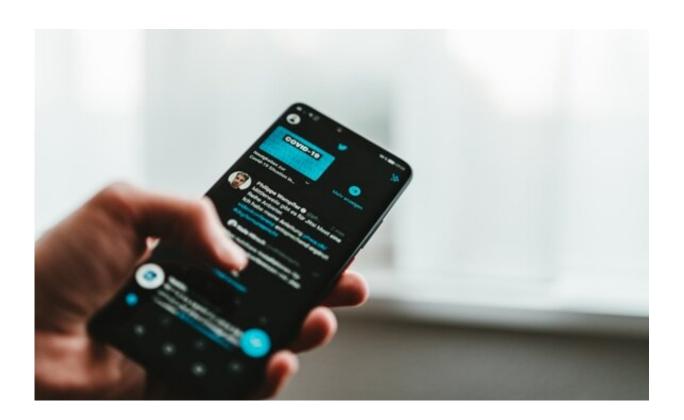# How Twitter can help inform public policy relating to mental and emotional well-being during social isolation

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Dal researchers have analyzed more than 1,000,000 tweets using the #stayathome hashtag to gain insight into how those in a 14-day quarantine period are coping emotionally. Credit: Claudio Schwarz/Unsplash photo

While the long-term emotional impacts of the COVID-19 pandemic are

yet to be fully understood, social media is providing useful insight into how those in social isolation are feeling and how this may be affecting emotional well-being. Insight could have the potential to help inform public health policy making and early intervention to support mental and emotional well-being.

New research from Dalhousie is using artificial intelligence (AI) to analyze the public emotions expressed through millions of tweets across the globe and identify trends that could make a significant impact in this area.

Bringing together researchers from Computer Science and Community Health and Epidemiology, the interdisciplinary team hopes their new findings and methodology can be used for public good, particularly during times where decision makers find themselves in unchartered territory.

## #stayathome

The unprecedented nature of the pandemic inspired the team to look to real-time public opinion through social media over more traditional survey methods, analyzing more than 1,000,000 tweets and using the #stayathome hashtag to gain insight into how those in a 14-day quarantine period are coping emotionally.

"For most people, social isolation is strange and what has happened during this period is that individuals are trying to connect with the outside world, and with others, using social media. Many people are expressing their emotions and reactions during lockdown and social isolation through these platforms," says Rita Orji (pictured left), Canada Research Chair in Persuasive Technology and associate professor in the Faculty of Computer Science. "Nobody really understands the impacts of new policies during this time. This is an important project as it

actually sheds light on the effects of these policies and how they are improving or harming people's health. This is the major motivator."

Swarna Weerasinghe, associate professor in the Department of Community Health and Epidemiology echoes the unique impact this type of research could have.

"The special thing about this approach is that we are capturing naturally flowing emotional feelings in tweets, it is very important for public health decision making to capture that," explains Dr. Weerasinghe. "In my area of research, we have to work together with computer scientists to expand our knowledge for the benefit of people."

## Deep Learning

A deep learning model developed by Hamed Jelodar, a Ph.D. student working with Dr. Orji and Stan Matwin (shown right), Canada Research Chair and director of the Institute for Big Data Analytics, made it possible for the team to classify tweets including #stayathome into various emotion categories and from there identify trends.

"Essentially, we collect tweets, then the basic tool used is a National Research Council of Canada resource, basically a dictionary that matches combinations of words and word sequences, to a particular type of emotion" says Dr. Matwin. "We then used deep learning to learn what makes a particular emotion."

"The scale classifies emotions into different categories including anticipation, anger and happiness, for example," Dr. Orji adds. "The system takes this and rates and classifies the tweets. So, combining tweets from certain times etc. you start to see some trends. For example, at this point of the isolation period, most people are anxious. Based on that, you start to see an average of what the population is feeling at a

particular time and we can tie that to what's happening in the world right now."

## Identifying global trends

The team hope to use these trends to help inform public policy and interventions that could support emotional well-being during major global events such as the COVID-19 pandemic.

"When we looked at the data, there is a clear classification of negative feelings and positive feelings," says Dr. Weerasinghe (shown left). "We found that anger was the one that had the highest increasing trend during the isolation period, people get more and more angry with time. We see this reflected in the media with picketing etc. This is something public health decision makers should pay attention to very seriously. Where is this anger coming from? Why are people going out and rioting? It's because of increased negative emotional feelings."

Dr. Matwin adds, "With machine learning we can predict where people are emotionally today and where they might be in a week. This could be extremely useful information for public health experts when making policies and identifying strategies to help people during times like this."

## Applying research to other domains

Dr. Orji stresses that this is just the beginnings of research that could be developed much further and applied to many other areas.

"We looked at a global reaction, rather than any particular segment. Possibly in our next round of research, we might narrow it down. Policies around the world are coming at different points in time, the rules are different and so are people's reactions. It would be good to

break it down and look at this across different countries who have handled it differently.

The methodology we are using here can actually be applied into other domains. If we adapt it, there are many other events happening across the world that people are publicly reacting to, for example political events. The methodology has application beyond health and beyond COVID-19."

Provided by Dalhousie University