

Building a real-time COVID data analytics hub in Ontario



Collaborative Insights. Transparent Data. Community Driven.



The Context

March 15...

ICUs are already full?!?

Life pretty much as usual...

How are we going to get action?!?



Howsmyflattening.ca | gitlab.com/howsmysflattening

Q Popular Latest

The Atlantic

IDEAS

The Extraordinary Decisions Facing Italian Doctors

There are now simply too many patients for each one of them to receive adequate care.

MARCH 11, 2020

Yascha Mounk

Contributing writer at *The Atlantic*



CLAUDIO FURLAN / LAPRESSE / AP

TWO WEEKS AGO, Italy had 322 confirmed cases of the coronavirus. At that point, doctors in the country's hospitals could lavish significant attention on each stricken patient.

One week ago, Italy had 2,502 cases of the virus, which causes the disease known as COVID-19. At that point, doctors in the country's hospitals could still perform the most lifesaving functions by artificially ventilating patients who experienced acute breathing difficulties.

[Elise A. Mitchell: The shortages may be worse than the disease]

Today, Italy has 10,149 cases of the coronavirus. There are now simply too many patients for each one of them to receive adequate care. Doctors and nurses are unable to tend to everybody. They lack machines to ventilate all those gasping for air.

MORE BY YASCHA MOUNK

Authoritarian Populism: Six Classic Moves. The Response to COVID-19 Uses Five of Them.

KRISTY PARKER AND YASCHA MOUNK

For the First Time, I'm Doubting My Decision to Come to America

YASCHA MOUNK

This Is Just the Beginning

YASCHA MOUNK

The Problem

Data

Frozen Analysis

Speed

Fact From Fiction

Public Transparency



Solution

A collaborative of over 100 data minded individuals that collects relevant real-time data to help inform and monitor Ontario's response to COVID-19....

- Real time data + viz
- Extremely agile
- Credible



Results



Data

Datasets

COVID-19 is changing the world rapidly. We need to move faster.

We present our growing data sources relevant to Ontario and comparisons in a single up to date Dataset.

Data Category

☒ Cases ☒ Intervention ☒ Mobility ☒ Testing ☒ Capacity ☒ LTC

Data Region

☒ Canada ☒ International ☒ Ontario

Cases Data Sets

Canada Case Data

Source: Government of Canada and News Media

Patient level data of covid cases in Canada. Compiled from publicly available information on confirmed and presumptive positive cases during the ongoing COVID-19 outbreak in Canada. Data are entered with each line representing a unique case, including age, sex, health region location, and history of travel where available

[Download Data](#)

Details:

Data feedtype: Automatic

Refresh rate: Daily

[Source Link](#)

Contributor: COVID-19 Canada Open Data Working Group

[Contact Link](#)

Canada Mortality Data

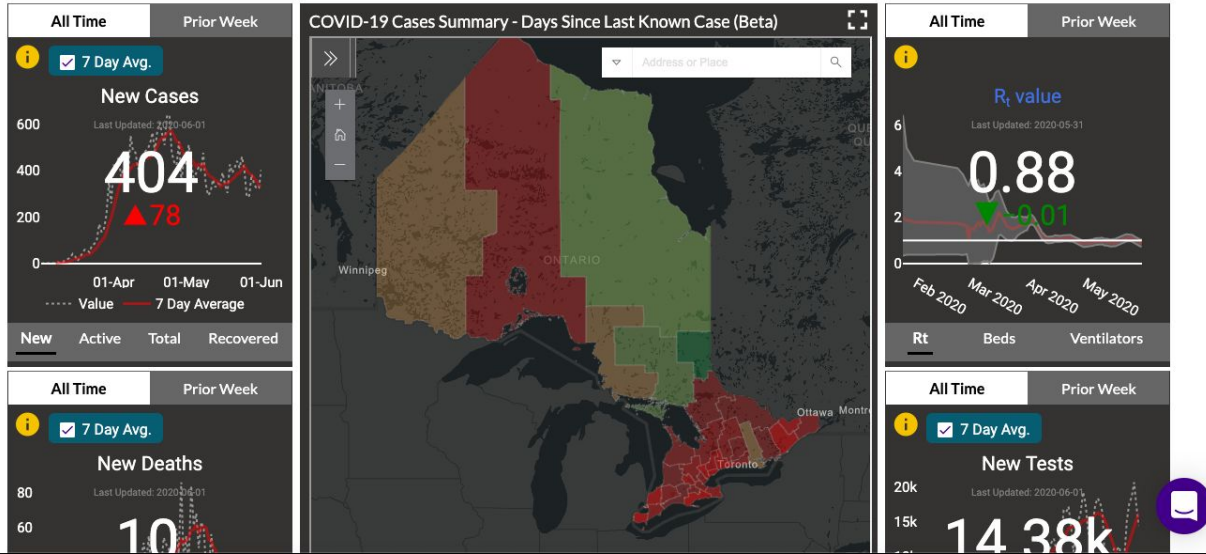
Details:

Data feedtype: Automatic



Thirty Seven Dashboards

Ontario



Analysis

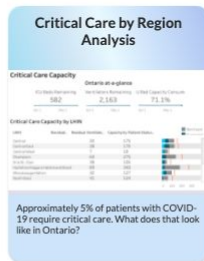
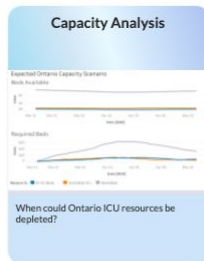
Ontario-specific COVID-19 Analysis

Our group publishes analyses that provide further Ontario-specific insights as we monitor performance to flatten the curve. Select an analysis below the dashboard for an in-depth exploration.

Published This Week

- ☒ Capacity
- ☒ Cases
- ☒ Interventions
- ☒ Predictive
- ☒ Regional
- ☒ Social Determinants
- ☒ Testing
- ☒ Trajectory

Capacity Analysis



Analysis

7-Day Moving Average of Cases by Age Group and Setting

[Collapse Description Below](#)

Overview

These two graphs display the weekly average of cases by age group in Ontario, over time. The graph on the left displays cases that are linked to known outbreaks (e.g. in hospitals or long term care homes). The graph on the right displays cases that are non-outbreak related (i.e. occurring in the community at-large).

Authors

Farbod Abolhassani & Vinyas Harish

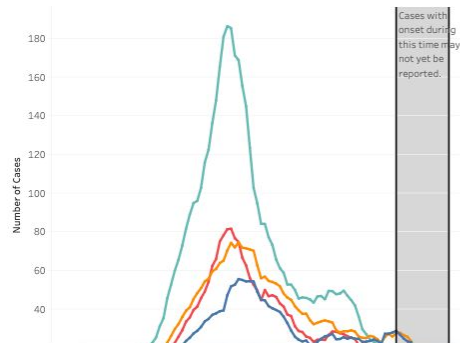
Special thanks to Mark Fruman for suggesting to split this visualization between outbreak and non-outbreak related settings.

Visualization Notes

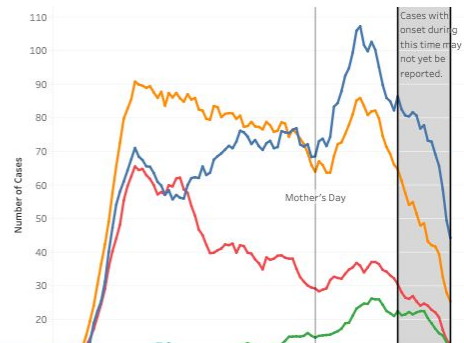
Ages are binned into 20-year buckets. Each colour corresponds to a different age group, as shown in the legend. Note that case counts within the grey shaded area may still be subject to change as the Ministry continues to update their records with more information as it becomes available.

7 Day Moving Average of New Cases By Age and Outbreak

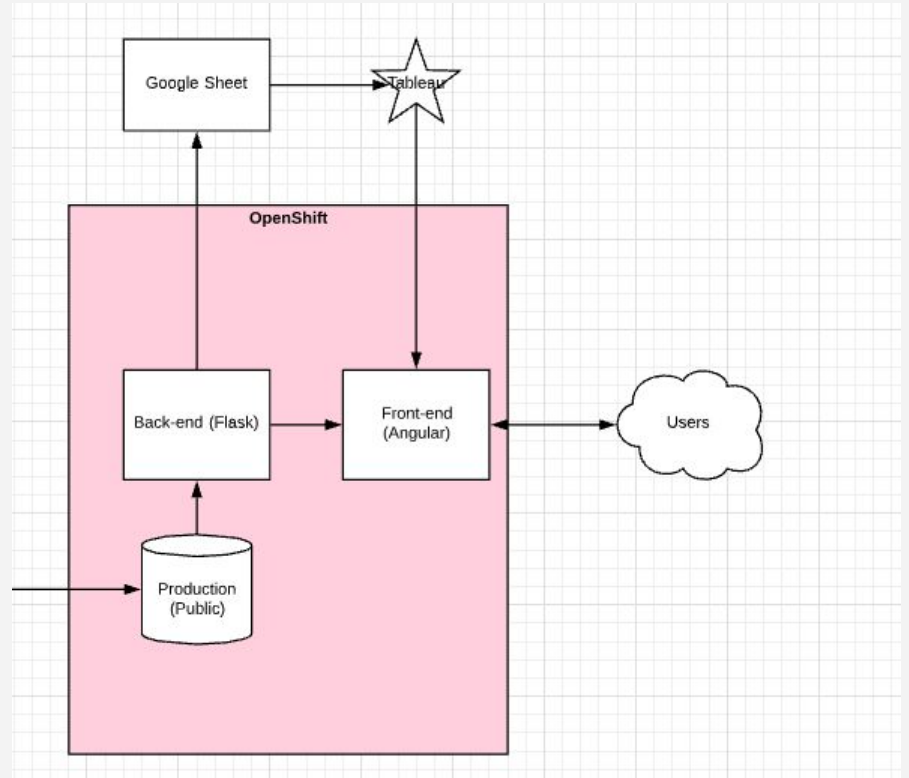
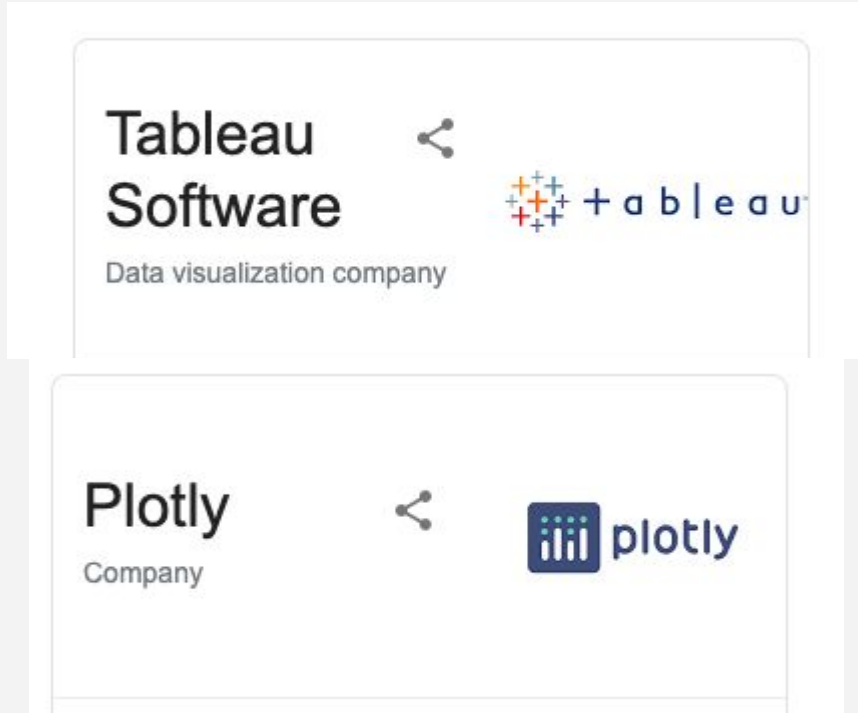
Outbreak Related



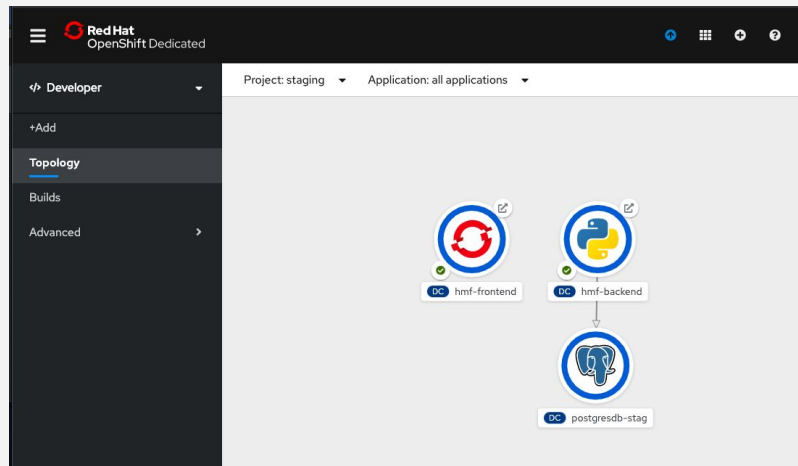
Non-outbreak Related



The How



The How



The screenshot shows the Red Hat OpenShift Administrator console interface. The left sidebar has an 'Administrator' role selected. The main area displays the 'Project: staging' and 'Cron Jobs' view. A 'Create Cron Job' button is visible. Below it is a table listing the cron jobs in the 'staging' namespace.

Name	Namespace	Schedule	Concurrency Policy
canada-cron	staging	0 3 * * *	Replace
google-cron	staging	* / 60 * * * *	Replace
international-cron	staging	0 3 * * *	Replace
kaggle-cron	staging	0 3 * * *	Replace
mobility-cron	staging	0 3 * * *	Replace
npi-cron	staging	0 3 * * *	Replace
ontario-cron	staging	0 15 * * *	Replace
plots-cron	staging	0 15 * * *	Replace



The How

```
.gitlab-ci.yml 3.35 KB
Edit Web IDE Lock Replace Delete

1 image: ebits/openshift-client
2
3 stages:
4   - development
5   - staging
6   - production
7   - cleanup
8
9 variables:
10  TEMPLATE_FILE: "./ocp_template/hmf-frontend-template.yaml"
11  TEMPLATE_NAME: hmf-frontend
12  COMPONENT_NAME: hmf-frontend
13
14 .deploy: &deploy
15 before_script:
16   - oc login --server="$OPENSIFT_SERVER" --token="$OPENSIFT_TOKEN" --insecure-skip-tls-verify
17 script:
18   #- mv $CONFIG_FILE src/assets/config/config.json
19   #- RESULT=0
20   #- oc create configmap $APP-config --from-file=src/assets/config/config.json 2> /dev/null || RESULT=$?
21   #- echo $RESULT
22   #- (if [ "$RESULT" == 1 ]; then
23     #   oc delete cm $APP-config;
24     #   oc create configmap $APP-config --from-file=src/assets/config/config.json;
25     #   oc label configmap $APP-config app=$APP;
26   # fi);
27   #- mv $CONFIG_FILE src/assets/config/config.json
28   - oc apply -f $TEMPLATE_FILE
29   - RESULT=0
30   - oc get services $APP 2> /dev/null || RESULT=$?
31   - echo $RESULT
32   - (if [ "$RESULT" == 1 ]; then
```



The Team

Meet The Team

Our team of experts stands behind the mission of fighting and ending COVID-19.

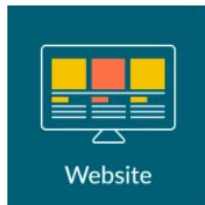
240+ Slack Members

15+ data analyses on Ontario's response

20+ KPIs monitored in near real-time

If you want to get involved, check out our [Gitlab](#).

Our team works on



Our People

Leaders	3
Maintainers	9
Committers	14
Contributors	40
Advisors	10
All	76

Dr. Ashleigh Tuite

PhD
University of Toronto

Kavya Anchuri

BSc, MHS, MD
Candidate
University of Calgary

Isha Berry

PhD Candidate
University of Toronto

Dandi Feng

MI
Design Lead
Porter Airlines

James Hooks

BSc
University of Toronto

Sophie Hu

MD/MSc student
University of Calgary



[Howsmyflattening.ca](https://howsmyflattening.ca) | gitlab.com/howsmyflattening

Challenges

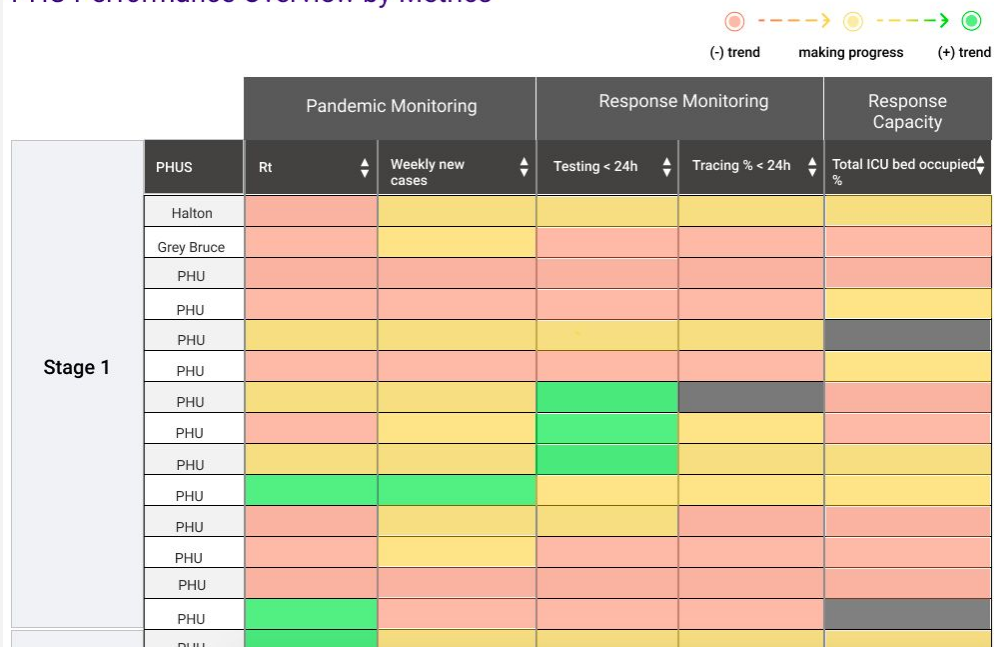
Ontario itself has discordant data...

A	B	C	D	E	F	
Row_ID	Accurate_Episc	Age_Group	Client_Ge	Case_Acq	Outcome1	Out
27493	12:00:00 AM	<20	FEMALE	Informatic	Resolved	Yes
6146	5/23/2002	<20	FEMALE	Contact of	Resolved	(bl
3458	1/1/2020	50s	MALE	Contact of	Resolved	(bl
9337	1/1/2020	80s	MALE	Neither	Resolved	(bl
27300	1/10/2020	40s	FEMALE	Contact of	Resolved	Yes
6258	1/15/2020	60s	MALE	Informatic	Resolved	(bl
15252	1/21/2020	50s	MALE	Travel-Rel	Resolved	(bl
14993	1/22/2020	50s	FFMAI F	Travel-Rel	Resolved	(hl




Whats Next: Reopening

PHU Performance Overview by Metrics




Whats Next: Open Data Hub

**OPEN DATA HUB**
AI Platform powered by Open Source

Welcome

Applications


Open Data Hub Applications



Launch Jupyter

JupyterHub


The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text.



Launch Argo

Argo

Argo Workflows is an open source container-native workflow engine for orchestrating parallel jobs on Kubernetes. Argo Workflows is implemented as a Kubernetes CRD



Launch Superset

Superset

Apache Superset is a modern, enterprise-ready business intelligence web application

- A rich set of data visualizations
- An easy-to-use interface for



Response



UNIVERSITY OF
TORONTO

CURRENT STUDENTS

ALUMNI

FACULTY & STAFF

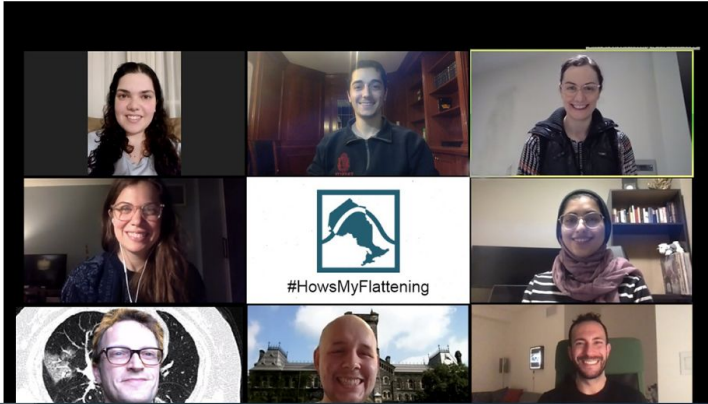
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#HowsMyFlattening? Group led by U of T community members creates one-stop shop for COVID-19 data



Howsmyflattening.ca | gitlab.com/howsmyleftening

The Star Edition
CHANGE LOCATION

THE STAR

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CANADA

‘We in Ontario are flying blind’ How top minds teamed up to give us the COVID-19 data the province couldn’t



By **Kevin Donovan** Chief Investigative Reporter
Wed., May 27, 2020 | 9 min. read

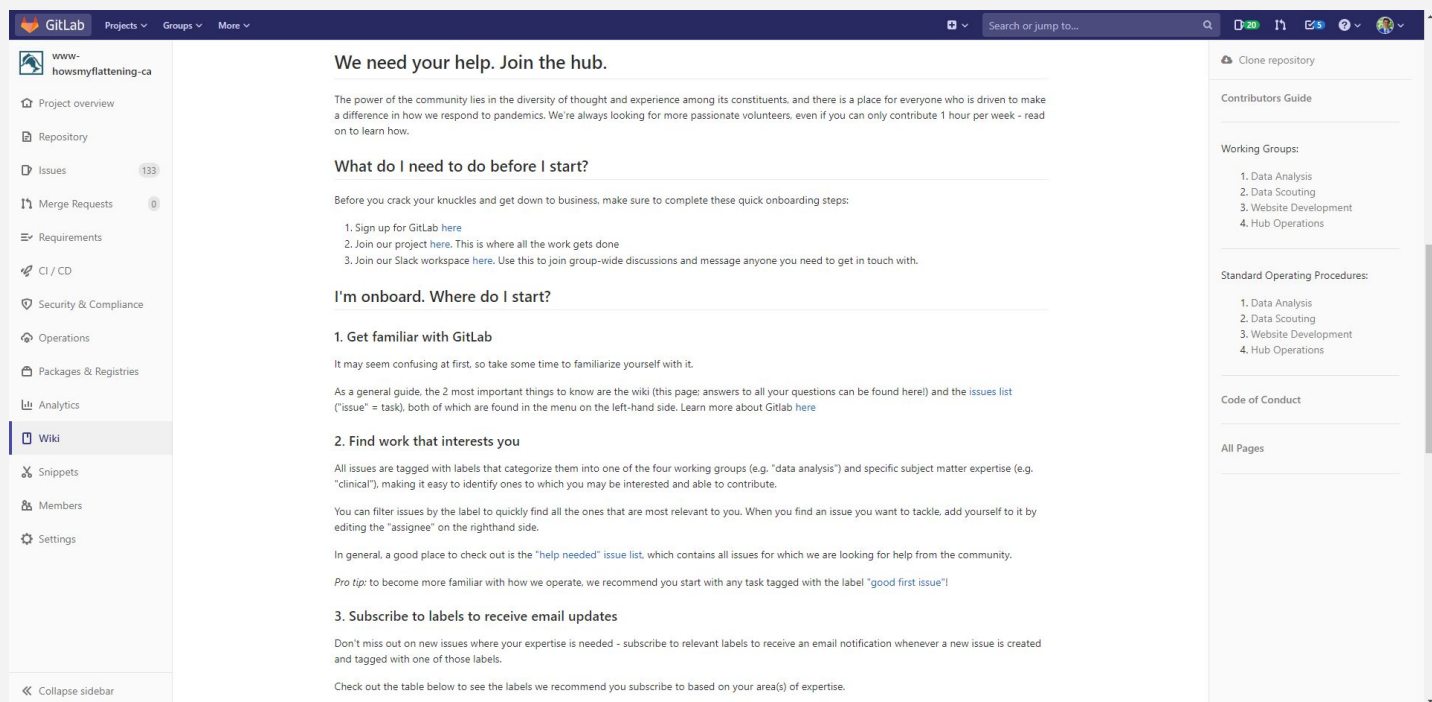


Response

1. "It is SO reassuring to have a group that is actually compiling data to track the spread and able to monitor the repercussions of reopening the economy in a timely fashion. Thank you, thank you. Stay safe all of you and thank you for trying to keep us all safe."
2. "This is excellent and relevant information. Thank you. **It has been lacking in Provincial public health Briefings and updates.**"
3. "Excellent work on making data visible, transparent and accessible. I wish I had know about this site earlier as I was collecting and maintaining my own data. This has everything I need and IMHO this should be the dashboard for Ontario. Many thanks"
4. **"The Canadian way, with our reliance on science and data, our openness, provides a great comfort."**
5. "I want to say thanks a million to all the selfless passionate volunteers for sharing your gift of knowledge without any monetary gain to improve the health outcomes of Ontarians. It is an angelic mission and I'm sure you will be richly blessed for your compassionate efforts."
6. "Finally....someone has provided up to date and specific information. **I live in Brighton Ontario and under normal times I visit Belleville a lot for shopping etc. I was never able to pin down exactly how those places were affected. Til now...thank you.**"
7. "You all are doing incredible work and should be commended."



Join US! Contribute Analysis + Data + Skillset



The screenshot shows the GitLab interface for the project 'www-howsmyflattening-ca'. The left sidebar contains navigation links: Project overview, Repository, Issues (133), Merge Requests (0), Requirements, CI / CD, Security & Compliance, Operations, Packages & Registries, Analytics, Wiki (selected), Snippets, Members, and Settings. The main content area is titled 'We need your help. Join the hub.' and contains the following sections:

- We need your help. Join the hub.**

The power of the community lies in the diversity of thought and experience among its constituents, and there is a place for everyone who is driven to make a difference in how we respond to pandemics. We're always looking for more passionate volunteers, even if you can only contribute 1 hour per week - read on to learn how.
- What do I need to do before I start?**

Before you crack your knuckles and get down to business, make sure to complete these quick onboarding steps:

 1. Sign up for GitLab [here](#)
 2. Join our project [here](#). This is where all the work gets done
 3. Join our Slack workspace [here](#). Use this to join group-wide discussions and message anyone you need to get in touch with.
- I'm onboarded. Where do I start?**
 - 1. Get familiar with GitLab**

It may seem confusing at first, so take some time to familiarize yourself with it.

As a general guide, the 2 most important things to know are the [wiki](#) (this page; answers to all your questions can be found here!) and the [issues list](#) ("issue" = task), both of which are found in the menu on the left-hand side. Learn more about GitLab [here](#)
 - 2. Find work that interests you**

All issues are tagged with labels that categorize them into one of the four working groups (e.g. "data analysis") and specific subject matter expertise (e.g. "clinical"), making it easy to identify ones to which you may be interested and able to contribute.

You can filter issues by the label to quickly find all the ones that are most relevant to you. When you find an issue you want to tackle, add yourself to it by editing the "assignee" on the righthand side.

In general, a good place to check out is the ["help needed" issue list](#), which contains all issues for which we are looking for help from the community.

Pro tip: to become more familiar with how we operate, we recommend you start with any task tagged with the label "good first issue!"
 - 3. Subscribe to labels to receive email updates**

Don't miss out on new issues where your expertise is needed - subscribe to relevant labels to receive an email notification whenever a new issue is created and tagged with one of those labels.

Check out the table below to see the labels we recommend you subscribe to based on your area(s) of expertise.

The right sidebar contains links to 'Clone repository', 'Contributors Guide', 'Working Groups' (listing Data Analysis, Data Scouting, Website Development, and Hub Operations), 'Standard Operating Procedures' (listing the same four categories), 'Code of Conduct', and 'All Pages'.



Community in Action

The screenshot displays the GitLab 'Issue Boards' interface for the project 'www-howsmyflattening-ca'. The sidebar on the left provides navigation for various project features. The main content area is divided into four columns, each representing a different stage of the issue lifecycle: 'Open', 'todo', 'doing', and 'needs review'. Each column contains a list of issues, with titles, labels, and due dates. The 'Open' column lists issues like 'Change plotly layout conditionally on different devices on analysis page' and 'Deaths cases breakdown origin over time'. The 'todo' column includes 'Last updated...' for dashboard graphs and 'Create QA process for chat bot'. The 'doing' column shows 'Figure out in the news section' and 'Create a scraper to capture all info on this page'. The 'needs review' column features 'Description for Rt Tile' and 'Acceleration of cumulative cases for COVID19 in Ontario'. Each issue is associated with specific labels such as 'front-end', 'back-end', 'data analysis', and 'website development'.



Summary

60-day old **collaborative**

bringing **100+** talented people together

Showing value of **open** data + analytics mindset to *move quickly* to generate health insights

Putting them in 1 place (visually) to help inform decision-makers

Join us!





info@howsmyleftening.ca



[@howsmyleftening](https://twitter.com/howsmyleftening)



www.howsmyleftening.ca



www.gitlab.com/howsmyleftening/

