Tracking Adverse Events of COVID-19 Vaccines using Social Listening Platform – An Observational Study

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Background

Coronavirus disease (COVID-19) which is caused by the SARS-CoV-2 virus, remains a serious global public health crisis. One effective way to combat COVID-19 was the development of vaccines. However, vaccine hesitancy remains a concern. In March 2020 the lockdown imposed by the pandemic enhanced the use of social media websites worldwide. Social network analysis has the potential to address Adverse Effects Following Immunization (AEFIs) and misinformation about vaccines and vaccination.
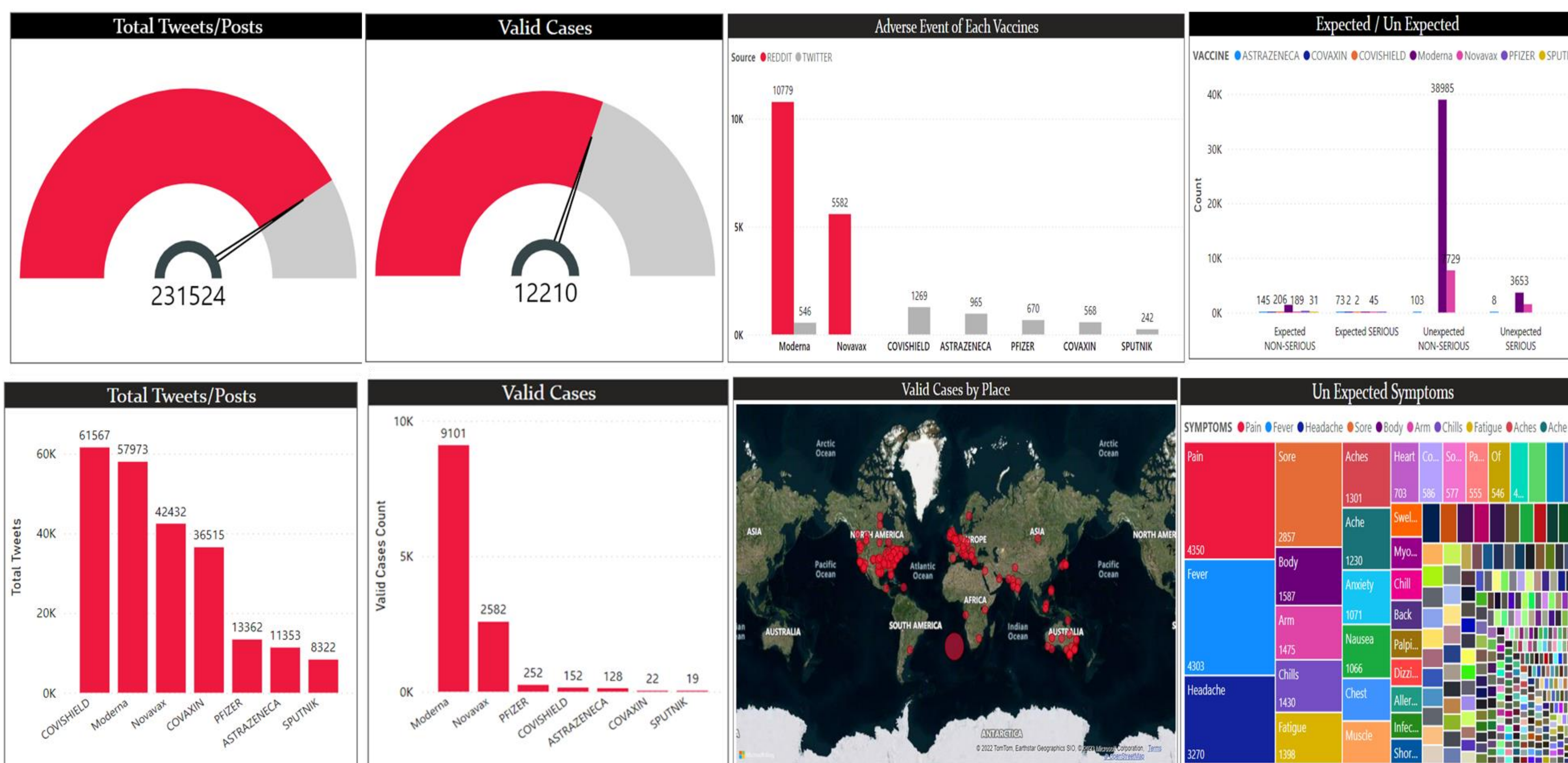
Specific Aims & Objectives

Aim : To monitor the discussion and to assess the Adverse Effect Following Immunizations(AEFIs)-related mentions in Social Media following Covid-19 vaccination.

Objectives: Provide in-depth analysis of collected data by accessing the Social media comments of beneficiaries and their vaccine schedules, cross-comparing the posted adverse events with the vaccine labels, studying the spectrum of adverse events on social media following vaccination, and analyzing trends, and providing suggestions to improve vaccine uptake, especially in low and middle-income countries.

Methods

We extracted and analyzed over 231,524 relevant Reddit (90159) and Twitter (141365) posts over a defined period (Oct 1, 2021, to Sep 30, 2022).
Our inclusion criteria had an identifiable reporter, patient, drug, and Adverse Event (AE). We filtered the data through our 3Analytics platform that automatically conducts AE surveillance on social media platforms using our Named Entity Recognition (NER) + Bidirectional Encoder Representations from Transformers (BERT) - Natural Language Processing (NLP) model to extract symptoms, classify AE, and analyze the demographic, frequency, and sentiment trends related to COVID-19 vaccines.

Graphs/Figures

Results

3Analytics COVID-19 AEFI search strategy spotted 12,210 relevant Reddit (11509) and Twitter (763) valid cases from 231524 posts over a year-long period. The following vaccine posts were observed. Moderna 57973 posts with 9101 valid cases, Novavax 42432 posts with 2582 valid cases, and Covishield 61567 posts with 152 valid cases. Other vaccines were Covaxin 36515 with 22 valid cases, Pfizer 13362 with 252valid cases, AstraZeneca 11353 with 128 valid cases, and Sputnik 8322 with 19 valid cases.

Conclusions

The Adverse Events Following Immunizations (AEFIs) of vaccines as discussed in social media is an important source of data that will aid in a better safety profile of the vaccine. The use of AI-driven data inputs and advanced statistics can help vaccine manufacturers, regulatory agencies, public health, and policymakers to have quick access and simplified data, which may help in addressing the questions with respect to vaccine safety, that may have been not seen earlier. **By doing so, we trust our findings support the use of social media as a tool to enhance vaccination acceptance.**

Acknowledgements

References

- Artificial Intelligence-Enabled Social Media Analysis for Pharmacovigilance of COVID-19 Vaccinations in the United Kingdom: Observational Study (https://pubmed.ncbi.nlm.nih.gov/35144240/)
- Artificial Intelligence-Enabled Analysis of Public Attitudes on Facebook and Twitter Toward COVID-19 Vaccines in the United Kingdom and the United States: Observational Study (https://pubmed.ncbi.nlm.nih.gov/33724919/)