

Appendix E:

Supplemental Material of Additional Topic Modeling Analyses Examples

Daily Topics Examples:

We wanted to also include some further examples of identified topics at the different time scales to illustrate the effectiveness of the X / Twitter Emerging Topic Modeling program. While we will not go into as much detail as the main examples, these cases display a wider range of topics that were investigated during the study periods. The first is an example of combining all the count of the topics generated by each language together, unlike the North Korean missile launches example we kept the languages separate. Like the North Korean missile launches, the Ukraine War was discussed in all seven languages especially since the study period happened to include the first anniversary of the beginning of the invasion.

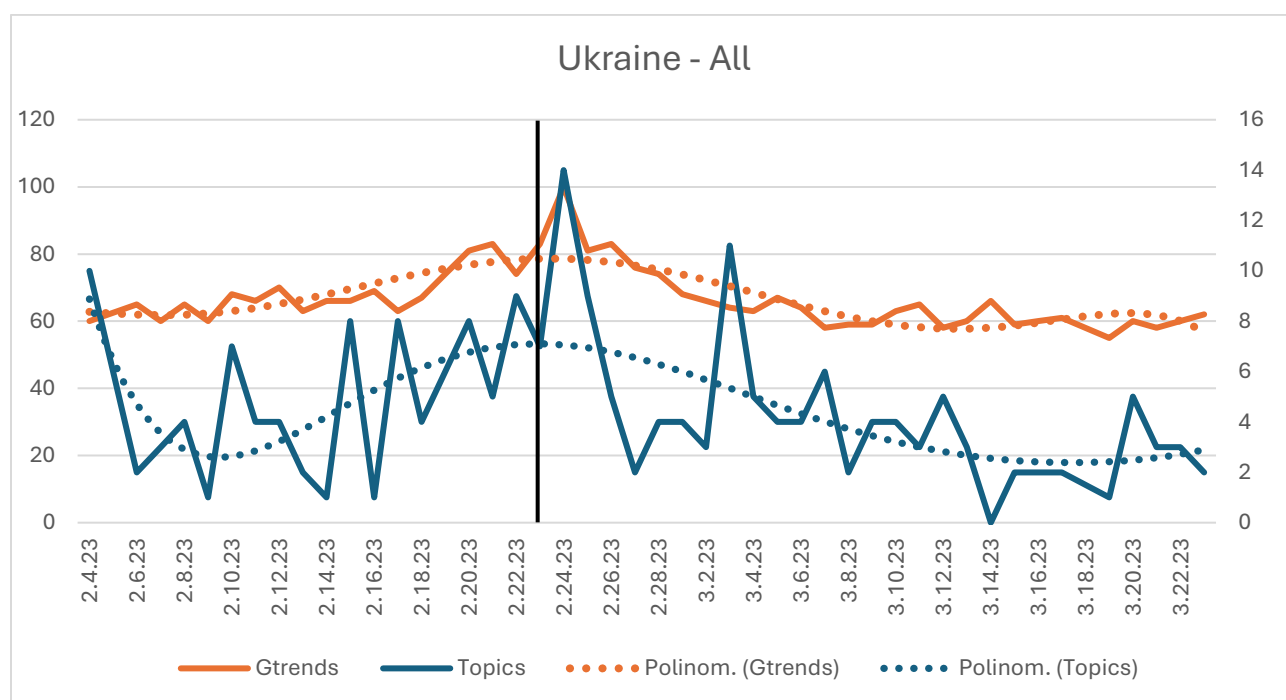


Figure E.1: Ukraine War - All Language topic model comparison

While the individual languages had different days and times for when the Ukraine War emerged as a topic, when put together, the overall X / Twitter trend (in blue) matches the Google Trends (in orange). Also, the combined language X / Twitter trend line spikes roughly on March 23rd, 2023 (the black line), which is slightly before the peak of the trend line of Google Trends, indicating that X / Twitter emerging topics trends occur faster than the emergence on Google Trends.

We also wanted to show a few individual daily topics for certain regions. Below are the trends for the South China Sea for English. This was the second most generated emerging topic in English, so it warrants study. The South China Sea has been a geopolitical hot spot for most of the last decade as China started to project more power over the region. This has created worries for the United States and its allies, especially Taiwan and the Philippines.

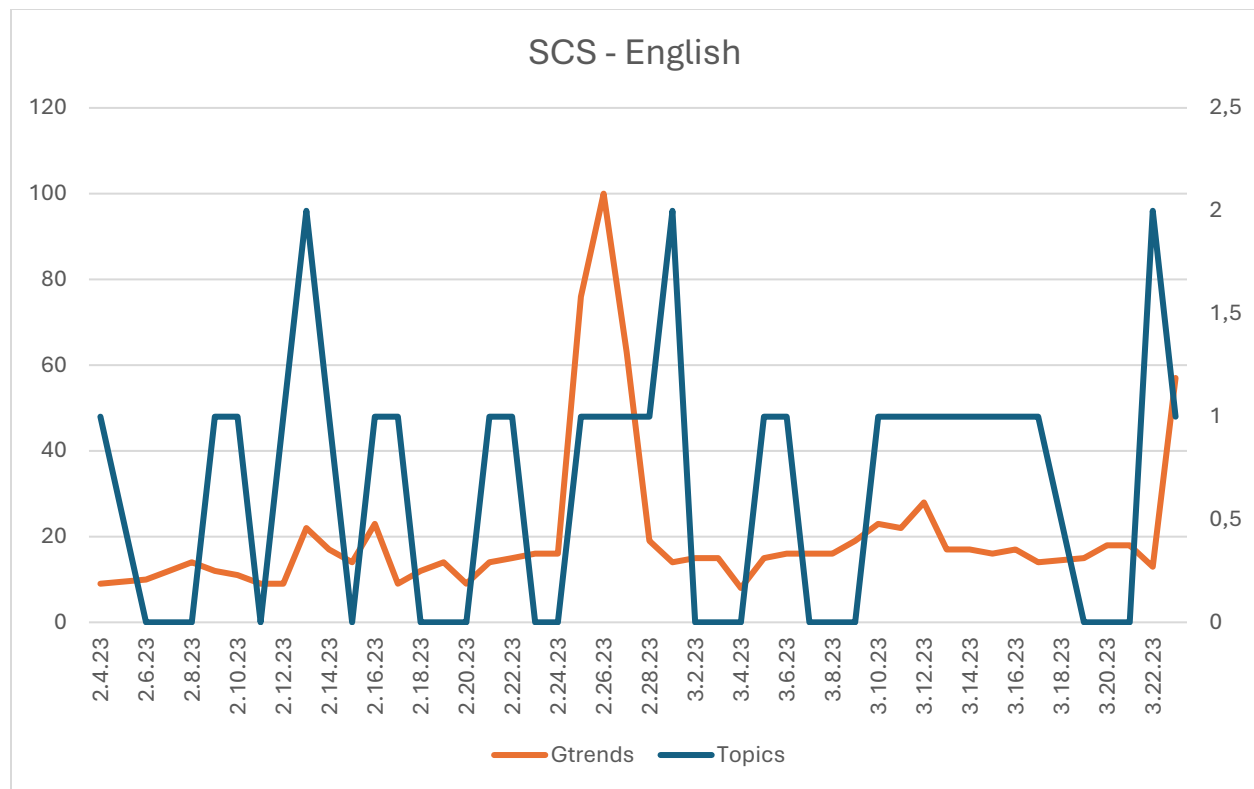


Figure E.2: South China Sea - English topic model comparison

As the chart above presents, there were three significant spikes in the X / Twitter Emerging topic model trend and two in the Google Trends. These spikes coincide with minor conflicts occurring in the South China Sea. The first spike was on February 13th, 2023, the Philippines accused a Chinese Coast Guard ship of harassing one of their Coast Guard ships (The Associated Press, 2023). This event created the emerging South China Sea X / Twitter topic for that date. It was the significant spike without a corresponding spike in the Google Trends data indicating that X / Twitter Emerging Topic programs can pick up more information than Google Trends alone. The second spike relates to February 26th, 2023, and seems to also relate to this incident, which was the highest spike for Google Trends, but there was a similar spike in the X / Twitter data. Finally, there was the report of the Chinese naval command warning off a US Navy ship in the South China Sea on March 23rd (Aljazeera, 2023). While this event caused a spike in both the X / Twitter trends and Google Trends, the X / Twitter spike occurred a day before the Google Trends, further illustrating my previous findings in Case Study 2.

Lastly, another major geopolitical risk discussed during this time was the Iranian Nuclear Program. While we discussed this issue in Chapter 5 for the Hourly results, which were in June of 2023, this is a major geopolitical worry for the Arabic-speaking world and emerged as a topic quite frequently in both the X / Twitter trends and Google Trends.

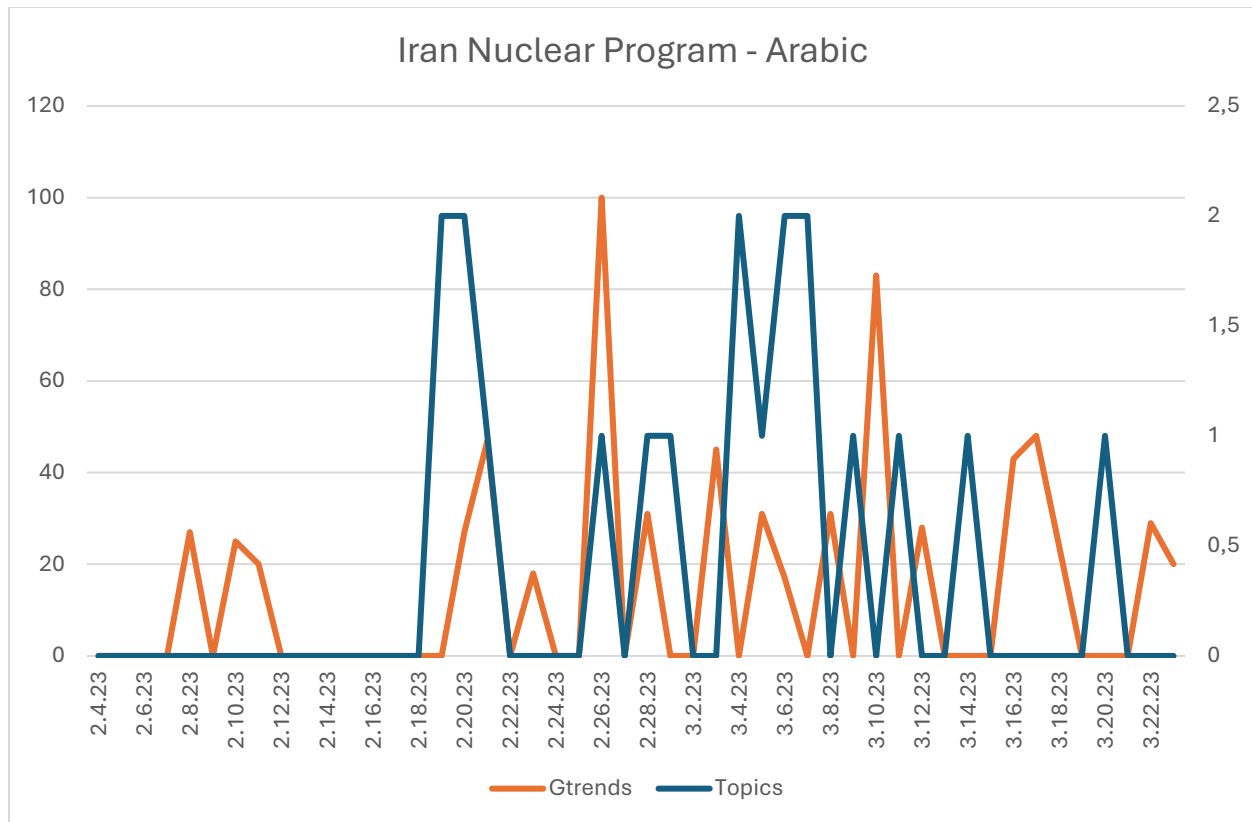


Figure E.3: Iran Nuclear Program - Arabic topic model comparison

Like the South China Sea, the emerging topics correspond to events surrounding the Iranian Nuclear Program. For example, on February 17th, Israel announced that "all possible means on the table" (Irish, 2023) to stop the Iranian Nuclear Program, which caused multiple topics to emerge through the X / Twitter trends program, while a corresponding spike was seen on Google Trends a few days later. A contemporaneous spike in both X / Twitter trends and Google Trends on February 26th relating to the CIA director discussing the worries of the growth of the Iranian Nuclear program (Barkoff, 2023). Lastly, the small spikes around March 8th - March 12th are related to the US Treasury Department's sanctions on Iran's UAV program and its collaboration with China (TREASURY, 2023).

These additional three examples show that the X / Twitter Emerging Topic model program works in discovering emerging topics either quicker or at the same time as Google Trends and potentially more emerging instances than Google Trends, which makes the X / Twitter program an effective tool in monitoring geopolitical risk.

Hourly Topics Examples:

In addition to the Daily Topic examples, we wanted to include a few further examples of the hourly emerging topics, displaying that on specific topics that the X / Twitter trends spike a few hours before they appear through Google Trends.

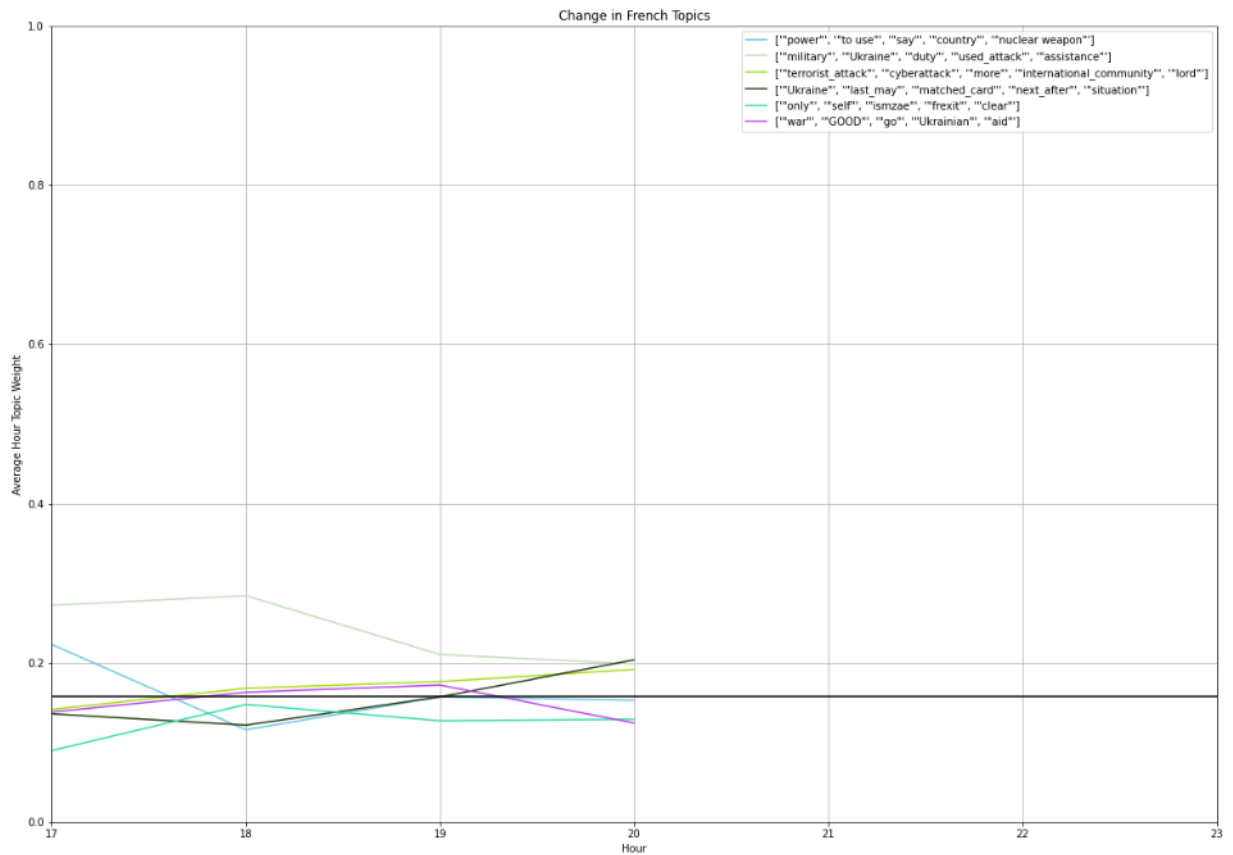


Figure E.4: French X / Twitter Emerging Topics for June 1st, 2023

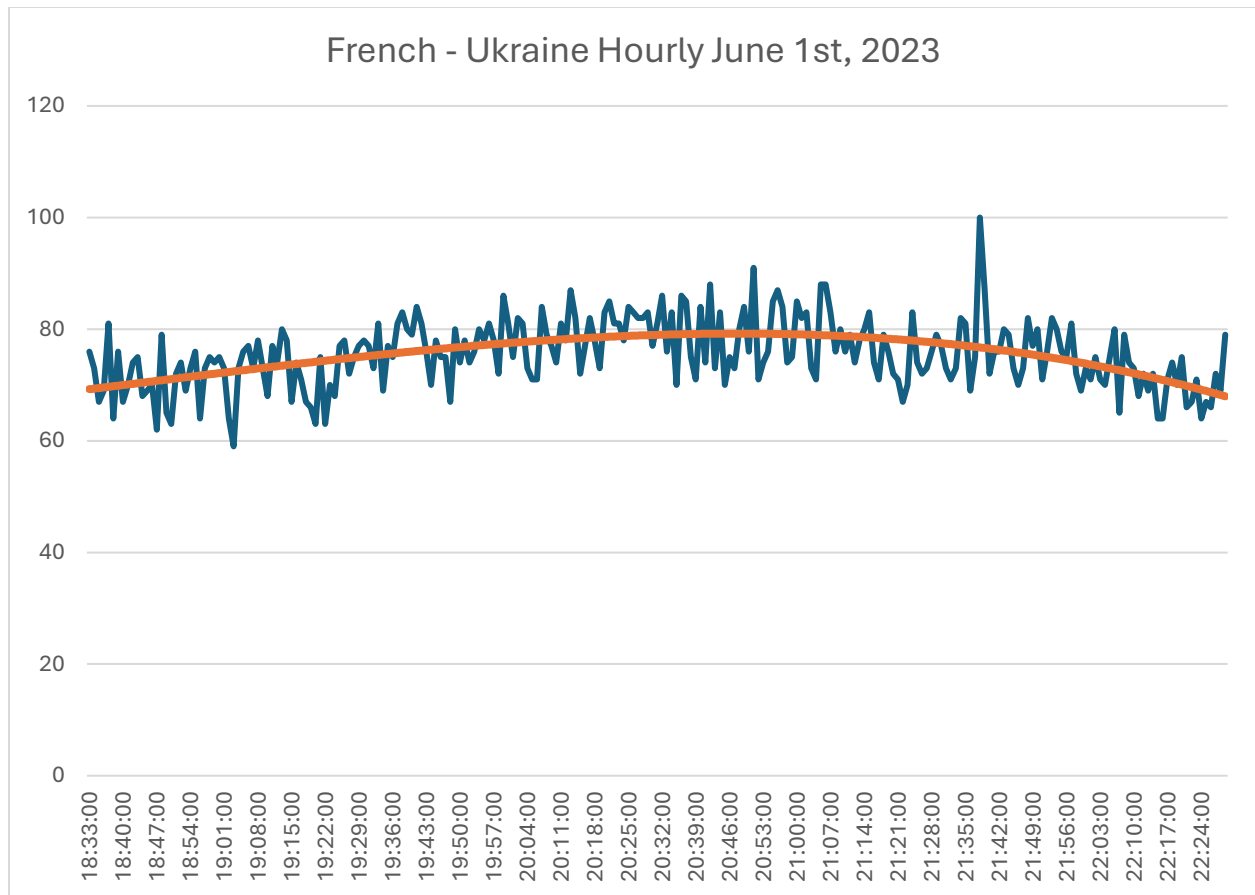


Figure E.5: Ukraine - French Google Trends for June 1st, 2023

Like the other examples, Ukraine as a topic in French X / Twitter program emerged and spiked as a topic roughly three hours before the topic spikes on Google Trends, as indicated by the orange trend line in Figure D.5, with the most search volume occurring for this period roughly four hours after Ukraine had peaked as an emerging topic on X / Twitter.

Another hourly example is the Portuguese X / Twitter program emerging topics on Russian Nuclear fear.

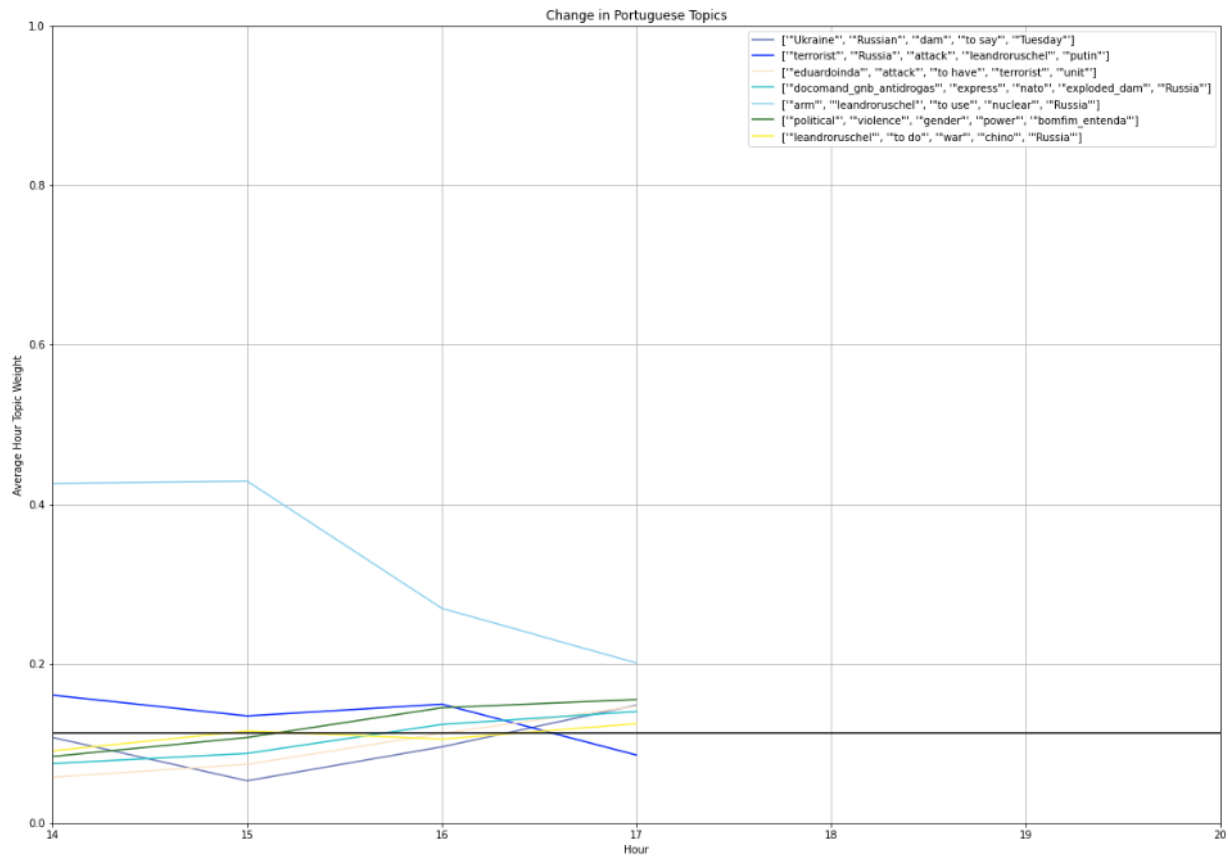


Figure E.6: Portuguese X / Twitter Emerging Topics for June 6th, 2023

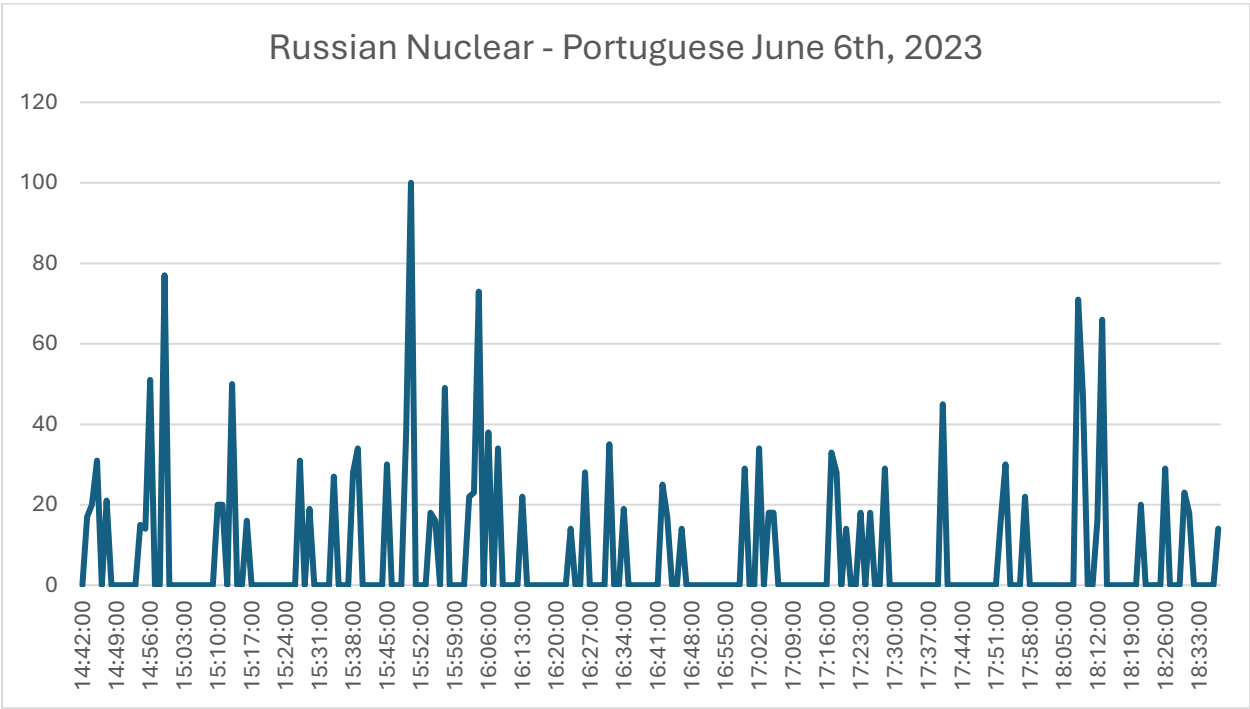


Figure E.7: Russian Nuclear - Portuguese Google Trends for June 1st, 2023

The spike in search volume is closer to the spike in the emerging topic of Russia Nuclear on the Portuguese X / Twitter program, however, the topic has seemed to have emerged before the collection period, which would explain the closer time difference than the average. Nevertheless, the X / Twitter program still spiked before the Google Trends search volume. This topic seems to have been generated by Russia claiming that U.S F-16s could be equipped with nuclear weapons if they are sent to Ukraine (Reuters, 2023).

References:

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