

### Santé publique Ontario

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Please scroll down this file to view a copy of the slides from the session.



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### **Declaration of COI**

Kumanan Wilson is a co-founder and CEO of CANImmunize.

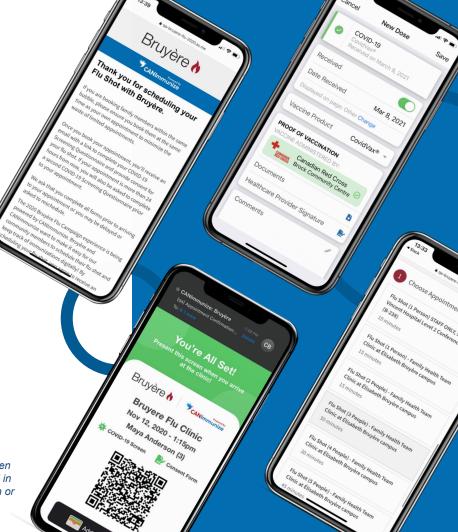
Katherine Atkinson is a co-founder and COO of CANImmunize.





For Mass COVID-19 Immunization Programs

The Nova Scotia Experience



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# Objectives

- Introduce CANImmunize and background developing digital solutions
- Explain why digital solutions are needed to support immunization programs
- Summarize the components of digital immunization solutions
- Discuss the limitations with digital immunization solutions
- Identify potential future opportunities with digital immunization solutions



CANImmunize is a national immunization app available for free on iOS and Android devices, and on the web.

It helps families across Canada manage their vaccination records, and sends reminders when it's time to vaccinate.

CANImmunize has been downloaded by over 230,000 Canadians and won the Canadian Wireless Telecommunications Association's Connected to the Community Award.



# The World's First Digital Immunization Record - A recognized solution



- Led by experts in immunization, public health and digital health, with 10 years of experience developing digital health and immunization solutions.
- Funded by the Public Health Agency of Canada
- Recognized by the European Centre for Disease Prevention and Control and Deloitte Global as a model for consumer facing immunization solutions.
- Certified by the WHO VaccineSafetyNet.
- Awarded the Canadian Wireless and Telecommunication Associations Connected with the Community Award.
- Identified as a leading achievement of the Federal Health Minister in 2014.
- Leading practice of the Health Standards Organization.

Ongoing collaboration with FPT partners to digitally prepare for a COVID vaccine

## Our Partnerships









Public Health

Agency of Canada

Financial Contribution from



Agence de la santé

publique du Canada

### **Our Partners**

























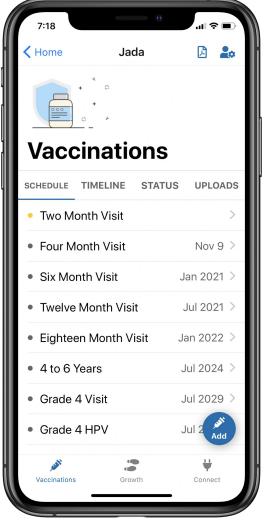












The rollout of a COVID-19 vaccine will be the most complex mass health intervention in history.



# Logistically, there are many challenges

- Vaccination tracking: will be required at the individual level to understand population coverage and prevent COVID-19 outbreaks.
- Rapidly detecting and monitoring adverse events: vaccine development is taking place at an unprecedented speed, and surveillance infrastructure will be required to respond to adverse events and potential recalls.
- Distinguishing vaccines: multiple vaccine products will be on the market, each with a unique safety and effectiveness profile.
- Ensuring series completion: some products will require a minimum of 2 doses to confer immunity and may require annual inoculation like the seasonal influenza vaccine.
- Understanding eligibility: requirements will change over time as the vaccine is rolled-out in stages and will need to be communicated to the public.

# The digital immunization system of the future: imagining a patient-centric, interoperable immunization information system

Katherine M. Atkinson, Salima Saleem Mithani, Cameron Bell, Taylor Rubens-Augustson, Kumanan Wilson

First Published October 28, 2020 | Review Article | **(A)** https://doi.org/10.1177/2515135520967203

Article information ~

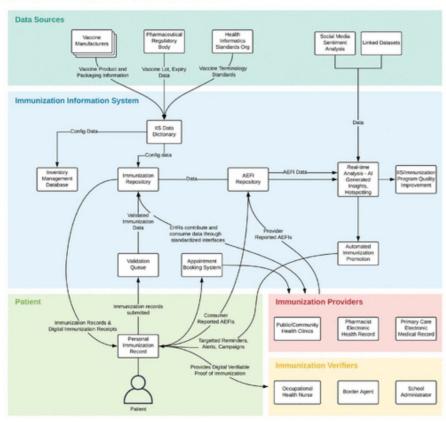


Figure 1. Data sources and components of a modern immunization information system.

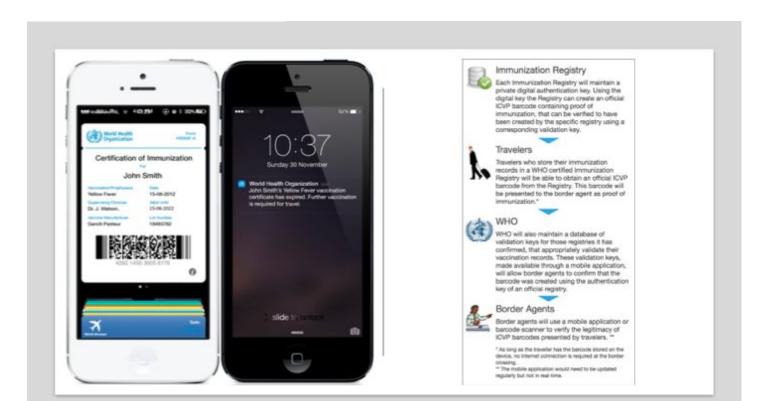
> Am J Trop Med Hyg. 2016 Mar;94(3):485-488. doi: 10.4269/ajtmh.15-0510. Epub 2015 Dec 28.

# Travel Vaccines Enter the Digital Age: Creating a Virtual Immunization Record

Kumanan Wilson, Katherine M Atkinson, Cameron P Bell

PMID: 26711516 PMCID: PMC4775877 DOI: 10.4269/ajtmh.15-0510

Free PMC article





### Immunization clinics are logistically complicated

 Coordinating clinician schedules, collecting patient informed consent, and issuing vaccination cards is complex

### Challenges are layered with the new reality of COVID-19

 With social distancing requirements, COVID-19 screening, appointment booking and minimizing contact and touch is more important than ever

# Paper-based documentation is time consuming and prone to error

 Manual entry of vaccine details (e.g. product, lot number, expiry) are essential for record keeping and surveillance, but in the current state, inefficient

# The Solution

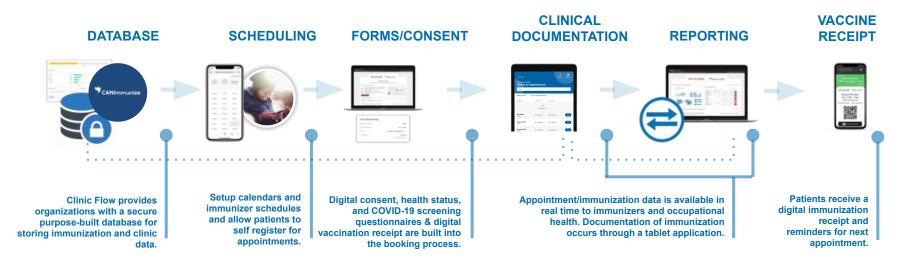
CANImmunize Clinic Flow gives organizations the digital tools they need to efficiently run immunization clinics and campaigns.

- Online appointment booking
- Patient COVID-19 screening
- Capturing consent for immunization digitally
- Clinical documentation of a vaccination according to federal/provincial standards
- Secure Repository

- APIs for integration with existing systems
- Data reporting and analytics
- Easy, user friendly UI
- Leverage the existing CANImmunize mobile app to collect immunization data from your employees. Coming soon!

### COVID-19 Workflow on Clinic Flow Platform

Clinic Flow is an end-to-end solution for management of your COVID-19 immunization program.



Clinic Flow is seamless for patients and ensures providers are up to date and in control of their immunization campaigns with real-time reporting and tracking.





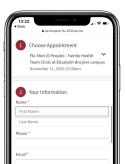
### **Admin Console**

- Configure clinic calendars, intake forms
- Authorize immunizer accounts
- Access reports and analytics



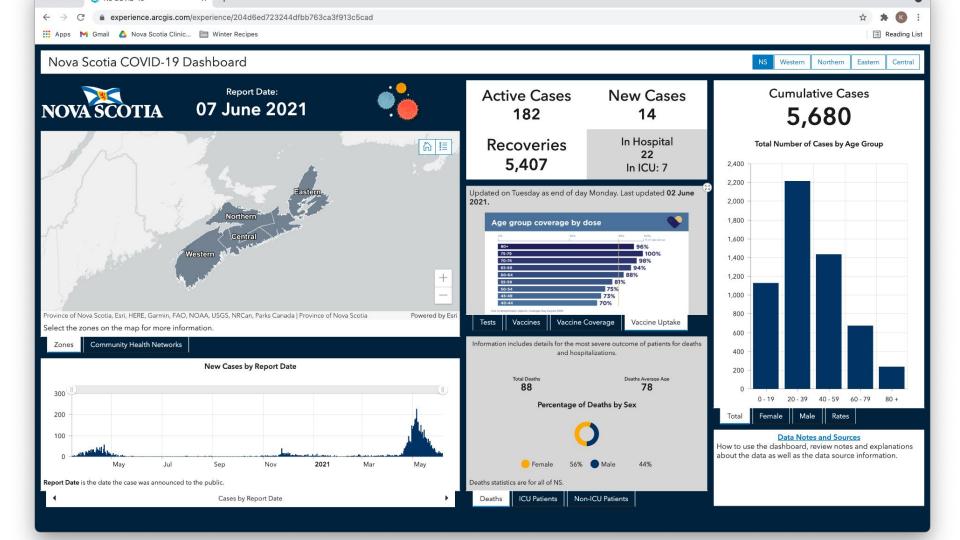
### **Clinic Mode**

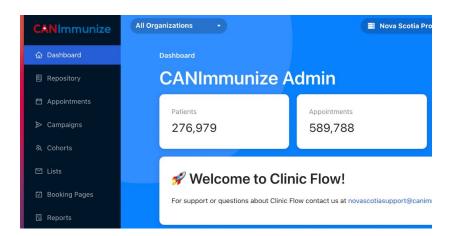
- Mobile application (iOS and Android)
- View appointments, patient form status
- Preload product information
- Organize patients into cohorts
- Document patient immunization



### **Patient Experience**

- Book appointment, complete intake forms
- Receive immunization receipt and reminders for your next dose
- Compatible with CANImmunize





### Admin Console - 1643 users

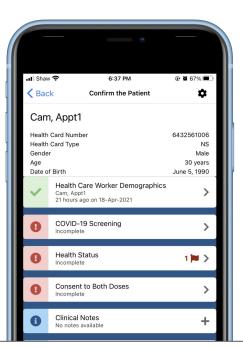
NS Super Admins: 63

CANI Admins: 15

Clinic Admins: 1252

Call Centre Agents: 313

### **CANImmunize**



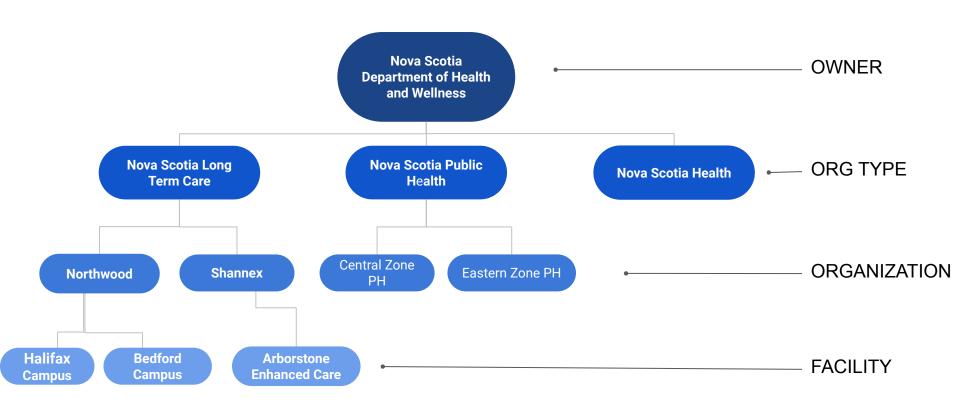
### **Clinic Mode**

3,228 Immunizer Accounts 1,910 Greeter Accounts

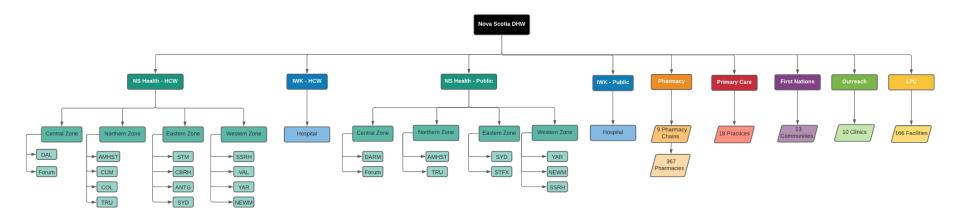
### **Immunizations Given**

637,911 +

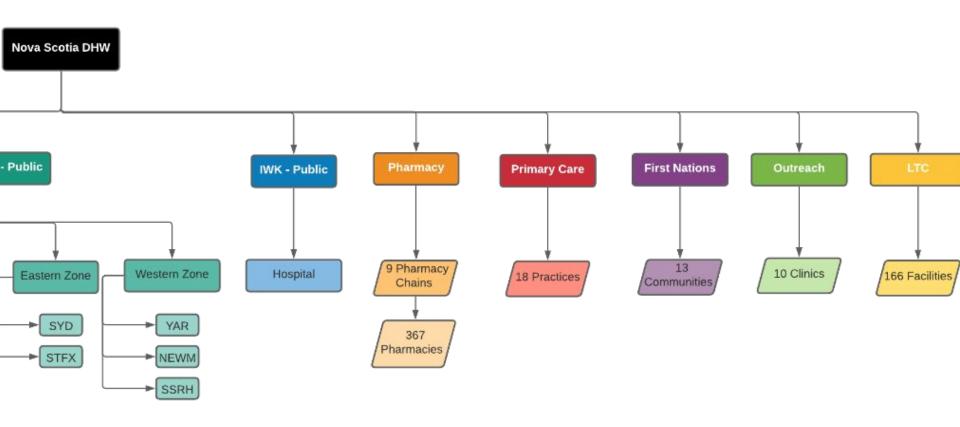
# Relationship between Owner, Org, Organization and Facility



# **Organizational Structure**







# **Project Progress**

**January, 2021** - Clinic Flow environment set-up and configuration, live training sessions of first immunizers, greeters and admins, and launched LTC clinics (Moderna)

**February, 2021** - Launched health care worker clinics (Pfizer), public clinics for adults aged 80+ (Pfizer/Moderna); launched CANI support program.

March, 2021 - Launched First Nation community clinics (Pfizer) and pharmacy/primary care clinics (AstraZeneca) for adults aged 55-64.

**April, 2021** - Expanded public clinics (n=200+) with age limit lowered to adults aged 60+ and launched Outreach clinics.

May, 2021 - Launch of drive through clinics (multi-person appointments), enhancements

# **Project Progress**

**April, 2021** - Expanded public clinics (n=200+) with age limit lowered to adults aged 60+ and launched outreach clinics.

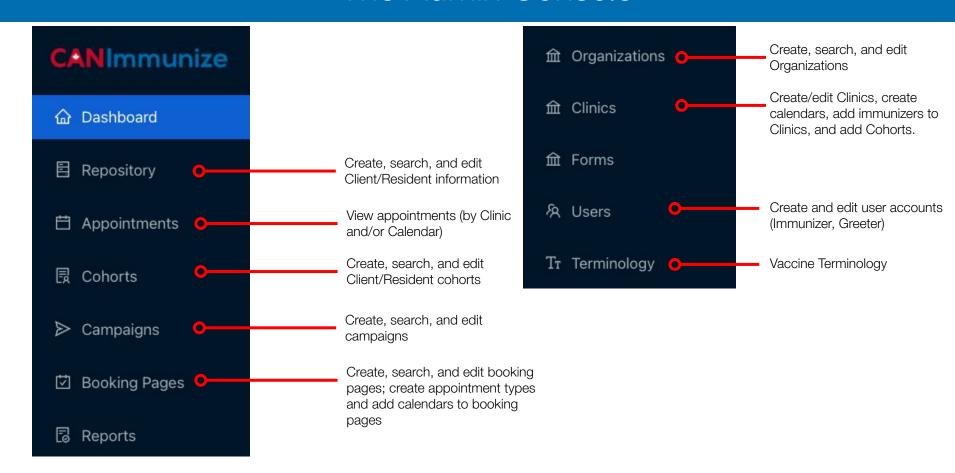
- **April 3:** Improved calendar configuration, including bulk creation; ability to stage calendars on booking pages; single-use invitation links for cohorts; customized statistics to display Public vs Internal calendars; custom reports (new: forward facing booking report, pharmacy booking report)
- **April 13:** Address lookup on booking pages, and 'Fully Booked' indication; ability to edit immunizations within Console; support no-roster (LTC Cohort) immunization uploads; updates to Health Status Form (to support non-healthcare priority populations).
- **April 26:** Created 'Clinic Admin' and 'Call Centre' roles; ability to reschedule dose 1 or 2 across appointment types (using appropriate restrictions [e.g. dose interval, product, and form updates]), outside and within console; ability to edit non-matching demographics and demographics for patients with Client Registry override; ability to change patient managing organization.
- April 29: Updated Health Status Form to have two, product-specific forms; pre-population of form fields between the same form type supported in Clinic Mode

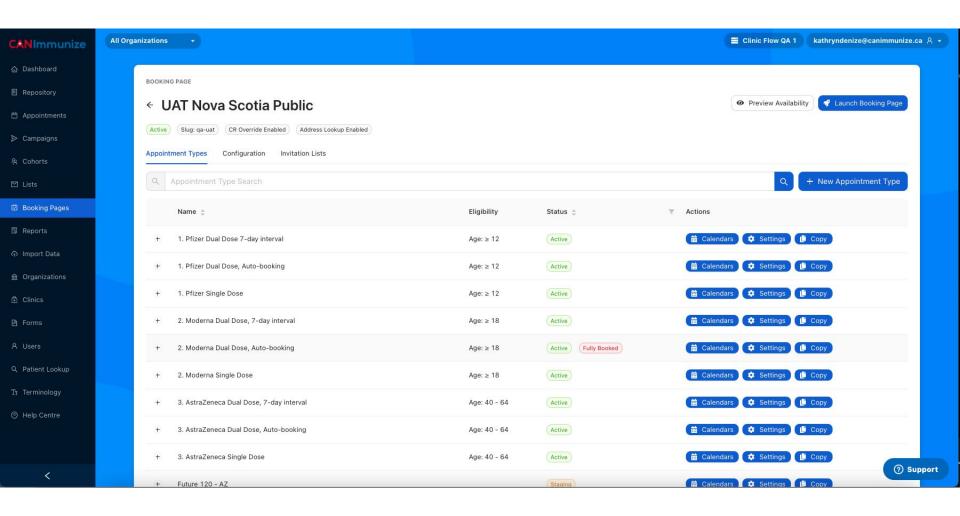
# **Project Progress**

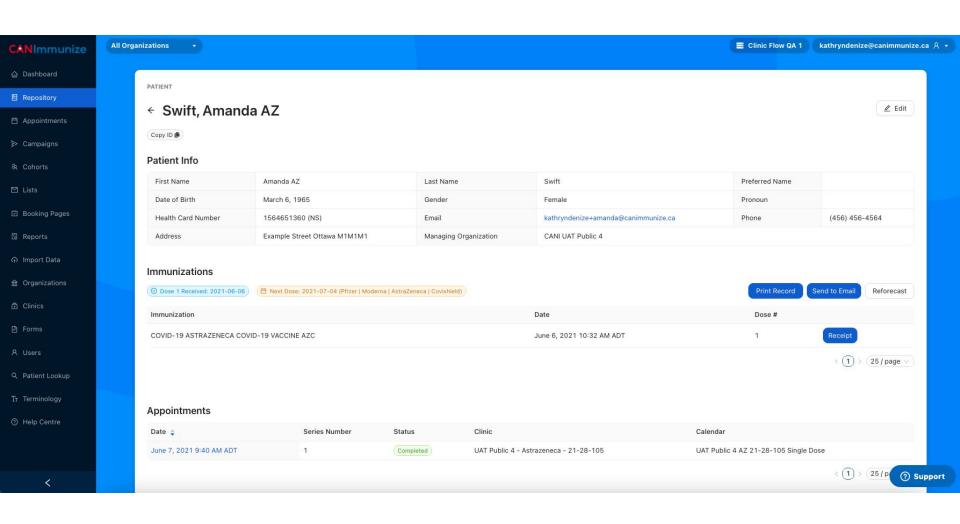
May, 2021 - Over 40% of NS population received first dose, drive thru appointments supported (1 person/car), age limit lowered to 30+ (anticipated to be 12+ by end of May), paused administration of AstraZeneca and rescheduled individuals to mRNA appointments

- May 6: Patient look-up, including new role "HC-Provider"; appointment booking within console, including ability to book alternate, single-dose series if authorized user (required new role of "special-call-center-agent"; addition of waitlist option (MVP); custom reports (new: clinic configuration, clinic summary report, Client Registry override report; updates: booking detail, forward-facing report)
- May 11: Clinic Mode update to enable Users to select any date for Clinic Roster; supports retrospective documentation of immunizations in Clinic Mode.
- May 19: Create patient within Console (required new role of "clinic-owner"); creation of nightly job and additional email to support dose 2 booking for clients who were not autobooked; Admin Console roles improved such that roles are defined on both server & client.

### The Admin Console







■ Repository

久 Cohorts

☑ Lists

D Booking Pages

Reports

☆ Organizations

Clinics

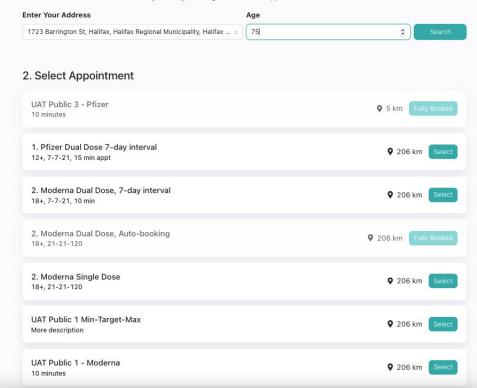
Forms

A Users

← Paulo Pfizer Swift			∠ Edit
Appointment Details			
☐ Cancel Appointment	Reschedule	Dpen Appointment Summary	→ Next Appointment
First Name			Pfizer
Last Name		Swift	
Phone Number		(456)	156-4566
Email		kathry	ndenize+paulo@canimmunize.ca
Patients		Swift,	Paulo Pfizer
Appointment Date/Time		June 6	, 2021 12:30 PM ADT (15 mins)
Clinic		UAT P	izer 7-7-21
Calendar		UAT P	izer 7-7-21 Dual Dose
Rule		b6d4e	da2-95a1-49c6-9f6a-4772350b76e4
Location		UATHA	W1
Appointment Series		1	
Consent Form Complete		Yes	
COVID-19 Initial Screening Complete		Yes	
COVID-19 24Hr Screening Complete		No	
Appointment Status			eted
Created at		June 6	, 2021 11:48 AM ADT

#### 1. Find a Clinic

Start by entering an address (for example, 1723 Hollis St, Halifax) and then select the address from the options. Next, enter your age and click search to see clinics close to you that you're eligible to book an appointment for.







# TEST PAGE: Book a COVID-19 vaccination appointment at the Test Clinic

You can use this service to book a COVID-19 vaccination appointment.



#### Before you start

- You need a valid health card to use this service. Nova Scotia and other Canadian health care cards are permitted.
- · You need a telephone number in case we have to contact you.
- We recommend you provide an email address when you book your appointment. This will be used to send confirmation and reminder messages as well as to provide your vaccination record.



### After you book your appointment

 You will be asked to complete a COVID-19 screening form and an immunization consent form.

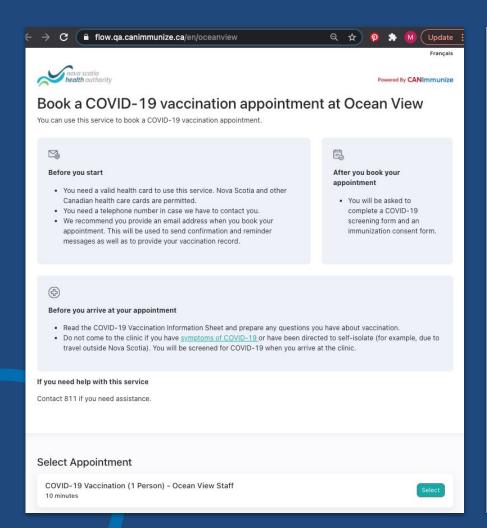


#### Before you arrive at your appointment

- Read the COVID-19 Vaccination Information Sheet [Click Here] and prepare any questions you have about vaccination.
- Do not come to the clinic if you have "symptoms of COVID-19" [Click Here] or have been directed to "self-isolate" (for example, due to travel outside Nova Scotia). You will be screened for COVID-19 when you arrive at the clinic.

#### If you need help with this service

Contact 811 if you need assistance.



#### Select Appointment Contact Information Data Collection Notice Information contained in this online form is collected, used and disclosed in accordance with Government of Nova Scotia's Health Information Privacy and Management Act and other applicable laws. Read about how we protect your First Name \* Last Name \* Please enter your name exactly as it appears on your health card. Preferred Name Preferred Pronoun Date of Birth Month \* Day \* Year \* V Gender \* Phone Number \* Street Address \* Unit/Apt. # City \* Postal Code \* **Email Address** Confirm Email Address Health Card Type \* Health Card Number \*





# Sleeves up, Yukon. The future is looking bright.

A safe and effective COVID-19 vaccine has arrived in Yukon and suddenly there's light on the horizon.

Yukon is getting enough vaccine to immunize 75% of the eligible population within the 1st 3 months of the year.

Vaccine clinics have now begun in some rural Yukon communities and limited clinics have started in Whitehorse.

You must book an appointment to get the vaccine if you live in Whitehorse. In rural Yukon communities, where internet connectivity may be an issue, appointments are strongly recommended but walk-ins are welcome.

You can currently book appointments online in:

Burwash Landing and Destruction Bay;



### Book a COVID-19 vaccination appointment at Burwash Dbay Clinic

You can use this service to book a COVID-19 vaccination appointment.



#### Before you start

- You need a valid health care card to use this service. Yukon and other
  Canadian health care cards are permitted. When entering health care number,
  enter numbers only and no spaces or dashes.
- . You need a telephone number in case we have to contact you.
- We recommend you provide an email address when you book your
  appointment. Confirmation and reminder messages will be sent to your email
  address from Government of Yukon (sender email address will be
  noreply@canimmunize.ca).



#### After you book your appointment

 You will be asked to complete a COVID-19 screening form.



#### Before you arrive at your appointment

- . Read about getting vaccinated for COVID-19 and prepare any questions you have about vaccination.
- Do not come to the clinic if you have <u>symptoms of COVID-19</u> or have been directed to <u>self-isolate</u> (for example, due to travel outside Yukon). You will be screened for COVID-19 when you arrive at the clinic.

#### If you need help with this service

Contact us at covid19info@gov.yk.ca or phone 1-877-374-0425 if you need assistance.

#### Select Appointment

Change
30 minutes

\*\*Change\*\*

\*\*Change\*\*

\*\*Change\*\*

\*\*Change\*\*

\*\*Appointment times are shown in MST.\*

\*\*Tuesday, February 2

10:20am 10:40am 10:50am 11:10am 11:20am 11:30am 11:40am 11:50am 12:00pm 12:10pm 12:20pm

12:30pm 12:40pm 12:50pm 10:50am 11:10pm 12:20pm 1:30pm 1:40pm 1:50pm

\*\*View More Availabilities\*\*\*

----- Forwarded message -----

From: CANImmunize < noreply@canimmunize.ca>

Date: Sunday, June 6 2021 at 2:38 PM EDT

Subject: [qa] Book Your Second COVID-19 Vaccination Appointment

To: kathryndenize+paulo@canimmunize.ca

#### **Book Your Appointment**

Paulo Pfizer,

You can now book your second COVID-19 vaccination appointment.

Click the button below to book your appointment.

Book My Second Appointment

Do not share this link, it is unique to you. By clicking this link, you will book a second dose appointment under your name. You will need a Nova Scotia health card number to book. If you do not have one, contact 1-833-797-7772

Only clinics with dates available within the appropriate date range for your dose 2 vaccine will be shown. Please check back regularly if no appointments are available. More appointments are being added regularly.

----- Forwarded message ------

From: CANImmunize < noreply@canimmunize.ca>

Date: Saturday, June 5 2021 at 10:50 AM EDT

 $Subject: \cite{Mathematical Subject: Qaligner Proposition} Appointment Confirmation: Your second dose COVID-19 vaccination appointment Confirmation: Appointment Confirmation appointment Confirma$ 

To: kathryndenize+patty@canimmunize.ca

#### **Appointment Confirmation**

Hello Patty Pfizer,

Your second dose COVID-19 vaccination is confirmed for <u>Monday</u>, <u>June 28</u>, 2021 at 3:00 PM. If you would like to reschedule to a sooner date, please click the button below.

**Save this email** and use the button below to view or change your appointment details.

Manage my Dose 2 Appointmen

You can reschedule your second dose COVID-19 vaccination appointment at any time. Rescheduling your appointment is optional and availability is based on vaccine supply. By clicking the button above, you will only be shown dates within the appropriate date range for your dose 2 vaccine. If no appointments are available, please check back as more appointments are being added regularly.

--- Forwarded message -----

From: Nova Scotia Health Authority <noreply@canimmunize.ca>

Date: Sunday, June 6 2021 at 9:32 AM EDT

Subject: [qa] Your Digital COVID-19 Immunization Record

To: kathryndenize+amanda@canimmunize.ca



### Thank you for getting your COVID-19 vaccination!

Amanda AZ, thank you for getting your COVID-19 vaccination!

Nova Scotia Health has partnered with CANImmunize to make it easier for you to keep track of your COVID-19 vaccination records and receive reminders when future COVID-19 immunizations are due.

This is your official COVID-19 immunization record. Please ensure you print a copy and store it in a safe place for future personal use. To view and/or print your vaccination details press the button below. Please have your Health Card number ready to access your digital immunization record.

Access My Digital Vaccination Recor

Take part in a COVID-19 vaccine safety survey. Register at:

COVID-19 Vaccine Safety Surve



I effortlessly re-scheduled my second Covid-19 vaccine appointment this morning for 2 weeks earlier than original date. Props to @nshealth @CANImmunize @StrangRobert @nsgov for the smooth vaccine delivery program in Nova Scotia.

7:12 AM · Jun 8, 2021 · Twitter for iPhone



Steve (He, Him) @firepuncher

Oh my God. I had my second dose (Pfizer) scheduled for next Wednesday but I was checking out the @CANImmunize site and it let me reschedule my jab to tomorrow morning!!! Is it normal to be nervous/excited fkkkk very emotional too.

8:55 AM  $\cdot$  Jun 8, 2021  $\cdot$  Twitter for Android



Please enter the following information to access your COVID-19 vaccination records.

#### Last 4 digits of your health card number



If you are having difficulties accessing your immunization record, please contact Health PEI at 1-844-975-3303.

Figure 1. Immunization receipt landing page



### Your Digital Immunization Record

Below you can find a summary of your COVID-19 vaccination record.

This is your official COVID-19 immunization record. Please ensure you print a copy and store it in a safe place for future personal use.

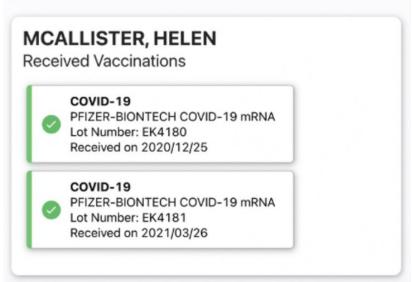
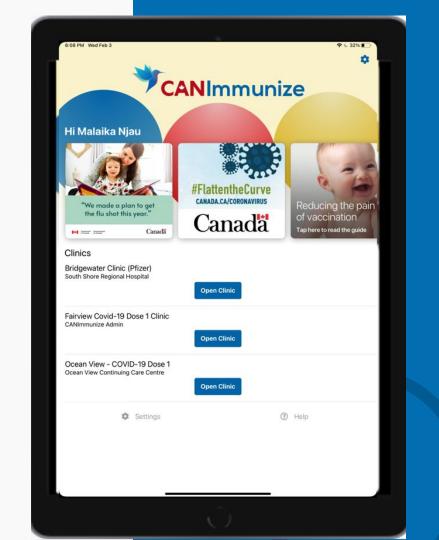


Figure 2. Digital immunization receipt mock up

# CANImmunize Clinic Mode

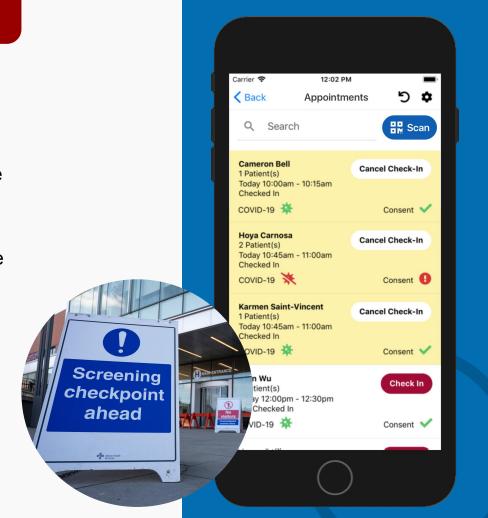
- Built into the existing CANImmunize app
- Configurable to support your clinical workflows
- Can be configured as a SMART on FHIR client
- Fine-grained access control can be implemented to restrict volunteer access to personal health information
- Greeter mode and Immunizer mode



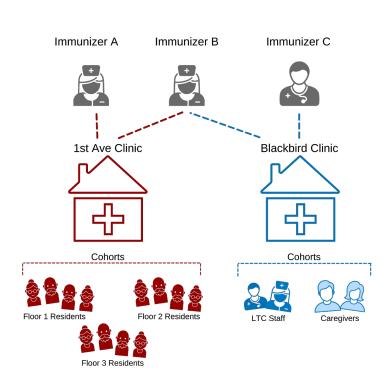
## GREETER Checks in Patient

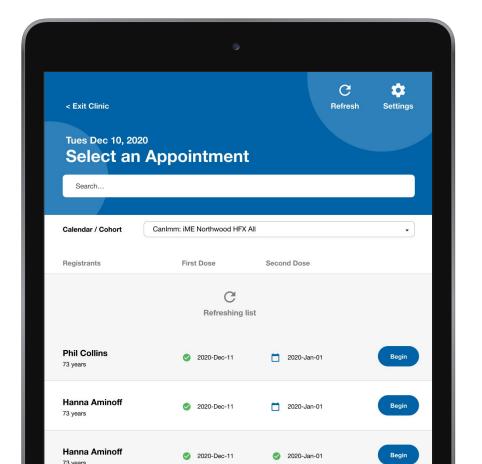
### **Greeter Mode**

- Greeter mode lets non-clinical staff access the appointment schedule, check-in patients, and mark patients as no-shows.
- Users logged into a Greeter mode account are not able to see any personal health information.
- Greeters can scan the barcodes in appointment confirmation emails for contact-less check-in of patients.

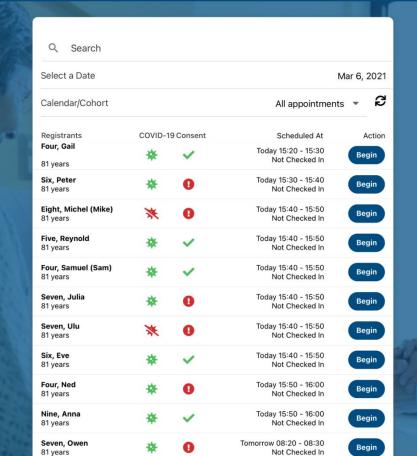


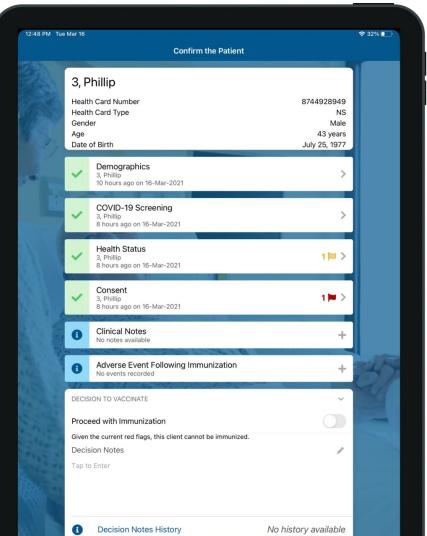
### Immunizer

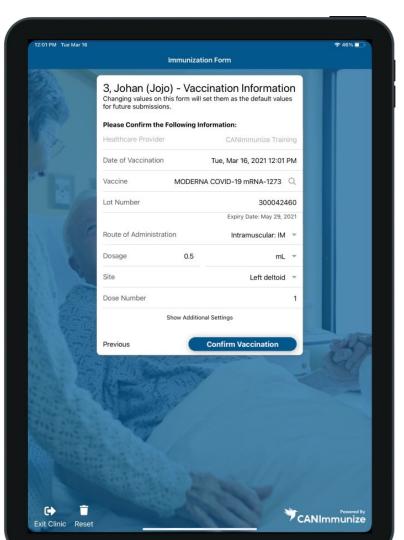




#### Clinic Roster

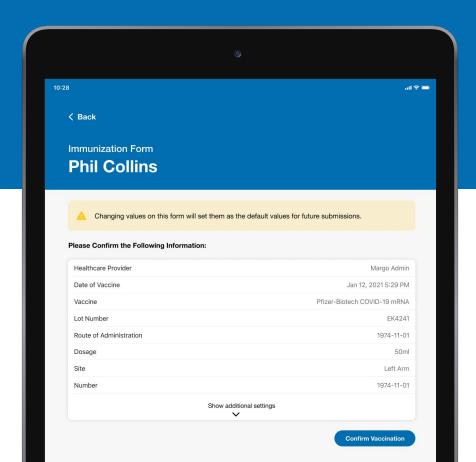


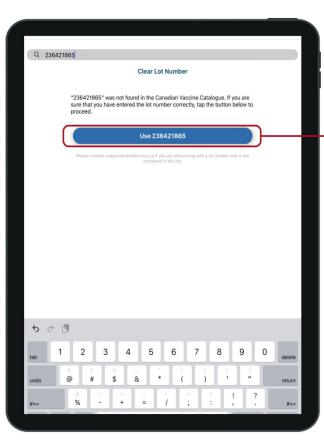






# Simple, fast, standards based







#### noreply@canimmunize.ca











#### Welcome to CANImmunize!

Before you get started, please verify your email address.

If you're having trouble with the button above, copy and paste the URL below into your web browser.

https://sync-cf2-1.canimmunize.ca/api/v2/confirm?email=malaika%2Bnsadm% 40canimmunize.ca&confirmationCode=048454&lang=en&mode=clinic

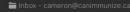
© 2017 CANImmunize. All rights reserved.

The CANImmunize Team Ottawa Hospital Research Institute, Civic Campus 1053 Carling Avenue, Box 684

#### Nova Scotia Health

[qa] Your Digital COVID-19 Immunization Record

To: cameron@canimmunize.ca





Powered By CANImmunize

#### Thank you for getting your COVID-19 vaccination!



MARY-JOE, thank you for getting your COVID-19 vaccination!

Nova Scotia Health has partnered with CANImmunize to make it easier for you to keep track of your COVID-19 vaccination records and receive reminders when future COVID-19 immunizations are due.

This is your official COVID-19 immunization record. Please ensure you print a copy and store it in a safe place for future personal use. To view and/or print your vaccination details press the button below. Please have your Health Card number ready to access your digital immunization record.

Access My Digital Vaccination Record



Just Now

CANImmunize: Bruyère Your Digital Immunization Record

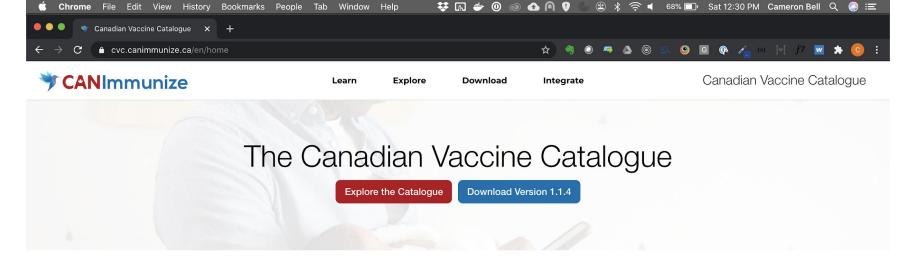
Thanks for getting your flu shot! Press the button below to access your digital immunization record.

### Security

- Hosted on AWS in Canadian region.
- Security monitoring and maintenance provided by iSecurity.
- TRA and penetration test performed on Clinic Flow by CGI in December 2020
- Information security program targets alignment with NIST Cybersecurity Framework and ISO/IEC 27001.
- Can support authentication with SAML or OAuth/OpenID Connect enabled Identity Providers.







#### **About the Catalogue**

The Canadian Vaccine Catalogue (CVC) is the comprehensive, standards-based source-of-truth resource for vaccine terminology and vaccine product information in Canada. It has been funded by the Public Health Agency of Canada and is currently developed and maintained by the CANImmunize team.

Subscribe to CVC Updates

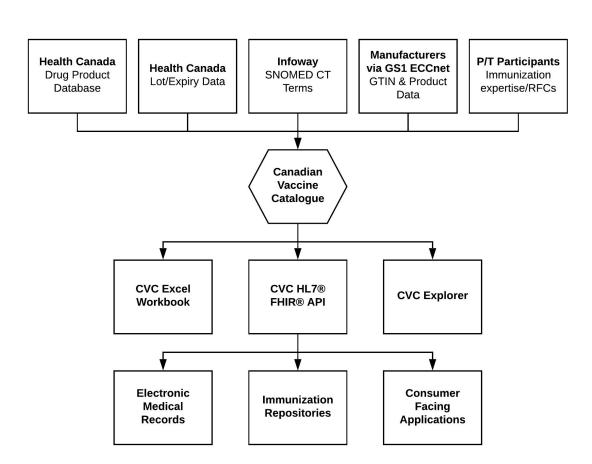
#### What you need to know

- The catalogue is intended for use by health informatics and IT professionals developing digital health information systems that require up-to-date standardized vaccine terminology and product data.
- New versions of the catalogue will be released monthly.
- The catalogue is designed to extend the Pan-Canadian Immunization SNOMED CT® Reference Sets developed by Canada Health Infoway.



### What is the CVC?

- The Canadian Vaccine Catalogue (CVC)
  is the comprehensive, standards-based
  source-of-truth resource for vaccine
  terminology and vaccine product
  information in Canada.
- Supported by Canada Health Infoway, and previously by the Ontario MOHLTC and PHAC. Developed and maintained by CANImmunize.
- Used in BC and ON to configure their provincial immunization repositories, as well as by other jurisdictions to some extent.







### The Science

Based on best practices in hospitals for influenza vaccination and schools for pediatric vaccination.

**10%** 

A 10% increase in influenza immunization rates reduced lost work days by 10% <sup>1</sup>

**20%** 

Digital reminders increased vaccination rates by 20% <sup>2</sup>

**x2** 

Emerging COVID-19 variants require 2 doses of vaccine to be protected <sup>3</sup>

# What is CANImmunize for Employers?

A standard of practice based on science.

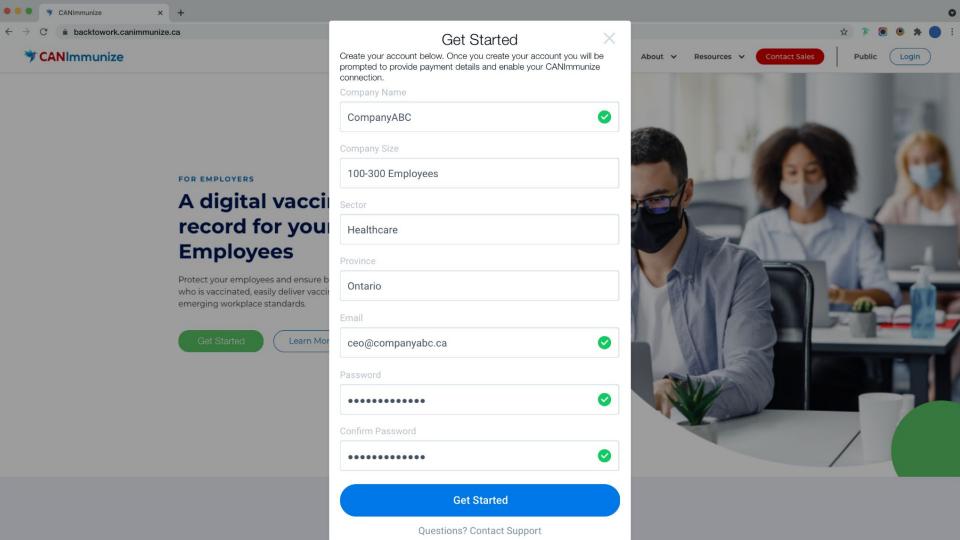
<u>Standard of practice:</u> Hospital and school policies for unvaccinated individuals. Individuals don't have to be vaccinated but are told to stay home for their own protection in the event of cases associated with the institution.

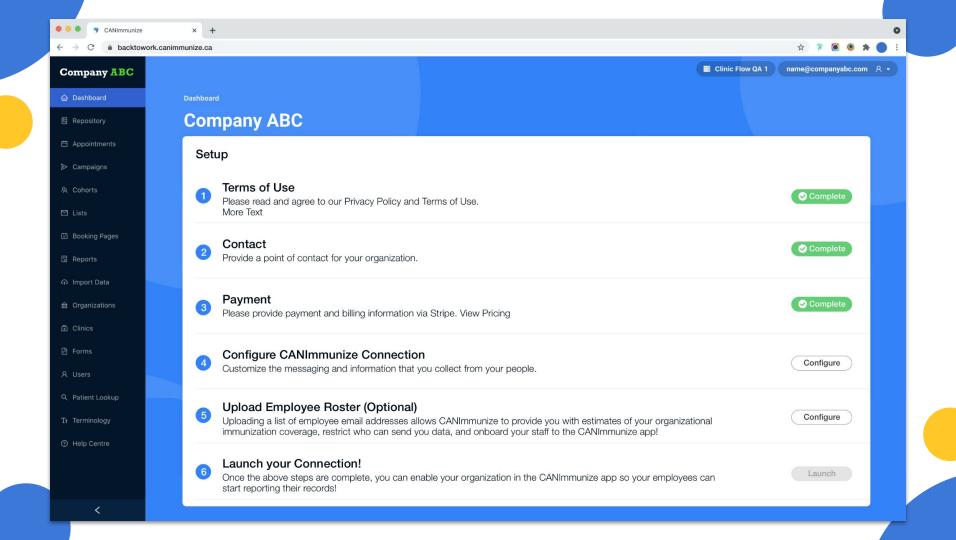
<u>Science:</u> Protect unvaccinated individuals, prevent community spread, keep businesses open in day-to-day operations.

<u>Science:</u> Digital messages improve vaccination rates by 20%. Every 10% increase in influenza immunization reduces workdays lost by 10%.

### **How it works**

- 1. Company signs up to be a Connect partner via the CANImmunize website.
- 2. Company fills in information and can upload a cohort of employees in the system to be able to assess vaccination coverage.
- 3. If employees have the CANImmunize app, they will be prompted to connect their digital vaccination record to your company. If they don't, employers request that employees download it and connect to your company.
- 4. Employer requests employees document their COVID-19 vaccines in the CANImmunize app and upload proof of immunization.
- 5. Employer adjudicates vaccination record and determines if they are valid.
- 6. Employers can monitor vaccination coverage via the CANImmunize dashboard, enabling data-driven decision making to manage the business realities of COVID-19.
- 7. If a COVID-19 case is associated with the workplace, the system will send emails to employees to either stay home or have rapid testing done on site.

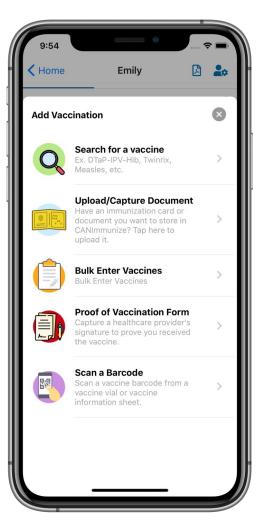












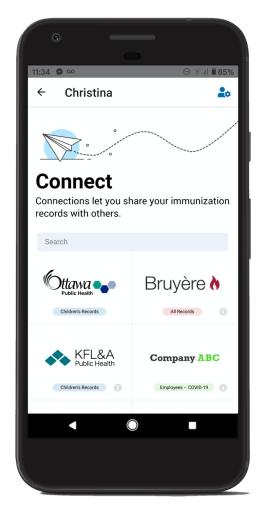






### **Helena Patterson**

Helena works at CompanyABC and reports her COVID-19 vaccination record to her employer.





### **John Doe**

John is a nurse at Bruyere and uses CANImmunize to share his vaccination status with Occupational Health.

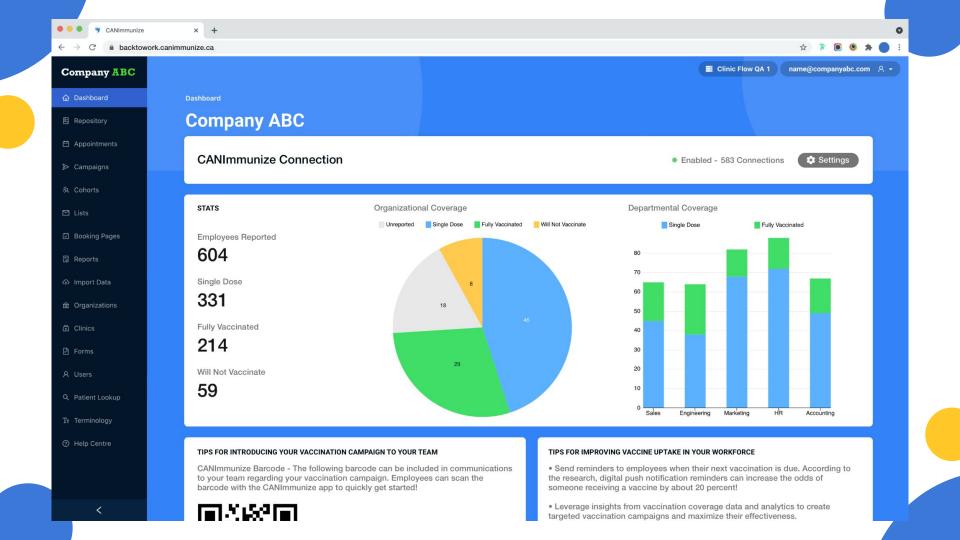
# Healthcare Workers

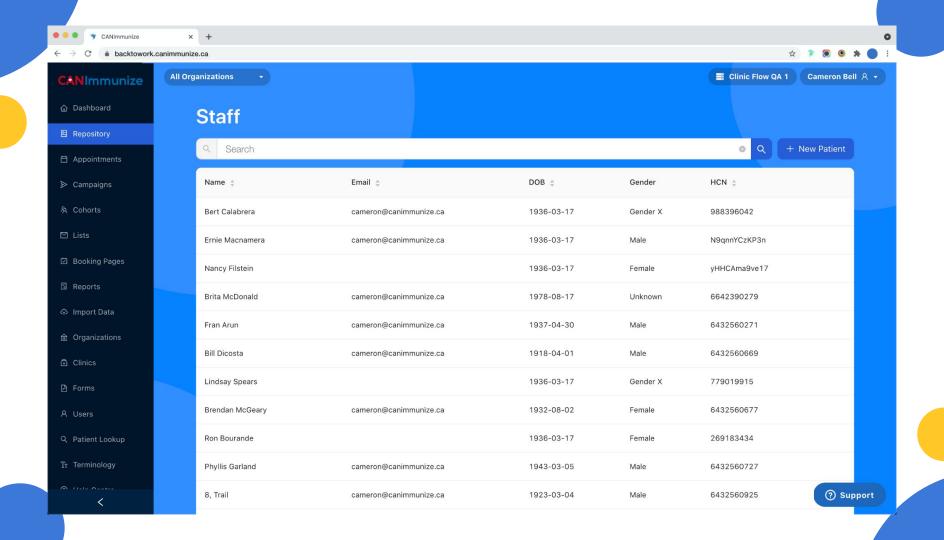






Healthcare workers track their immunizations using CANImmunize so they can share those records with their employers.







# **APIs & Integration**

 CANImmunize has an HL7® FHIR® API that can be used to develop integrations between the CANImmunize system and other clinical or occupational health information systems.

### **Benefits**

- 1. Avoid preventable shutdowns
- 2. Reduce work days lost due to illness
- 3. Maximize immunization rates using digital strategies
- 4. Protect workers health and prevent spread to the community
- 5. Prepare for boosters and what is expected to be a bad influenza season
- 6. If needed, can facilitate on-site vaccination programs using Clinic Flow

**Least-restrictive measure that protects public health** 

# Our Learnings

- This is hard!
- Partnership is key Science needs to drive design
- Agile processes are critical product is always changing (as is the rollout)
- Difficult to formally evaluate it works or it doesn't
- The vaccine rollout is accelerating development of infrastructure that can help with other campaigns and/or health issues



# Thank you & Questions

