

Social dimension of COVID-19 pandemic in Poland on the Internet

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Social behavior has a fundamental impact on the dynamics of infectious diseases (such as COVID-19), challenging public health mitigation strategies and possibly the political consensus. The widespread use of the traditional and social media on the Internet provides us with an invaluable source of information on societal dynamics during pandemics. In the present study we aim to understand mechanisms of COVID-19 epidemic-related social behavior in Poland deploying methods of computational social science and digital epidemiology. We have collected and analyzed COVID-19 perception on the Polish language Internet during 15.01-30.06 using 51962 representative digital traditional media news (selected with EventRegistry tool) and 930319 tweets representing social media.

We constructed and analyzed two kinds of networks:

1) Temporal networks between words and topics (news and tweets). For instance, as the evolution of the interest on COVID-19 revealed, after the first confirmed case during the first weeks main topics related to Coronavirus were related to sports and the exchange market while medical issues were far behind. At the peak of interest around 12-13.03 the most popular topic was "closing schools" followed by "closing borders". We have found that declarations and not the actual enactment of mitigation strategies by the prime minister or the minister of health gathered the highest attention to the COVID-19 pandemic of the Internet users in Poland.

2) Temporal network of important actors (Twitter). The retweet network (with revealed community structure) shows how the discourse in social media represents the political scene divided into the ruling party and opposition. We observe how political polarization was evolving in time (with a short term consolidation process at the beginning of the pandemic due to an urgent need to fight the disease).

Our results indicate¹ that risk perception is unrelated to the actual physical risk of acquiring COVID-19 (with a statistically significant delayed anti-correlations), however it still has a significant effect on social dynamics in reaction to this unprecedented threat. Authorities need to listen to their publics and adapt accordingly, in real-time, thus our study would be a great supplement of ongoing longitudinal societal surveys.

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