Doctor/Health Official) Mobile UI Mockup

### 7.3.11 Add Test Result

*COV-107 - As a Health Official, I want to input my COVID test results, so that I can report if a Patient tested positive or negative*

A health official and doctor are able to add a test result for a given patient. The following information must be provided: test result (positive or negative), type of test (antigen or PCR), date of test, and location of test. This page can be accessed from the Patient List by selecting the “Add Test Result” option found in the more options dropdown for a given patient as described in section 7.3.9 Patient List. The UI is only accessible by the Doctor and Health Official personas and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 37 and 38. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Add Test Result / Desktop & Tablet](#)
- [UI and User Flow Mockup - Add Test Result / Mobile](#)
- ► [Prototype - Add Test Result / Desktop & Tablet](#)
- ► [Prototype - Add Test Result / Mobile](#)

The screenshot displays the covidtracker application's user interface for adding a test result. On the left, a sidebar menu shows 'Dashboard', 'User' (with 'Patient' selected), 'Patient List' (which is highlighted in blue), 'Define Status Report', and 'Status Report Inbox'. The main content area is titled 'Add Test Result for Myra Foster' and includes a breadcrumb trail: Home > Patient > Patient List > Add Test Result. A sub-modal window titled 'Add a Test Result' contains fields for 'Test Result' (radio buttons for Positive or Negative), 'Type of Test' (dropdown), 'Date of Test' (date picker), 'Address' (text input), 'Address Line 2' (text input), 'City' (text input), 'Postal Code' (text input with value 'A1A 1A1'), and 'Province' (dropdown). A large blue 'Add a Test Result' button is at the bottom of the modal.

Figure 37: Add Test Result Desktop & Tablet UI Mockup

The image shows a mobile application interface for adding a test result. At the top, there is a header with a menu icon (three horizontal lines) and a user profile icon. Below the header, the title "Add Test Result for Myra Foster" is displayed. The main form area is titled "Add a Test Result". It contains the following fields:

- Test Result (dropdown)
- Type of Test (dropdown)
- Date of Test (text input: MM/DD/YYYY 00:00 AM/PM)
- Address (text input)
- Address Line 2 (text input: Apartment, Suite, Unit, Building, Floor, etc.)
- City (text input)
- Postal Code (text input: A1A 1A1)
- Province (dropdown)

At the bottom of the form is a blue button labeled "Add a Test Result".

Figure 38: Add Test Result Mobile UI Mockup

### 7.3.12 Status Report Inbox

*COV-113 - As a Doctor, I want to view a line item list of my patients with their most recent line item status update, so that I can keep track of any updates*

*COV-115 - As a Doctor, I want to mark a Patient's status update as "Reviewed", so that I can see which statuses I've already seen*

A doctor is able to view a table containing all status reports submitted by all their assigned patients. A doctor can subsequently, press the checkbox to mark a status report as viewed or uncheck it to mark it as not viewed. A doctor can also click the “see details” (eye) icon under the “Actions” column to view a full description of the status report as described in section 7.3.13 Status Report Details. The UI is only accessible by the Doctor persona and does not adjust based on persona. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 39 and 40. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Status Report Inbox / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Report Inbox / Mobile](#)
- ► [Prototype - Status Report Inbox / Desktop & Tablet](#)
- ► [Prototype - Status Report Inbox / Mobile](#)

ID	Name	Weight	Temperature	Last Updated	Actions
123420	Myra Foster myr@foster.com	150 lbs	34 °C	01 Jan 2022, 1:00 PM	<input type="checkbox"/>
123419	Sweden sweden@juka.com	120 lbs	45 °C	19 Dec 2021, 1:00 PM	<input type="checkbox"/>
123418	Matilda Robertson matilda@robertson.edu	119 lbs	32 °C	16 Dec 2021, 1:00 PM	<input type="checkbox"/>
123417	French Southern Territories fso@france.fr	250 lbs	39 °C	5 Dec 2021, 1:00 PM	<input type="checkbox"/>
123416	Martha Barnes martha.barnes@barnes.org	160 lbs	35.5 °C	20 Nov 2021, 1:00 PM	<input type="checkbox"/>
123415	Monaco monaco@europa.eu	189 lbs	38.2 °C	05 Nov 2021, 1:00 PM	<input type="checkbox"/>
123414	Minnie Hoffman minnie.hoffman@hawaii.gov	180.5 lbs	34.1 °C	19 Oct 2021, 1:00 PM	<input type="checkbox"/>
123413	Lawrence Walton lawrence.walton@walton.net	199 lbs	42.1 °C	05 Sep 2021, 1:00 PM	<input type="checkbox"/>
123412	Mable Fernandez mable.fernandez@fernandez.gov	100 lbs	43.9 °C	01 Aug 2021, 1:00 PM	<input type="checkbox"/>
123411	Gregory Maldonado greg.maldonado@maldonado.net	120 lbs	35 °C	06 July 2021, 1:00 PM	<input type="checkbox"/>

Figure 39: Status Report Inbox Desktop & Tablet UI Mockup

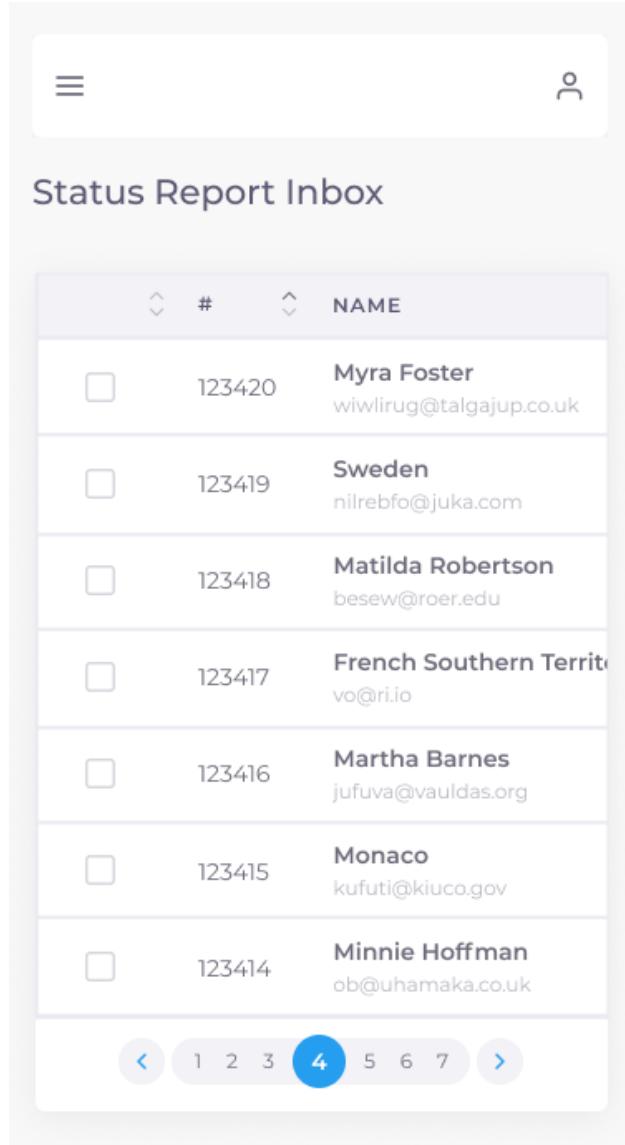


Figure 40: Status Report Inbox Mobile UI Mockup

### 7.3.13 Status Report Details

*COV-112 - As a Patient, I want to view the details of a single status report of a Patient, so that I can view their progress at a point in time*

*COV-121 - As a Patient, I want to be able to generate a QR code for a status report, so that I can share it with others*

A patient is able to view a full detailed description of a given status report and its associated QR code that can be used to easily share such information with either their doctor or a health official. Likewise, upon scanning such QR code, a doctor or health official will be redirected to a similar page. The UI is only accessible by the Patient, Doctor and Health Official personas. The only UI element that adjusts based on the persona is the breadcrumb text. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 41 and 42 for the Patient person and Figures 43 and 44 for the Doctor and Health Official personas. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Status Report Details \(Patient\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Report Details \(Patient\) / Mobile](#)
- [► Prototype - Status Report Details \(Patient\) / Desktop & Tablet](#)
- [► Prototype - Status Report Details \(Patient\) / Mobile](#)

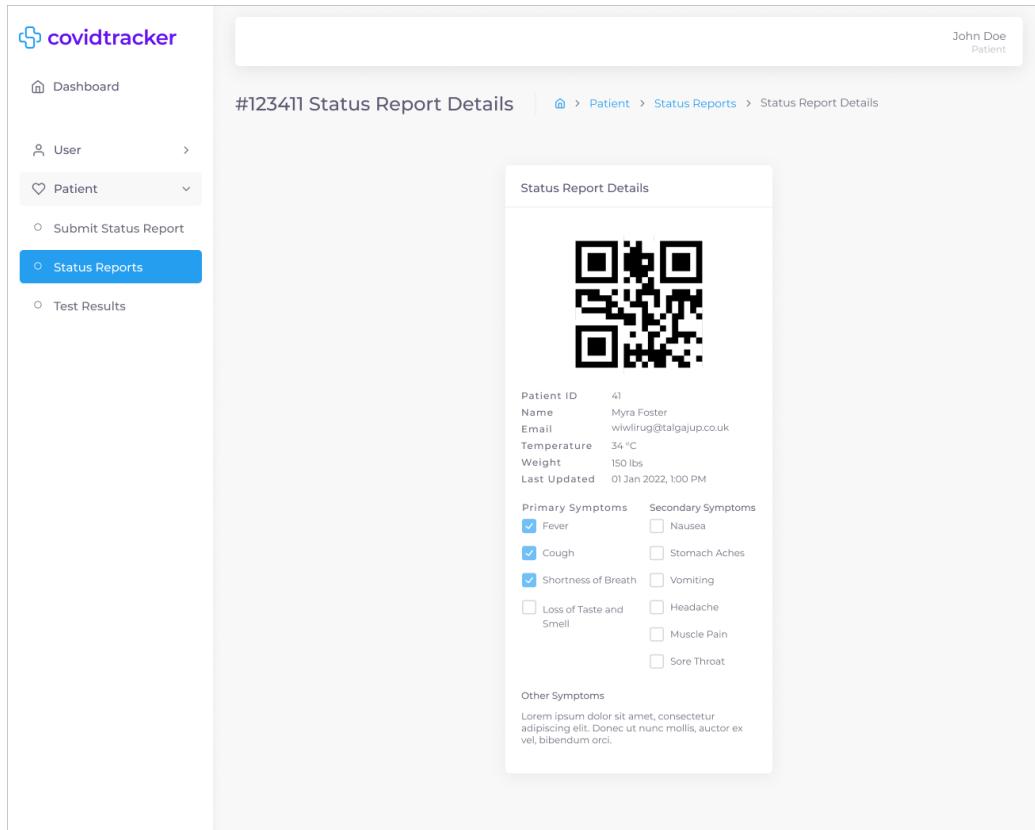


Figure 41: Status Report Details (Patient) Desktop & Tablet UI Mockup

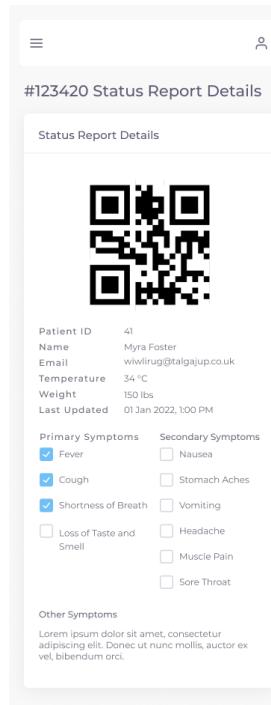


Figure 42: Status Report Details (Patient) Mobile UI Mockup

- [UI and User Flow Mockup - Status Report Details \(Doctor/Health Official\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Status Report Details \(Doctor/Health Official\) / Mobile](#)
- [► Prototype - Status Report Details \(Doctor/Health Official\) / Desktop & Tablet](#)
- [► Prototype - Status Report Details \(Doctor/Health Official\) / Mobile](#)

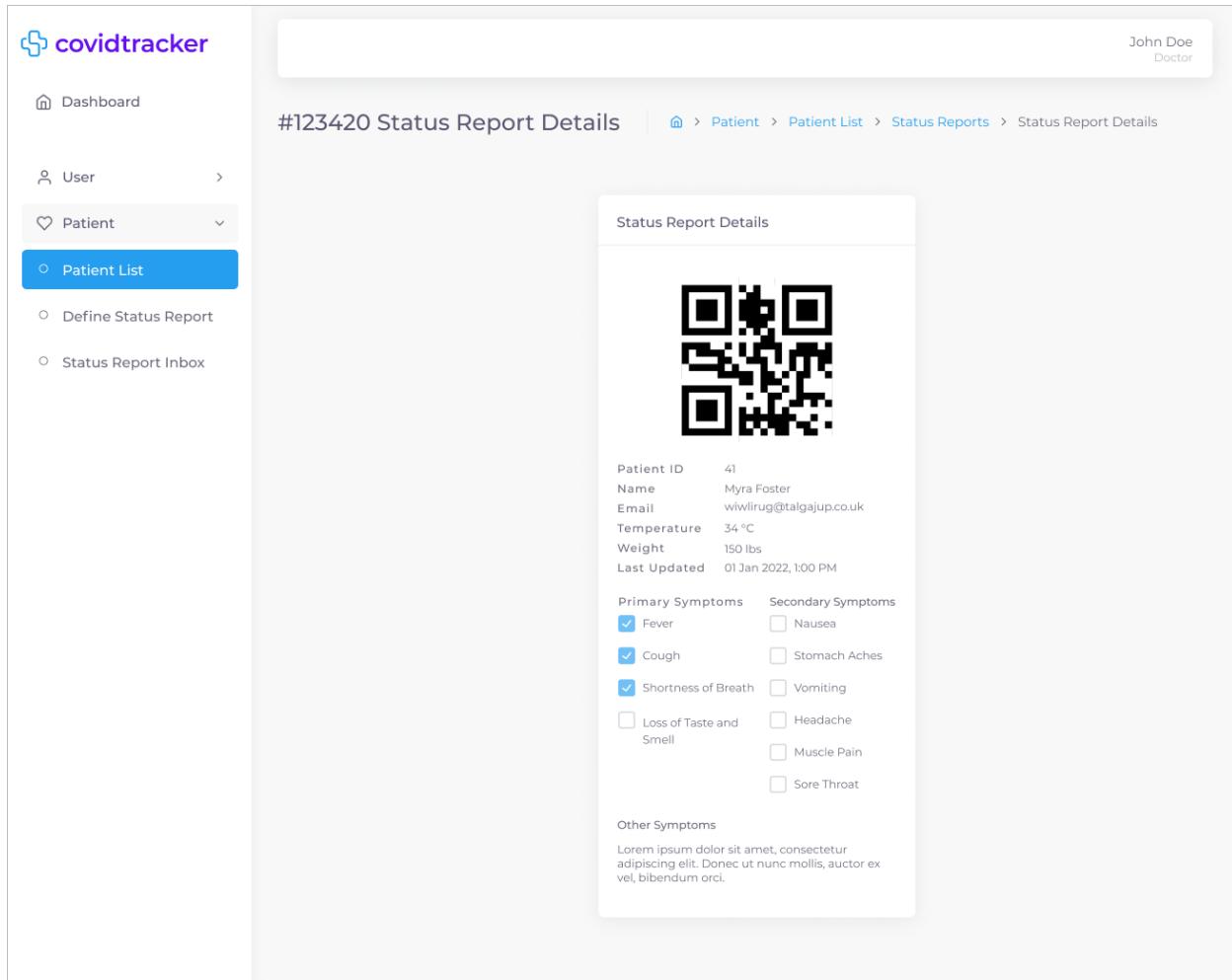


Figure 43: Status Report Details (Doctor/Health Official) Desktop & Tablet UI Mockup

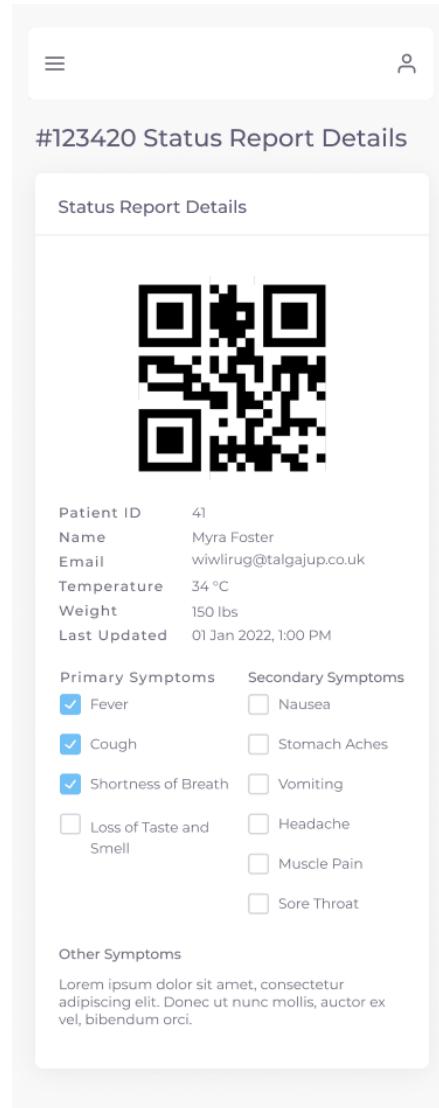


Figure 44: Status Report Details (Doctor/Health Official) Mobile UI Mockup

### 7.3.14 Test Results

*COV-123 - As a Patient, I want to view all my line item COVID test results, so that I'm aware of my diagnosis*

A patient is able to view a table containing all their test results. By clicking the “see details” (eye) icon under the “Actions” column, a patient would be able to see a full description of the test result as described in section 7.3.15 Test Result Details. A doctor and health official can also view a similar page upon selecting the “Test Results” option found in the more options dropdown for a given patient within the Patient List page as described in section 7.3.9 Patient List. Therefore, the UI is only accessible by the Patient, Doctor and Health Official personas. The only UI element that adjusts based on the persona is the breadcrumb text. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 45 and 46 for the Patient person and Figures 47 and 48 for the Doctor and Health Official personas. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Test Results \(Patient\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Test Results \(Patient\) / Mobile](#)
- [► Prototype - Test Results \(Patient\) / Desktop & Tablet](#)
- [► Prototype - Test Results \(Patient\) / Mobile](#)

The image displays a side-by-side comparison of the covidtracker Test Results (Patient) interface, designed for both desktop and tablet devices.

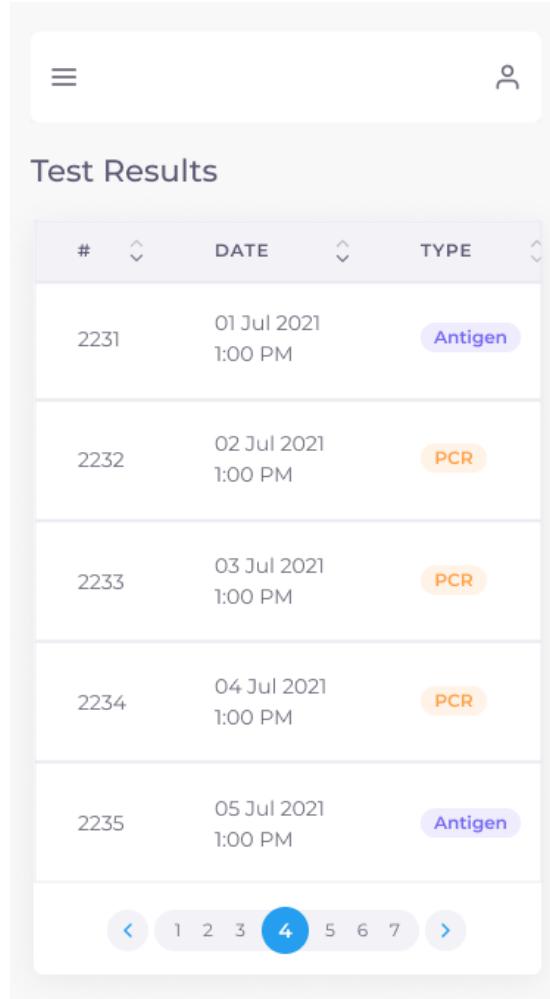
**Desktop View:**

- Header:** Shows the "covidtracker" logo and a "Patient" section with "John Doe" and "Patient" details.
- Breadcrumbs:** "Test Results" > "Patient" > "Test Results".
- Search Bar:** "Search" with a placeholder "Search".
- Table Headers:** "#", DATE, TYPE, RESULT, ADDRESS, ACTIONS.
- Data Rows:** 7 rows of test results from July 1st to July 7th, 2021, at 1:00 PM. Each row includes the test ID, date, type (Antigen or PCR), result (Positive or Negative), address (1 Waverly Street, Montreal, QC A1A 1A1, Canada), and an "Actions" button.
- Pagination:** Shows "Showing 40 to 50 of 100 entries" and a page navigation bar with numbers 1, 2, 3, 4, 5, 6, 7, and arrows.

**Tablet View:**

- Header:** Shows the "covidtracker" logo and a "Patient" section with "John Doe" and "Patient" details.
- Breadcrumbs:** "Test Results" > "Patient" > "Test Results".
- Search Bar:** "Search" with a placeholder "Search".
- Table Headers:** "#", DATE, TYPE, RESULT, ADDRESS, ACTIONS.
- Data Rows:** 7 rows of test results from July 1st to July 7th, 2021, at 1:00 PM. Each row includes the test ID, date, type (Antigen or PCR), result (Positive or Negative), address (1 Waverly Street, Montreal, QC A1A 1A1, Canada), and an "Actions" button.
- Pagination:** Shows "Showing 40 to 50 of 100 entries" and a page navigation bar with numbers 1, 2, 3, 4, 5, 6, 7, and arrows.

Figure 45: Test Results (Patient) Desktop & Tablet UI Mockup



A mobile application interface titled "Test Results". At the top, there are three horizontal lines and a user profile icon. Below the title, there is a header row with columns labeled "#", "DATE", and "TYPE". The main content area displays five rows of test results, each containing a test ID, date, time, and type. The results are as follows:

#	DATE	TYPE
2231	01 Jul 2021 1:00 PM	Antigen
2232	02 Jul 2021 1:00 PM	PCR
2233	03 Jul 2021 1:00 PM	PCR
2234	04 Jul 2021 1:00 PM	PCR
2235	05 Jul 2021 1:00 PM	Antigen

At the bottom, there is a navigation bar with a left arrow, page numbers 1 through 7, and a right arrow.

Figure 46: Test Results (Patient) Mobile UI Mockup

- [UI and User Flow Mockup - Test Results \(Doctor/Health Official\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Test Results \(Doctor/Health Official\) / Mobile](#)
- [► Prototype - Test Results \(Doctor/Health Official\) / Desktop & Tablet](#)
- [► Prototype - Test Results \(Doctor/Health official\) / Mobile](#)

The screenshot displays the covidtracker application interface, specifically the 'Patient List' section for a patient named Myra Foster.

**Left Sidebar (Desktop View):**

- Logo: covidtracker
- Navigation items:
  - Dashboard
  - User
  - Patient (selected)
  - Patient List (highlighted in blue)
  - Define Status Report
  - Status Report Inbox

**Top Right (Desktop View):**

John Doe  
Doctor

**Page Title:** Myra Foster's Test Results

**Breadcrumbs:** Patient > Patient List > Test Results

**Table Headers:**

Show	10	Search	Search		
#	DATE	TYPE	RESULT	ADDRESS	ACTIONS

**Table Data:**

2231	01 Jul 2021 1:00 PM	Antigen	Positive	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2232	02 Jul 2021 1:00 PM	PCR	Positive	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2233	03 Jul 2021 1:00 PM	PCR	Negative	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2234	04 Jul 2021 1:00 PM	PCR	Negative	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2235	05 Jul 2021 1:00 PM	Antigen	Negative	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2236	06 Jul 2021 1:00 PM	Antigen	Negative	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)
2237	07 Jul 2021 1:00 PM	PCR	Negative	1 Waverly Street Montreal, QC A1A 1A1 Canada	(eye icon)

**Page Bottom:**

Showing 40 to 50 of 100 entries

Navigation: < 1 2 3 4 5 6 7 >

Figure 47: Test Results (Doctor/Health Official) Desktop & Tablet UI Mockup

#	DATE	TYPE
2231	01 Jul 2021 1:00 PM	Antigen
2232	02 Jul 2021 1:00 PM	PCR
2233	03 Jul 2021 1:00 PM	PCR
2234	04 Jul 2021 1:00 PM	PCR
2235	05 Jul 2021 1:00 PM	Antigen

Figure 48: Test Results (Doctor/Health Official) Desktop & Tablet UI Mockup

### 7.3.15 Test Result Details

*COV-122 - As a Patient, I want to be able to generate a QR code for a lab test result, so that I can share it with others*

*COV-124 - As a Patient, I want to view the details of a single COVID test result, so that I'm aware of my diagnosis*

A patient is able to view a full detailed description of a given test result and its associated QR code that can be used to easily share such information with either their doctor or a health official. Likewise, upon scanning such QR code, a doctor or health official will be redirected to a similar page. The UI is only accessible by the Patient, Doctor, and Health Official personas. The only UI element that adjusts based on the persona is the breadcrumb text. A selection of UI mockups for desktop, tablet, and mobile can be seen in Figures 49 and 50 for the Patient person and Figures 51 and 52 for the Doctor and Health Official personas. All UI mockups, user flows and associated interactive prototypes for desktop, tablet and mobile platforms are accessible at the following links:

- [UI and User Flow Mockup - Test Result Details \(Patient\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Test Result Details \(Patient\) / Mobile](#)
- [► Prototype - Test Result Details \(Patient\) / Desktop & Tablet](#)
- [► Prototype - Test Result Details \(Patient\) / Mobile](#)

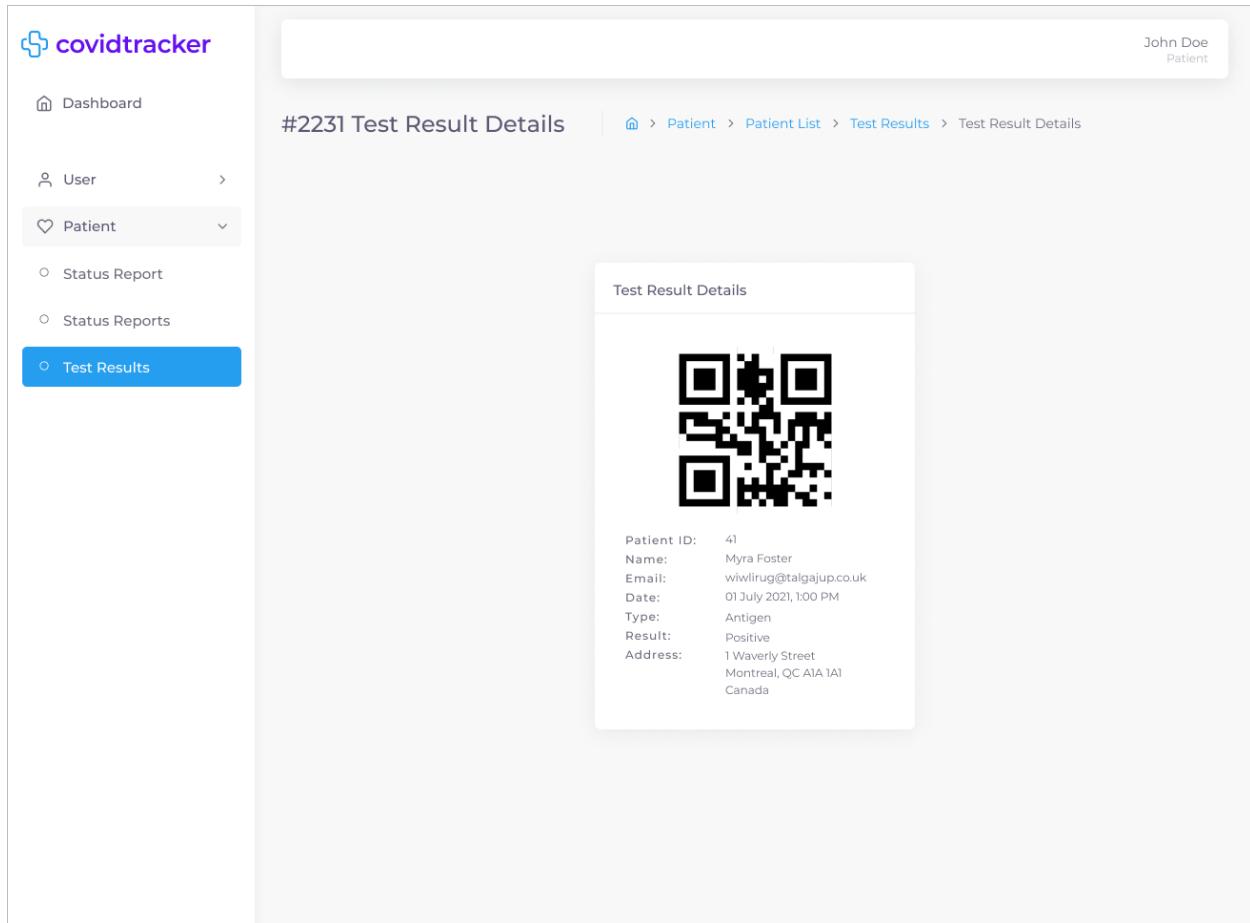


Figure 49: Test Result Details (Patient) Desktop & Tablet UI Mockup

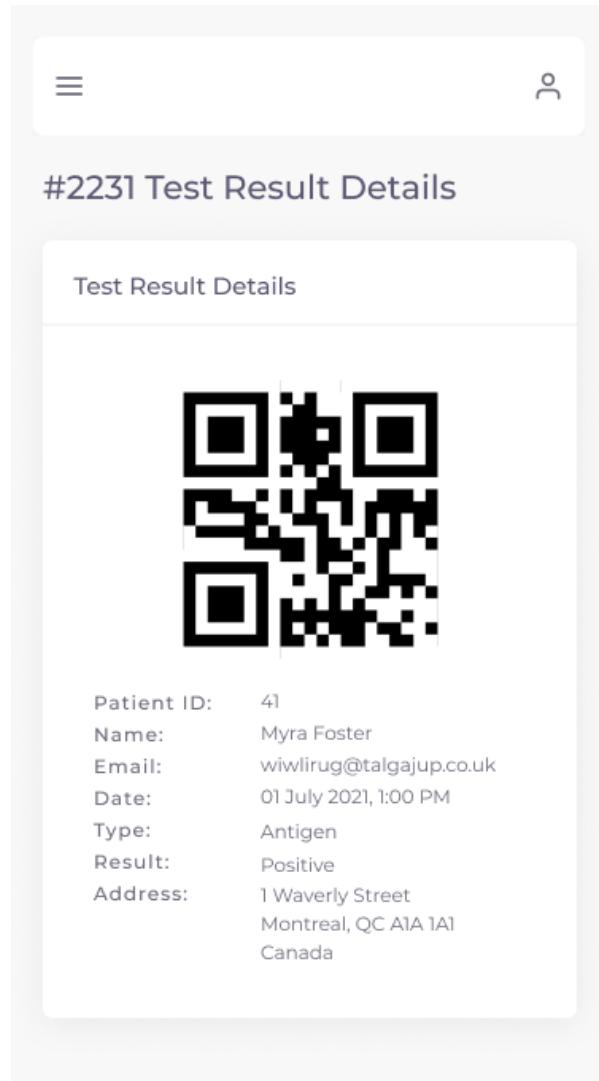


Figure 50: Test Result Details (Patient) Mobile UI Mockup

- [UI and User Flow Mockup - Test Result Details \(Doctor/Health Official\) / Desktop & Tablet](#)
- [UI and User Flow Mockup - Test Result Details \(Doctor/Health Official\) / Mobile](#)
- ► [Prototype - Test Result Details \(Doctor/Health Official\) / Desktop & Tablet](#)
- ► [Prototype - Test Result Details \(Doctor/Health Official\) / Mobile](#)

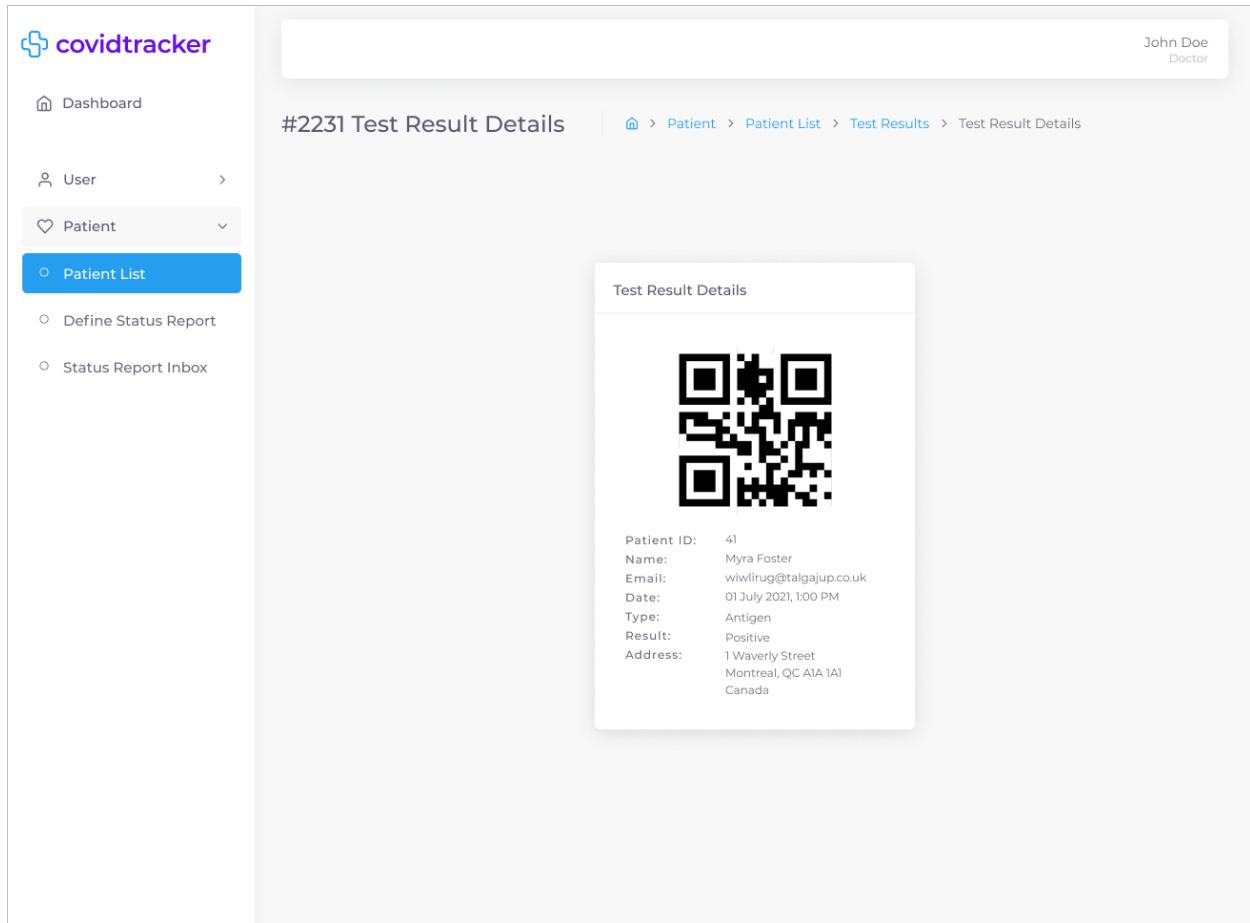


Figure 51: Test Result Details (Doctor/Health Official) Desktop & Tablet UI Mockup

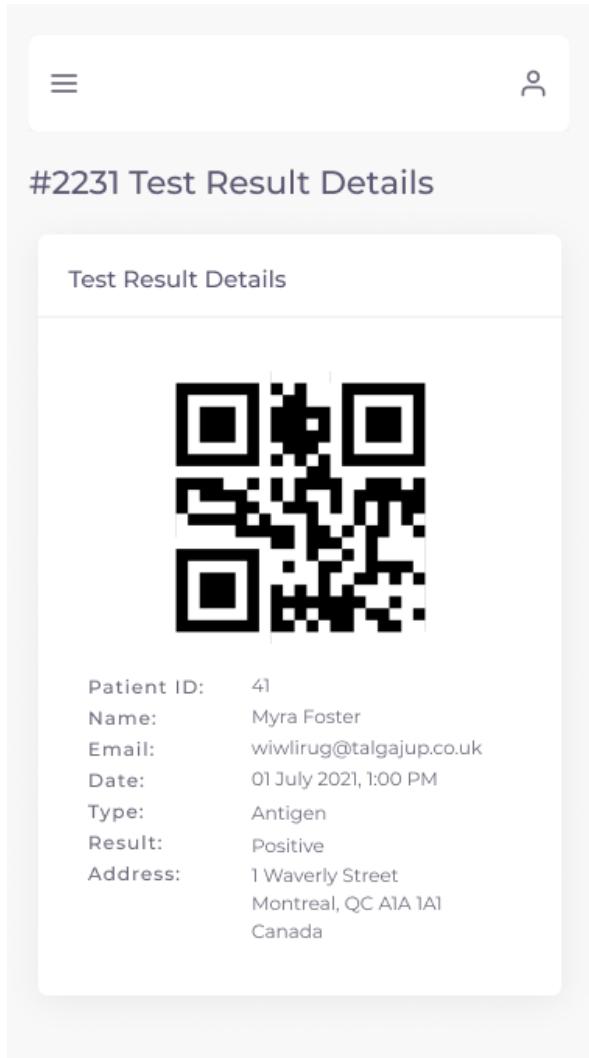


Figure 52: Test Result Details (Doctor/Health Official) Mobile UI Mockup

## 8.0 TESTING PLAN AND REPORT

### 8.1 Unit Tests

#### 8.1.1 Client

Unit tests for the client are automated tests that are run through the CI/CD pipeline on every pull request and commit on the main branch. These tests can be run using the command `npm run test`. We will also be using snapshot testing which will render our front end javascript into HTML and save it in a file. We can then compare it later to make sure no unintended changes were made to the rendered HTML.

All unit tests, including snapshot tests, for the front end will be using the Jest testing framework. We chose this framework because it has the best support for snapshot testing which is the primary way we will be unit testing front end components.

#### 8.1.2 Server

Unit tests for the server are automated tests that are run through the CI/CD pipeline on every pull request and commit on the main branch. These tests can be run using the command `npm run test:unit`.

All unit tests for the server will be using the mocha testing framework and the sinon library to generate spies, mocks, fakes, and stubs. We chose mocha because it has the best support for TypeScript testing suites and integrates well with chai - our assertion library - and sinon which allows us to creates spies, mocks, fakes, and stubs extremely easy so there is little to no boilerplate required when writing unit tests.

A generated unit test report of the system is depicted in the following figure.

## authentication\_controller.ts

/tests/unit/controllers/authentication\_controller.ts



### AuthenticationController::signUp

/tests/unit/controllers/authentication\_controller.ts

⌚ 11ms 📂 7 ✅ 7

✓ should return jwt token when sign up is successful	6ms ⌚
✓ should return status 500 if service throws an error	1ms ⌚
✓ should return status 400 when phone number is incorrect length	1ms ⌚
✓ should return status 400 when gender is not in enum	2ms ⌚
✓ should return status 400 when email is missing	0ms ⌚
✓ should return status 400 when password is missing	0ms ⌚
✓ should return status 400 when password does not follow correct format	1ms ⌚



### AuthenticationController::signIn

/tests/unit/controllers/authentication\_controller.ts

⌚ 1ms 📂 4 ✅ 4

✓ should return jwt token when authentication is successful	0ms ⌚
✓ should return status 500 if service throws an error	0ms ⌚
✓ should return status 400 when email is missing	0ms ⌚
✓ should return status 400 when password is missing	1ms ⌚



## base\_controller.ts

/tests/unit/controllers/base\_controller.ts



## BaseController::index

^

/tests/unit/controllers/base\_controller.ts

⌚ 1ms ⏱ 1 ✓ 1

- ✓ should call res.json with 200 status ok

1ms ⌚

## doctor\_controller.ts

^

/tests/unit/controllers/doctor\_controller.ts

### DoctorController::setStatusFields

^

/tests/unit/controllers/doctor\_controller.ts

⌚ 1ms ⏱ 2 ✓ 2

- ✓ should return status 200 with correct patient counts

0ms ⌚

- ✓ should return status 500 if service throws an error

1ms ⌚

## patient\_controller.ts

^

/tests/unit/controllers/patient\_controller.ts

### PatientController::assignDoctor

^

/tests/unit/controllers/patient\_controller.ts

⌚ 1ms ⏱ 4 ✓ 4

- ✓ should assign doctorId to the given patient

0ms ⌚

- ✓ should return status 400 if doctorId is not passed

0ms ⌚

- ✓ should return status 400 if patientId is not passed

1ms ⌚

- ✓ should return status 500 if service throws an error

0ms ⌚

## PatientController::setStatusFields

/tests/unit/controllers/patient\_controller.ts

⌚ 3ms ⏱ 5 ✓ 5

✓ should return status 201 when no errors	1ms ⌚
✓ should return status 400 when no patient id	0ms ⌚
✓ should return status 400 when no fields	1ms ⌚
✓ should return status 400 when a field has a non boolean type	1ms ⌚
✓ should return status 500 if service throws an error	0ms ⌚

## PatientController::getPatientStatusFields

/tests/unit/controllers/patient\_controller.ts

⌚ 0ms ⏱ 4 ✓ 4

✓ return status 201 when no errors	0ms ⌚
✓ return status 400 when patientId is not passed	0ms ⌚
✓ return status 400 when invalid patientId is passed	0ms ⌚
✓ return status 500 when service throws an error	0ms ⌚

## PatientController::submitStatus

/tests/unit/controllers/patient\_controller.ts

⌚ 2ms ⏱ 4 ✓ 4

✓ should return status 201 when no errors	1ms ⌚
✓ should return status 400 when no patient id	0ms ⌚
✓ should return status 400 when no status	0ms ⌚
✓ should return status 500 if service throws an error	1ms ⌚

## user\_controller.ts

/tests/unit/controllers/user\_controller.ts



### UserController::me

/tests/unit/controllers/user\_controller.ts

⌚ 0ms ⏱ 2 ✓ 2

- ✓ should return user when user is found by id 0ms ⓘ
- ✓ should return status 500 if service throws an error 0ms ⓘ



### UserController::assignRole

/tests/unit/controllers/user\_controller.ts

⌚ 1ms ⏱ 5 ✓ 5

- ✓ should return status 204 if no errors 0ms ⓘ
- ✓ should return status 400 if userId is not a number 0ms ⓘ
- ✓ should return status 400 if role is not valid 1ms ⓘ
- ✓ should return status 400 if role is not passed 0ms ⓘ
- ✓ should return status 500 if service throws an error 0ms ⓘ



## 8.2 Integration Tests

### 8.2.1 Client

Integration tests for the client are automated tests that are run through the CI/CD pipeline on every pull request and commit on the main branch. These tests can be run using the command `npm run test`. All integration tests for the front end will be using the Jest testing framework. We chose Jest for the same reasons mentioned in the above section.

These tests use a mock API that returns mock server responses to test the integration between all the client side code and the server API.

### 8.2.2 Server

Integration tests for the server are automated tests that are run through the CI/CD pipeline on every pull request and commit on the main branch. These tests can be run using the command `npm run test:integration`.

All integration tests for the server will be using the mocha testing framework and supertest in order to create a callable instance of our web server. We chose to use supertest because it provides the easiest integration with our web framework library.

These tests use a database to test the integration between all the server side code and the database implementation.

## 8.3 Acceptance Tests

Acceptance tests will be documented and run manually to show an entire flow of the application. These tests will use the client to interface with the server which will persist the data in the database. All these tests will be based on the user stories to ensure that all user flows work as specified by the requirements.

These tests can be automated using a tool like Selenium in order to mock a real user interacting with the full system. The acceptance tests are also written in Gherkin Syntax which is a behavioral driven development syntax that allows us to define our tests in terms of user state and behavior.

Below are the current acceptance tests for the system.

<b>AT-1</b>	<b>COV-42 - As a User, I was to be able to sign up, so that I can access the apps features</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the sign up page AND that I input all required fields AND that I clicked the Sign Up button THEN my account should be created AND I should be logged in AND I should be redirected to the main screen.
<b>Result</b>	<b>PASS</b>

Table 7: Acceptance Test for COV-42

<b>AT-2</b>	<b>COV-48 - As a User, I want to be able to sign in, so that I can access my account</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the sign in page AND that I input my valid email AND that I input my valid password AND that I clicked the Sign In button THEN I should be logged into the site AND my session should persist AND I should be redirected to the main screen.
<b>Result</b>	<b>PASS</b>

Table 8: Acceptance Test for COV-48

<b>AT-3</b>	<b>COV-52 -As a User, I want to be able to sign out so, that I can delete my session</b>
<b>Acceptance Criteria</b>	GIVEN that I am on a page with a navbar AND that I am signed in AND that I clicked the Sign Out button THEN I should be logged out of the site AND my session should be deleted AND I should be redirected to the sign in page.

<b>Result</b>	<b>PASS</b>
---------------	-------------

Table 9: Acceptance Test for COV-52

<b>AT-4</b>	<b>COV-85 - As an Administrator, I want to assign a role to a User, so that I can manage access rights</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the assign role page AND that I am signed in as an admin AND I inputted a valid user id that has no current role AND I selected a role from the dropdown AND I click the “Add a Role” button THEN the role should be assigned to the user AND I should receive a confirmation of my action.
<b>Result</b>	<b>PASS</b>

Table 10: Acceptance Test for COV-85

<b>AT-5</b>	<b>COV-26 - As an Administrator, I want to assign a Patient to a Doctor, so that I can manage the Patients</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the assign doctor page AND that I am signed in as an admin AND I inputted a valid patient id that has no doctor assigned AND I inputted a valid doctordid AND I click the “Assign a Patient” button THEN the patient should be assigned to the doctor AND I should receive a confirmation of my action.
<b>Result</b>	<b>PASS</b>

Table 11: Acceptance Test for COV-26

<b>AT-6</b>	<b>COV-95 - As a Doctor, I want to define the status report fields for my Patients, so I can properly track them</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the define status report fields page AND that I am signed in as a doctor AND I inputted a valid patient id that is assigned to the doctor AND I selected the fields to assign AND I click the “Define Status Report” button THEN the patient should be assigned the status report fields

	AND I should receive a confirmation of my action.
<b>Result</b>	<b>PASS</b>

Table 12: Acceptance Test for COV-95

<b>AT-7</b>	<b>COV-25 - As a Patient, I want to submit my status, so that I can keep my Doctor updated</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the submit status page AND that I am signed in as a patient AND I inputted the required fields AND I click the “Submit” button THEN the my status report should be submitted AND I should receive a confirmation of my action.
<b>Result</b>	<b>PASS</b>

Table 13: Acceptance Test for COV-25

<b>AT-8</b>	<b>COV-27 - As an Administrator, I want to view the number of Patients assigned to a Doctor, so that no Doctor has too many Patients</b>
<b>Acceptance Criteria</b>	GIVEN that I am on the view patients count page AND that I am signed in as an admin THEN I should be able to view the patient count per doctor AND the total number of assigned patients AND the average number of patients per doctor.
<b>Result</b>	<b>PASS</b>

Table 14: Acceptance Test for COV-27

#### 8.4 System Tests

System tests will be documented and run manually to show an entire flow of the application. These tests will use the client to interface with the server which will persist the data in the database. All these tests will be based on the user stories to ensure that all user flows work as specified by the requirements

These tests can be automated using a tool like Selenium in order to mock a real user interacting with the full system.

Below are the current system tests for the system.

<b>ST-1</b>	<b>COV-42 - As a User, I was to be able to sign up, so that I can access the apps features</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>
<ol style="list-style-type: none"> <li>1. Navigate to the sign up page (relative url "/sign_up")</li> <li>2. Fill all required fields with valid inputs</li> <li>3. Click the Sign Up Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the sign up page</li> <li>2. The form should not give any input errors</li> <li>3. The form should not give any input errors, your account should be created, you should be signed in, and you should be redirected to the main screen</li> </ol>

Table 15: System Test for COV-42

<b>ST-2</b>	<b>COV-48 - As a User I want to be able to sign in, so that I can access my account</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>
<ol style="list-style-type: none"> <li>1. Navigate to the sign in page (relative url "/sign_in")</li> <li>2. Input your email and password</li> <li>3. Click the Sign In Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the sign in page</li> <li>2. The form should not give any input errors</li> <li>3. The form should not give any input errors, you should be signed in, and you should be redirected to the main screen</li> </ol>

Table 16: System Test for COV-48

<b>ST-3</b>	<b>COV-52 - As a User I want to be able to sign out, so that I can delete my session</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>

<ol style="list-style-type: none"> <li>1. Navigate to a page where the navbar can be seen</li> <li>2. Click the Sign Out Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the sign out button in the navbar</li> <li>2. You should be signed out, your session should be deleted, and you should be redirected to the Sign In page</li> </ol>
--	--

Table 17: System Test for COV-52

<b>ST-4</b>	<b>COV-85 - As an Administrator, I want to assign a role to a User, so that I can manage access rights</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>

<ol style="list-style-type: none"> <li>1. Navigate to the assign role page (relative url "/assign_role")</li> <li>2. Input the user id and select a role</li> <li>3. Click the "Add a Role" Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the assign role form</li> <li>2. The form should not give any input errors</li> <li>3. The form should not give any input errors, the user should be assigned the role, and the page should display a confirmation message for your action</li> </ol>
---	--

Table 18: System Test for COV-85

<b>ST-5</b>	<b>COV-26 - As an Administrator, I want to assign a Patient to a Doctor, so that I can manage the Patients</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>

<ol style="list-style-type: none"> <li>1. Navigate to the assign doctor page (relative url "/assign_doctor")</li> <li>2. Input the patient id and the doctor id</li> <li>3. Click the "Assign a Patient" Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the assign doctor form</li> <li>2. The form should not give any input errors</li> <li>3. The form should not give any input errors, the patient should be assigned the doctor, and the page should display a confirmation message for your action</li> </ol>
--	---

Table 19: System Test for COV-26

<b>ST-6</b>	<b>COV-95 - As a Doctor, I want to define the status report fields for my Patients, so I can properly track them</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>

<ol style="list-style-type: none"> <li>1. Navigate to the define status report page (relative url "/define_status_report")</li> <li>2. Input the patient id</li> <li>3. Select the checkboxes for each status field you wish the patient to input</li> <li>4. Click the "Define Status Report" Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the define status report form</li> <li>2. The form should not give any input errors</li> <li>3. The form should not give any input errors</li> <li>4. The patient should be assigned the status fields and the page should display a confirmation message for your action</li> </ol>
--	---

Table 20: System Test for COV-95

<b>ST-7</b>	<b>COV-25 - As a Patient, I want to submit my status, so that I can keep my Doctor updated</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>
<ol style="list-style-type: none"> <li>1. Navigate to the status report page (relative url "/status_report")</li> <li>2. Input the required fields based on your symptoms</li> <li>3. Click the "Submit" Button</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the status report form</li> <li>2. The form should not give any input errors</li> <li>3. The status report should be submitted and the page should display a confirmation message for your action</li> </ol>

Table 21: System Test for COV-25

<b>ST-8</b>	<b>COV-27 - As an Administrator, I want to view the number of Patients assigned to a Doctor, so that no Doctor has too many Patients</b>
<b>Steps to reproduce</b>	<b>Expected output for each step</b>
<ol style="list-style-type: none"> <li>1. Navigate to the patients assigned page (relative url "/patients_assigned")</li> </ol>	<ol style="list-style-type: none"> <li>1. You should see the total number of patients assigned, the average number of patients, and a table view of the number of patients assigned to each doctor</li> </ol>

Table 22: System Test for COV-27

## 8.5 Test Code Coverage

### 8.5.1 Client

A report of the code coverage can be generated by running the command `npm run test --coverage` this will produce a coverage report of the client side code.

### 8.5.2 Server

A report of the code coverage can be generated by running the command `npm run test:coverage` this will produce a coverage report of the server side code.

A code coverage report of the server side code is depicted in the following figure. NYC/Istanbul was used to compute the code coverage. It reports coverage by folder, you can then click into the folder and view the other folders coverage or individual file coverage. Then you can open a specific file to view line by line coverage reports.

#### All files

87.33% Statements 455/521    77.52% Branches 69/89    81.7% Functions 67/82    86.94% Lines 413/475

Press *n* or *j* to go to the next uncovered block, *b*, *p* or *k* for the previous block.

Filter:

File ▲		Statements ▲		Branches ▲		Functions ▲		Lines ▲	
src	<div style="width: 100%; background-color: #2e6b2e;"></div>	100%	60/60	100%	0/0	100%	0/0	100%	60/60
src/controllers	<div style="width: 96.95%; background-color: #2e6b2e;"></div>	96.95%	159/164	95.23%	40/42	100%	20/20	96.71%	147/152
src/entities	<div style="width: 100%; background-color: #2e6b2e;"></div>	100%	12/12	100%	4/4	100%	2/2	100%	12/12
src/entities/errors	<div style="width: 66.66%; background-color: #ffcc00;"></div>	66.66%	4/6	100%	0/0	50%	1/2	66.66%	4/6
src/helpers	<div style="width: 100%; background-color: #2e6b2e;"></div>	100%	3/3	100%	3/3	100%	1/1	100%	2/2
src/repositories	<div style="width: 84.11%; background-color: #2e6b2e;"></div>	84.11%	143/170	83.33%	5/6	80%	32/40	83.56%	122/146
src/services	<div style="width: 69.81%; background-color: #ffcc00;"></div>	69.81%	74/106	50%	17/34	64.7%	11/17	68.04%	66/97

Figure 53: Code Coverage Report of Server Side Code

## **9.0 DEFECT TRACKING AND REPORT**

Sprint 2 had no new bugs and included 2 bug fixes from sprint 1. The team focused on testing each user story better and as a result we were able to catch bugs before merging in and closing the user stories. As we refine the frontend more we might find more bugs. However, through unit and integration testing along with code review we were able to catch all bugs that came up this sprint before a ticket had to be opened.

Type: Bug

Sorted by: Created descending

1–2 of 2 as at: 23/Feb/22 10:05 PM

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description	Status	
	COV-145	The drop down inputs in the sign in form are pre-selected when they should not have a default value	1		Low		Authentication and Authorization	Jason Gerard	Jason Gerard	04/Feb/22	04/Feb/22	Currently the sign in form has some drop down input for selecting the gender and province. These drop downs have pre-selected values so that no validation needs to take place.  This should be fixed so that there is no value as default and be required to have a user input the selection.	<span style="border: 1px solid green; padding: 2px;">DONE</span>

T	Key	Summary	Story point estimate	P	Risk	Parent	Assignee(s)	Creator	Due	Start date	Description	Status
●	COV-144	The navbar shows a placeholder name instead of the logged in users name	1	▼	Low	 Authentication and Authorization	Jason Gerard	Jason Gerard	06/Feb/22	06/Feb/22	Currently when a user logs in the navbar will show a placeholder first and last name. This should show the logged in users first and last name.	<span>DONE</span>

## 10.0 QUALITY MEASUREMENTS

This section depicts and describes the various metrics being used, the cause of the results and how the results can be improved.

### 10.1 Metrics Used

The following metrics are being used:

- **Statement coverage:** Checks to see if each statement in the program has been executed while running the test suite.
- **Branch coverage:** Checks to see if all conditional branches (if statement and ternaries) are covered while running the test suite.
- **Function coverage:** Checks to see if every function in the source code was called at least once while running the test suite.
- **Line coverage:** Checks if each physical line in the source code has been executed at least once while running the test suite. This is mostly covered by statement coverage, which is generally superior because it ignores coding styles better, but we are including it for completeness of all generated metrics.
- **Linting errors:** Errors we receive if we run our automated linting package, ESLint. The types of errors and severity are defined by our .eslintrc file. This includes checks against many things, primarily language standards.
- **Formatting errors:** Errors we receive if we run our automated formatting package, prettier. This package has defined an opinionated formatting standard that can automatically be applied to most code, but some must still be manually formatted to follow the standard.

### 10.2 Cause of Results

There aren't any formatting and linting errors because the CI/CD pipeline will fail if any are detected resulting in them immediately being fixed.

Test coverage has improved greatly since sprint 1 and we focused on covering all edge cases in our unit tests.

### 10.3 Improving the Results

The test coverage can still be improved by the same method we used in sprint 2 going forward which is by simply requiring all pull requests to have full test coverage. Through this process we will incrementally increase test coverage to 90%-100% overtime without having to dedicate a larger block of time. As can be seen by the chart below the coverage has already improved significantly.

	<b>Sprint 1</b>	<b>Sprint 2</b>	<b>Sprint 3</b>	<b>Sprint 4</b>	<b>Sprint 5</b>
Statement Coverage	65.6%	87.33%			
Branch Coverage	55.55%	77.52%			
Function Coverage	41.66%	81.7%			
Line Coverage	64.34%	86.94%			
Linting Errors	0	0			
Formatting Errors	0	0			

Table 23: Test Coverage for Each Sprint

## APPENDIX A: TEAM COLLABORATION AND COMMUNICATION

Stakeholders use a set of tools to collaborate and communicate throughout the project lifecycle.

### A.1 Collaboration

- **Google Suite (Docs, Drive, Sheets):**  
G Suite is a collection of business, productivity, collaboration, and education software developed and powered by Google. The primary G Suite tools include Gmail, Drive, Docs, Sheets, Slides, Forms, Calendar, Google+, Sites, Hangouts, and Keep. [2] Google Suite is used for documentation since it is widely accessible and available to all development team members.
- **GitHub:** GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere. We use github to be able to work on different sections of the code at the same time and have a version control. [3]

### A.2. Communication

- **Discord:** Discord is a free voice, video, and text chat app that's used by tens of millions of people ages 13+ to talk and hang out with their communities and friends. [6] Discord is used for communication and meetings among development team members. Voice and text channels are named according to the different development team groups (i.e. back end, front end and UI design).
- **Slack:** Slack is a messaging app for business that connects people to the information they need. By bringing people together to work as one unified team, Slack transforms the way organizations communicate. [5] Slack is used to communicate with the product owners when clarification is needed or to schedule meetings.

- **Zoom:** Zoom is a cloud-based video conferencing platform that can be used for video conferencing meetings, audio conferencing, webinars, meeting recordings, and live chat. [1] Zoom is used for meetings with the product owners.

### A.3 Tools

- **Issue and project tracking tool:** Jira

<https://www.atlassian.com/software/jira>.

Jira is a software application used for issue tracking and project management. The tool has become widely used by agile development teams to track bugs, stories, epics, and other tasks. [4]

- **Diagram modeling tool:** Draw.io

<https://app.diagrams.net/>

Draw.io is an online diagram editor that enables you to create flowcharts, UML, entity relation, network diagrams, mockups and more.

- **User interface design and prototyping tool:** Figma

<https://www.figma.com/>

Figma is a UI and UX design application, with excellent design, prototyping, and code-generation tools. It's arguably the industry's leading interface design tool, with robust features which support teams working on every phase of the design process.

## APPENDIX B: GLOSSARY

- **Application Programming Interface (API):** An application programming interface (API) is a computing interface which defines interactions between multiple software intermediaries. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc. [7]
- **Logical Layered Architecture:** Layered architecture is an architecture pattern that promotes high cohesion and low coupling through separation of concerns by layers. Each layer depends on the layer below it.
- **UML Domain Model:** A conceptual view of the domain represented through UML classes and relationships. [8]
- **Risk Management:** Practice of identifying, evaluating, and preventing or mitigating risks to a project that have the potential to impact the desired outcomes.
- **Database:** Databases store aggregations of data records or files that contain information, such as sales transactions, customer data, financials and product information. [9]
- **UI prototype:** User interface prototyping is an iterative analysis technique in which users are actively involved in the mocking-up of the UI for a system. [10]
- **UI/UX mockup :** A mockup is a static wireframe that includes more stylistic and visual UI details to present a realistic model of what the final page or application will look like. [11]
- **CI/CD pipeline:** Series of steps that must be performed in order to deliver a new version of software. Continuous integration/continuous delivery (CI/CD) pipelines are a practice focused on improving software delivery using either a DevOps or site reliability engineering (SRE) approach. [12]

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