Chapter 94
Coronavirus Pandemic (COVID-19): Emotional Toll Analysis on Twitter

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ABSTRACT

People are afraid about COVID-19 and are actively talking about it on social media platforms such as Twitter. People are showing their emotions openly in their tweets on Twitter. It's very important to perform sentiment analysis on these tweets for finding COVID-19's impact on people's lives. Natural language processing, textual processing, computational linguists, and biometrics are applied to perform sentiment analysis to identify and extract the emotions. In this work, sentiment analysis is carried out on a large Twitter dataset of English tweets. Ten emotional themes are investigated. Experimental results show that COVID-19 has spread fear/anxiety, gratitude, happiness and hope, and other mixed emotions among people for different reasons. Specifically, it is observed that positive news from top officials like Trump of chloroquine as cure to COVID-19 has suddenly lowered fear in sentiment, and happiness, gratitude, and hope started to rise. But, once FDA said, chloroquine is not effective cure, fear again started to rise.

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1. INTRODUCTION

On Dec. 12th 2019, in Wuhan City, Hubei Province, China, the Wuhan Municipal Health Commission (WMHC) reported 27 individuals infected by a new coronavirus. The new coronavirus designated initially as 2019-novel coronavirus (2019-nCoV), and subsequently Coronavirus Disease 2019 (COVID-19) by the World Health Organization (WHO). The same symptoms had been suffered by the patients, such as hard breathing, dry cough, and high body temperature. These symptoms made the Centers for Disease Control and Prevention (CDC) to denominate this disease as "severe acute respiratory syndrome coronavirus 2" or SARS-CoV-2. Most cases from the primary group has epidemiological connections with a market of living animal in Wuhan. The virus that causes the pneumonia was concatenated and it was discovered that it is a one of beta-coronavirus family and extremely identical to SARS-like BAT coronaviruses bat-SL-CoVZC45 and bat-SL-CoVZXC21 with 88% similarity, 79.5% homology with SARS, and 50% with MERS (Lu et al., 2020; Wu et al., 2020). An early research has been proceeded in January 2020 stated that among 41 patients (with average age nearly 49 years), positive for COVID-19 infection, half of them have chronic diseases, including diabetes 20%, cardiovascular disease 15%, and hypertension 15%. The symptoms appear in them were at most high body temperature 98%, cough 76%, and tiredness 44%. The COVID-19 severe complications in such patients included respiratory distress syndrome 29%, RNAaemia 15%, acute cardiac injury 12%, and other secondary infections. Of the total infected patients, 32% were assumed to be accepted to Intensive Care Unit (ICU). The death rate was 15% by far (Bastola et al., 2020).

Social media provides very easy and useful means of communication between people, where they share information and exchange opinions and show their sentiments on social problems. Whole world in connected that's why people from different nations, cultures and beliefs can communicate. E.g. people may share their problems directly to the ministry of health or foreign affairs by using tweets as a medium. Social media platforms these days provide us with a great opportunity to perform analytics about any evert, such as, football world cup, launch of new technology product, opinion of people on educational policies, political events, tsunamis, earthquakes and spread of diseases, etc. Most of the information on social media platforms is unstructured and unmanageable. Information gathering on social media platforms is very fast that it results a trouble of "Social Media information overload" (Bright et al., 2015; Amjad et al., 2020) and difficulties and confront regarding information processing and analytics (Schuller et al., 2015; Amjad et al., 2020).

Social media platform information is processed and analyzed for the use by public sector organizations, news agencies, government officials, political leaders and parties due to presence of public emotions and opinion in that data. E.g. new agencies select topics of talk shows based on the hashtag trends on twitter and government revise their policies based on people opinion and sentiments. In this time of COVID-19, its really very important to process information available on the social platforms specifically twitter and convert it into knowledge to help government officials take timely decisions. Through effective use of social media analytics, government may make policies and take decisions for people in a more authoritative way (WeGov, 2016; Amjad et al., 2020).

Faces are the most applicable way to express different emotions. Words also is another way to represent the emotions. The emotions such as happiness indicates joyful and cheerful, sadness emotion represents dismal or scream and anger represents shout and ebullition, and so on (Saif et al., 2013; Amjad et al., 2020). Several tasks require automatic emotions' recognition such as (Saif et al., 2013): (a) Directing the relations to use the suitable behavior due to the emotion (such as displeasure, contentment, relief, sorrow,