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THE USE OF GEO-TARGETING DURING ELECTIONS

PREPARED BY THE
NATO STRATEGIC COMMUNICATIONS
CENTRE OF EXCELLENCE



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Introduction

” Geo-targeting is a common tool for targeting information to a specific geographical area and is widely used in digital marketing, which uses geolocation, in combination with information gleaned from available user data about consumer preferences, to deliver location-specific content. It is a cost-effective way to match information with consumers.

We set out to examine geo-targeting of information in the context of the 2019 Finnish parliamentary and Indonesian presidential elections. Finland and Indonesia are socioeconomically very different and their internet penetration and adaptation of technology also vary significantly. However, both faced an important election, thus, are good targets for analysis.

Internet users around the globe demand different information and experiences that correspond to their geography. The most immediate difference is language: people want news, entertainment and services in their own language. Other things that vary by geography are culture, currency, climate and consumer norms.¹ Geo-targeting is a common tool for targeting information to a specific geographical area and is widely used in digital marketing, in combination with information gleaned from available user data about consumer preferences, to deliver location-specific content. It is a cost-effective way to match information with consumers.

The majority of services online, including social networking, photo and video-sharing platforms, allow the display and targeting of advertisements based on users location, among many other criteria. Additionally, search engine algorithms display a different rank of sources based on the users' location. This is one reason why two users who enter the same search terms into the same search engine but are in different locations will receive different results. Geo-targeting differs from censorship in the digital environment because sources are not made unavailable. Rather, selected sources are suggested to users, featured higher on search rankings or displayed in ad spaces on websites. It is a legitimate and effective method of online marketing. However, it can be misused to disrupt or influence the information space, public discussions or even democratic processes.

In the wake of the 2016 US Presidential election, it was discovered that the Internet Research Agency, a Russian company engaged in influence campaigns, used geo-targeting in conjunction with other parameters, such as interest, to promote groups, pages and events. Similarly, Cambridge Analytica, a British political consulting firm, used geo-targeting, coupled with their developed psychographics, to target voters in swing states ahead of the US presidential election.

One of the challenges faced by governments is to understand when and whether a potentially harmful information campaign is targeting its citizens. The ability to recognise hostile information targeted towards people inside the geographical boundaries of a certain country or area could be one way of tackling this problem. The three main challenges with achieving this, are the lack of robust methods for capturing content displayed to people in a particular location, classifying it as hostile or non-hostile and inferring targeting based on location. Content targeting determines, at least partially, the success of online platforms. However, platforms rarely disclose their mechanisms for targeting.

This report examines information related to elections presented in certain geographical locations across four platforms (Google, YouTube, Instagram and Facebook), and aims to unveil any targeted content. Further analysis of the information and sources presented is done using qualitative and quantitative means. The following section introduces the case studies of the 2019 Finnish



parliamentary election and Indonesian presidential election, as well as the methodology used to collect data and obtain results. The third section describes the results we obtained for both countries on each platform. Conclusions and recommendations are presented in the final section.



Timeline of 2019 Presidential Elections in Indonesia

April 2019

Indonesia's election commission orders an investigation into reports of overseas voter fraud after videos circulated online feature thousands of ballots that had been marked in favour of Widodo days before the elections took place.

19 April 2019

Indonesia holds a general election. For the first time presidential, parliamentary and regional elections all take place on the same day. Around 192 million people cast their vote in an election involving 245,000 candidates running for more than 20,000 national and local legislative seats.

May 2019

Accusations of corruption and fraud culminate in protests and riots fuelled by disinformation.

21 May 2019

The election commission announces Joko Widodo has secured his re-election as Indonesia's president with 55.5% of the vote. Prabowo rejects this result, alleging that 'widespread cheating' had taken place to ensure his defeat.

The official declaration of Joko Widodo's victory triggers protests by opposition supporters.

23 May 2019

During protests, eight civilians die and hundreds are injured. The violent protests are motivated by false information about the election spread through social media platforms, particularly WhatsApp.

June 2019

Indonesia's Constitutional Court rejects Prabowo's claim that he was the victim of systematic election fraud, citing lack of evidence.



2019 Presidential Elections in Indonesia

With a population of 264 million, Indonesia is the 4th most populous country in the world. It is ethnically and religiously very diverse, consisting of 1,300 ethnic groups and containing the largest Muslim population in the world. Indonesians are avid social media and smartphone users with an increasing number of internet users every year. In 2018, 64.8 percent of the total population were already connected to the internet, an increase by 10 percent from the previous year. According to We Are Social, the top visited websites in Indonesia were Google, YouTube and Facebook, and the most used social media platforms were YouTube, Facebook and Instagram.

Despite its image as a country with a tolerant and moderate Muslim population, Indonesia's voters are still influenced by religious and ethnic sentiments. Over the past few years, 'fake news' has been on the rise in Indonesia and increasingly occurs during important elections, along with the fear that deliberate misinformation could be leveraged to exploit the country's religious and ethnic fault lines in favour of one party or another.

Indonesia held a general election on 17 April 2019, marking the first time presidential, parliamentary and regional elections all took place on the same day. However, the presiden-

tial contest was the main focus of the Indonesian electorate. Incumbent president Joko Widodo faced opposition candidate Prabowo Subianto, a former military general.

The central issue of this election was Indonesia's national identity and whether it should adopt an increasingly Islamic political course. Joko, a religious moderate, chose Ma'ruf Amin, a powerful Muslim cleric, as his running mate to attract the votes of conservative Muslims. Prabowo, who was endorsed by the country's largest Islamist party, promised to protect Islamic leaders and to increase funding for religious schools.²

On 21 May, the official declaration of Joko Widodo's victory triggered protests by opposition supporters, leaving eight civilians dead and hundreds injured by the close of 23 May. The violent protests were motivated by false information about the election spread through social media platforms, particularly WhatsApp.³ However, in June, Indonesia's Constitutional Court rejected Prabowo's claim that he was the victim of systematic election fraud, citing a lack of evidence to support his accusation.⁴



Timeline of 2019 Finnish Parliamentary Elections

2015

Finland is governed by a three-party coalition formed by the Centre Party, the right-wing populist Finns Party and the centre-right National Coalition Party.

June 2017

The coalition is thrown into turmoil when the populist Finns Party elected the controversial Jussi Halla-aho as its new chief. Finland's prime minister at the time, Juha Sipilä, refuses to govern with the Finns Party if Halla-aho remains. To salvage the coalition, 20 members of the Finns Party defect and form Blue Reform, replacing the Finns Party in the governing coalition.

2019

March 2019

PM and the entire government resign after failing to pass major healthcare and welfare reforms.⁶

14 April 2019

The Finnish parliamentary elections take place. For the first time in 20 years, the Social Democrats place first in the election by a narrow margin with 17.7 percent of the vote. They are closely followed by the far-right, anti-immigrant Finns Party, which won 17.5 percent of the vote. The two parties disagree on issues of immigration, the EU, and economic policy.

June 2019

Refusing to include the Finns Party in the new government, the Social Democrats form a left-right coalition government under Antti Rinne, bringing together the Centre Party, the Green League, the Left Alliance and the Swedish People's Party.⁷



2019 Presidential Elections in Finland

Finland is one of the most sparsely populated countries in Europe, with only 5.5 million people inhabiting an area almost the size of Germany, which has a population of 83 million. It is ethnically homogenous with a small minority of the Sami people and a small, but growing, percentage of persons with a foreign background (7.3%). According to the OECD Better Life Index, Finland ranks high in several measures of well-being such as education, skills and subjective well-being, and above average for other dimensions, such as income and wealth, jobs and earnings, environmental quality, personal security, housing and work-life balance.⁵

In terms of Internet penetration, 94 percent of the population are connected to the Internet and 58 percent are active social media users. Google, YouTube and Facebook were the most visited websites in 2018, and, according to We Are Social, YouTube, Facebook and Instagram were the top social media sites. Finland ranked first out of 35 countries in a study that examined resilience in the face of the post-truth phenomenon, i.e. 'fake news'. Given their demographic, socioeconomic and internet penetration differences, both Indonesia and Finland provide an interesting basis for comparison.



Helsinki, Finland. 14 April 2019: The 2019 Finnish parliamentary election is held on 14 April 2019.





Methodology



We chose to examine election-related information on Google, YouTube, Instagram and Facebook. These platforms, apart from being popular in Indonesia and Finland, are diverse in their structure and usage, and very popular throughout the world. Google is the world's most popular search engine among all ages, handling nearly 90% of global internet search activity. Every year, this translates to trillions of queries related to people's private thoughts, concerns and questions. Google's search engine is a source for news, fact checking and, as some studies suggest, influences voters' opinions through the search engine ranking system (SEME effect). Google's search engine has become an information authority that often defines the important, less important, private, and public terms of online information.⁸

Facebook, on the other hand, is the world's most popular social media platform. Its wide variety of online features lends it to many different use cases. Individuals use it to keep in touch with family and friends, to share photos, videos, opinions, and a growing portion of people use Facebook to stay up-to-date with news and current events. However, there is a steady decline of Facebook use among younger demographics.

The two fastest growing platforms among teens are YouTube and Instagram, both of which are visual-based. YouTube is a video-sharing platform; the second most popular social media platform with 1.9 billion users. Instagram is a photo-sharing plat-

form, the sixth most popular social media platform worldwide with 1 billion active users. Though YouTube is increasingly popular among young adults, it is used by people of all ages, whereas Instagram is predominantly used by younger generations (the average age of an Instagram user is 18).

The table below describes the types of content we found and differentiated between on Google, YouTube, Facebook and Instagram. Note that this table is not a complete guide to all the content available on said platforms, and not all content mentioned in this table was collected.

In the table below and in our data collection we separate advertisements from other content types. In practise, advertisements on many platforms appear like and among organic content (Google, Facebook and Instagram). For the purpose of more granular analysis, we also differentiated between content that contains images and/or video and content that does not. In practise, some platforms such as Instagram and YouTube contain only images and videos.



	Google	YouTube
Ads	Articles or webpages that have been paid for, and appear above organic results.	YouTube has several video ad formats of which we collected only video discovery ads: included as part of YouTube search results, alongside YouTube related videos.
Top stories	Articles featured in Google's Top Story box, mostly populated with trusted sources, and present for popular searches only.	Not applicable.
Knowledge panel	Public domain information that provides quick answers, and appears above every other kind of search result. Usually doesn't link to external websites.	Not applicable.
Images	Images as Google search results show up only if people have searched for specific images.	Not applicable.
Videos	Videos as Google search results show up only if people have searched for specific videos.	All YouTube results are videos.
Channel recommendations	Not applicable.	Channels and videos from channels user hasn't seen before based on what other viewers with similar interests have liked and watched in the past. ⁹
Channel suggestions	Not applicable.	Channels and videos from channels user hasn't seen before based on what other viewers with similar interests have liked and watched in the past. ¹⁰
Organic results	Wide variety of content that appears on Google search results and is not paid for, do not feature in top stories or knowledge panels. Earned by the best content, most traffic etc.	Videos that have kept the biggest number of people engaged for the longest period of time.



	Facebook	Instagram
Ads	Content that has been paid for and shows up on people's Facebook feeds or stories, but not in search results.	Content that has been paid for and shows up on people's Instagram feeds or stories, but not in search results.
Top stories	Not applicable.	Not applicable.
Knowledge panel	Not applicable.	Not applicable.
Images	Facebook posts which feature images.	Instagram posts which feature images.
Videos	Facebook posts which feature videos.	Instagram posts which feature videos.
Channel recommendations	Not applicable.	Not applicable.
Channel suggestions	Not applicable.	Not applicable.
Organic results	Appear on users Facebook feed or in search results. Influenced by profiles own activity and general Facebook community activity, including the popularity of whatever people are searching for and how recently it was posted.	Appear on users Instagram feed or in search results. Influenced by a variety of factors including profiles own activity.

Inferring targeting

The core problem of this study was to infer what content was being targeted to certain audiences in selected areas. As the internal mechanisms of Google, YouTube, Facebook and Instagram are still unknown to the public, we assumed that content that is targeted to a certain area would have 2 out of 3 characteristics:

- Visible in search results in one area, but not other areas (as shown in Figure 1);
- Advertised to appear higher in search results for a group of people or people in a certain area;
- Popular or trending to appear higher in search results for a group of people or people in a certain area.

To evaluate online content for the above characteristics, we followed a two-step process. The first step was to ensure that devices from which data is collected appear to be in certain locations. This was achieved using VirtualBoxes with adjusted time, language and region settings to Indonesia and Finland while using VPN with set whitelisted private IP addresses located in different regions in Indonesia and Finland.

From a browser opened in said VirtualBox, an election-related keyword was searched on Google, YouTube, Facebook and Instagram. The top 10 search results were recorded, browser

history and cookies were cleared and a new browser session was started. Data was collected from various such “locations” and compared for discrepancies, i.e., differences in articles, images, posts and sources that appear in the results. Any differences in information presented were examined further.

The second step was to seek out promoted content, i.e., content that has been paid for, and popular content. Both types of content are consistently ranked higher on user feeds and search results, and thus brought to people’s attention. This can be an indicator of targeted content.

Data Collection

From 25 March to 17 April we used Google, YouTube, Facebook and Instagram to search a number of election-related keywords in Bahasa and Finnish. There are many moving variables that influence why people see what they see when searching said platforms, and geographical area is only one of them.

For Google we recorded the top 10 search results promoted content, knowledge panels, top stories, top images and videos separately. For YouTube we also recorded the top 10 search results channel suggestions and recommended channels separately. IP address availability affected which states we surveyed for election-related results. For Instagram and Facebook we registered new accounts with Indonesian and Finnish SIM cards, set the self-declared location in Indonesia and Finland and used a VPN



to search for keywords and record results. During our data collection period, however, several accounts were suspended and it affected which states we could survey for election-related results on Facebook and Instagram.

Framework

In the following analysis, we sought to identify whether the patterns suggested by our hypotheses are corroborated by the available data. At this point, we only aim to confirm whether geo-targeting methods were used when displaying election-related information during critical election periods in both Indonesia and Finland.

To this end, we analysed the top election-related search results on Facebook, Instagram, YouTube and Google across several regions in both countries to identify whether any results meet our selection criteria for geo-targeted content. The results of this section will inform our selection of top posts for further qualitative analysis. This part of the analysis identifies regional trends, similarities and differences between Finland and Indonesia. It uses a quantitative methodology to indicate possible cases of geo targeting and to inform case selection.

To test the first of the previously outlined conditions, we identified, for each region and each platform, the posts that appear only in that region. We refer to these posts as **single-region posts**. In the case of Google, we were also able to distinguish between

paid-for ads and regular content, enabling us to test the second condition. To measure the third condition, we identified the most frequently occurring posts in each region across platforms. We used this as a measure for trending content. These posts are referred to as **top posts**.

Due to the variation in frequency among regions, we set a low threshold and consider posts that occurred at least twice in each dataset a top post. Altogether this enabled us to identify posts that we consider geo-targeted posts, namely all those that are simultaneously single-region posts and top posts or single-region posts and ads. **Unique posts** refer to the total number of individual posts in each region, excluding duplicates.





Indonesia

Table 1 below provides an overview of the results from Facebook, Instagram, YouTube and Google in Indonesia. Facebook received the highest rate of single-region posts, followed by Google. Across Instagram and YouTube, the share of single-region posts was much lower. This sizeable discrepancy indicates that platforms Facebook and Google feature more regionally diverse content. However, the shares of single-region posts that were also top posts, i.e. those that appeared in the dataset twice or more, were low and relatively stable across the four platforms. In other words: posts that we consider to be geo-targeted were very few and platforms do not differ greatly in terms of the frequency with which geo-targeting methods were used. Over the next sections we will examine the results of each platform in greater detail.

Platform	Total unique posts	Share of single-region posts	Share of single-region top posts
Facebook	170	78.8%	4.5%
Instagram	165	10.3%	5.9%
YouTube	216	19.4%	7.1%
Google	274	37.2%	3.6%

Table 1: Indonesia results overview by social media platform

Facebook

On Facebook, we gathered 170 unique posts from seven regions: West Java, North Sumatra, Banten, South Sulawesi, East Java, Central Java and Jakarta. The results are presented in Table 2 below.

Region	Total unique posts	Share of single-region posts	Share of single-region top posts
West Java	46	53.3 %	8.3 %
North Sumatra	27	37 %	0 %
Banten	29	42.9 %	0 %
South Sulawesi	31	43.3 %	0 %
East Java	51	58 %	6.9 %
Central Java	56	60 %	6.1 %
Jakarta	33	40.6 %	0 %

Table 2: Indonesia Facebook results



As Table 2 illustrates, content on Facebook in Indonesia is very regionally diverse. All monitored regions in Indonesia displayed high percentages of single-region posts on Facebook, with the lowest portion being 37%. Three regions stand out in particular: more than half of the unique posts in Central Java, East Java and West Java appeared in their respective region and no other. These three regions were also identified as the only regions with posts that we would consider geo-targeted content: single-region posts that qualified as top posts. This finding may be attributed to the fact that Central Java, East Java and West Java are the most populous regions in the country and, therefore, more relevant electorates.¹¹

The five top trending posts that we retrieved across all regions consisted of general information and news about the presidential election in Indonesia. For instance, the first post featured a photo with advice about the proper voting procedure, posted in a public group that supported the opposition candidates, Prabowo Subianto and his running mate Sandiaga Uno. This post received 197 total interactions in the group of 53,884 members.

The second post linked to an article on CNN Indonesia about alleged voter fraud after videos circulated online of thousands of voter ballots marked in favour of sitting Indonesian president Joko Widodo throughout a warehouse in Malaysia.¹² The ballots were meant for the many Indonesian citizens who live and work in Malaysia.¹³

This seemed to be a popular article, recording close to 30,000 total interactions on Facebook.

The third post was published by Facebook on Facebook Indonesia, announcing a new feature titled “Candidate Info” on which individuals can inform themselves about the election candidates. The fourth post, a clip from a televised vice-presidential debate, was posted in a group about the debate and received 24 total interactions. The fifth post was shared on a verified page that boasts 470,895 followers and claims that it “always strives to gather and channel news that are accurate, fast, fair & balanced.”¹⁴



A geo-targeted post on CNN Indonesia FB page

As outlined in the results, we identified six geo-targeted posts on Facebook which appeared in West Java, East Java and Central Java. Two top posts were identified in West Java; these were either not relevant to the elections or no longer available. In contrast with West Java, the two top posts in East Java



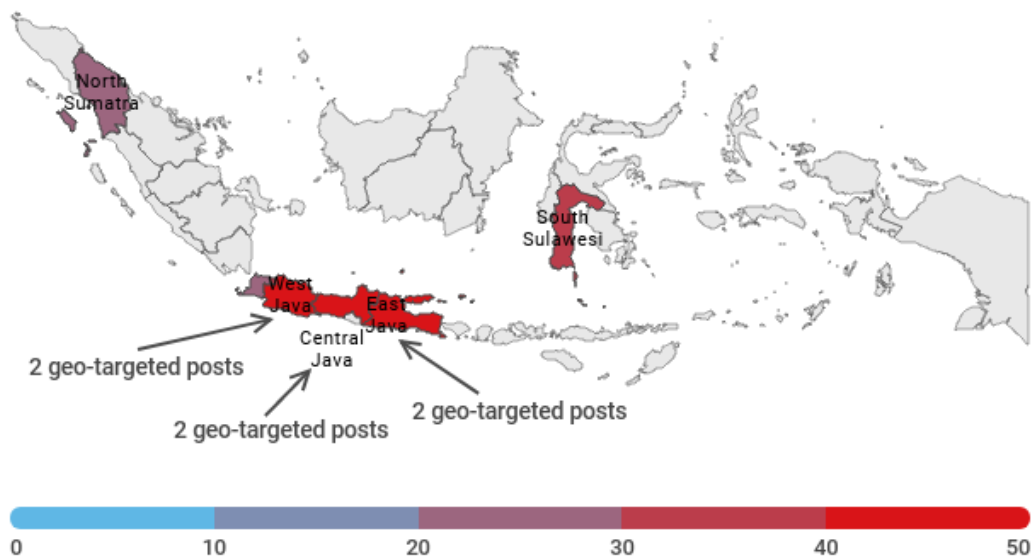


Figure 1: Map of Indonesia and regions covered when collecting Facebook search results

had clear political indications.

The first was a post about the ballot scandal in Malaysia that has since been removed from Facebook. Before it was taken down, the article had 33 likes. The second post featured an article announcing the politicisation of Nahdlatul Ulama (NU), a Sunni religious organisation. This post received only two interactions.

Finally, two geo-targeted posts were identified in Central Java. The first linked to a mainstream media advertisement to stream an upcoming debate on the MNCTV channel's official page.¹⁵ This post received 670 total interactions. The second was another CNN Indonesia article about the ballot scandal in Malaysia, about Indonesia's Election Commission's intention to launch an investigation into the fraud allegations. This article received 9,422 interactions on Facebook. What distinguishes a few of these posts from the pan-re-

gion trending posts is their low interaction rate, indicating that their trending nature, i.e. recurrence in the dataset, is derived from a factor other than likes or shares.

Instagram

On Instagram, we gathered 165 unique posts from eight regions: West Java, North Sumatra, Banten, South Sulawesi, East Java, Central Java, Jakarta and Yogyakarta. Contrary to Facebook, Instagram data yielded low levels of regional variation and virtually no geo-targeting. In fact, Instagram results had the lowest share of single-region posts of the four monitored social media platforms (10.3%). We observed single-region posts in only five of the eight regions. The highest shares of single-region posts were in West Java (5.2%) and Banten (4.1%). The results from South Sulawesi, East Java and Yogyakarta did not



contain any single-region posts. And of the 17 single-region posts that we identified, only one in West Java was a top post and therefore a post that we consider targeted to that particular geography.

On Instagram, the top five trending posts contained messages supporting the incumbent and opposition political parties. The most frequently appearing post featured a photo of a community welcoming Prabowo Subianto's campaign, stating that his administration will foster a just and prosperous Indonesia (see figure 4 below). This post, which received 3,100 likes, was posted on *relawanpride*, a pro-Prabowo account with 16.3k followers. The account claims to be the Digital Team of Prabowo Sandi, the team name for Prabowo and his running mate.¹⁶

The second post was published on the same pro-Prabowo account, stating that support for Prabowo's campaign from various communities and national figures continues to grow. This post received 5,878 likes.

While the first two posts were published in support of Prabowo, another top post features an image of Ma'ruf Amin, incumbent president Joko Widodo's running mate, with a quote in which he expresses optimism that they will win the presidential election in West Sumatra. The photo received 118 likes and was published on a page with 16.8k followers. Of the two remaining posts, one was no longer available while the other did not feature election-related content.



Cross-region top post, pro-Prabowo





Geotargeted post, pro-Perindo

While we identified only one geo-targeted post on Instagram, the nature of this post suggests it was deliberately targeted at the region in question, West Java. The photo, pictured in figure 5 above, includes a graphic that displays Perindo, a right-wing political party, as the third most popular party in Indonesia, behind Joko Widodo's PDIP (Indonesian Democratic Party of Struggle) and Prabowo's Gerindra (Great Indonesian Movement Party). The image received 1,755 likes and was posted on Perindo's verified Instagram page, which has 419k followers. Perindo may have targeted the audience in West Java to promote their party platform because the region is ranked among the most conservative in Indonesia.¹⁷

YouTube

Echoing Instagram, the results on YouTube demonstrated low levels of regional variation and close to no geo-targeting. We gathered data from 22 regions, compiling 216 unique videos, 42 of which were identified as single-region videos. 13 of the 22 regions retrieved single-region videos, including West Java (9), East Java (8) and Jakarta (7). These three regions displayed the highest counts of single-region videos. Three single-region top posts were identified in West Java, suggesting that they were targeted to that region.

Similar to Facebook, the most frequently occurring videos in the YouTube dataset contained generally neutral, informative content. The top recurring videos included two videos published



by artefaXmedia, a channel with 100,823 subscribers. The first video, which explains how to vote accordingly, was viewed 1,638,710 times and received 17k likes. The second, an election guide, received 191,652 views and 1.7k likes. The third and fourth videos were posted on different channels and are similar to atefaXmedia's content, featuring an instructional guide for the voting process and an overview of the 14 political parties that registered to participate in elections. The final video is a stream of the full presidential debate by mainstream media MNCTV and received 268,477 views.

Of the three geo-targeted videos we identified in West Java, only one has not been removed. The footage claims to be of the warehouse in Malaysia where voter ballots were found marked in

favour of Joko Widodo, the winning candidate. The video received 4,996 views. This original footage may be among the videos that were widely circulated and sparked an investigation into the overseas electoral process.

Google

On Google, we gathered 374 unique search results and 23 unique ads from 21 regions. The results from Google were subsequently analysed for possible geo-targeting using a two-pronged approach. First, we identified the single-region posts and single-region top posts within the dataset. Second, we identified all unique ads and ads occurring exclusively in a single region. Of the 21 regions monitored, four did not feature

Region	Number of unique posts per region	Share of single-region posts	Share of single-region top posts
West Java	165	13.3 %	13.6 %
North Sumatra	65	9.2 %	0 %
West Kalimantan	89	11.2 %	0 %
South Sumatra	16	12.5 %	0 %
East Java	180	16.7 %	3.3 %
Central Java	119	5 %	0 %
Jakarta	160	10.6 %	0 %
Yogyakarta	48	25 %	0 %
Riau Island	59	6.8 %	25 %

Table 3: Indonesia Google results



Region	Number of unique ads	Share of single-region ads	Share of single-region ads
West Java	7	1	14.3 %
North Sumatra	5	1	20 %
West Kalimantan	5	1	20 %
South Sumatra	5	2	40 %
East Java	11	6	54.6 %
Central Java	1	1	100 %
Jakarta	6	3	50 %
Yogyakarta	6	1	16.7 %

Table 4: Indonesia Google results, ads

any single-region posts or ads in their results. We excluded these from Tables 3 and 4 as they featured no content that would be of interest to the research question at hand.

The highest shares of single-region posts occurred in Yogyakarta (25%), East Java (16.7%) and West Java (13.3%). However, the higher portion of single-region posts in Yogyakarta may be attributable to the fact that only 48 unique posts were collected from the region, while East and West Java boasts over 150 unique posts each. East and West Java, along with Riau Islands, were also the only regions where we found single-region top posts, i.e. geo-targeted posts. There were 5 such posts in total, which we will analyse further below.

While our search results contained relatively few unique ads (23), this type of content is clearly used to target specific regions. Close

to 70% of all ads appeared only in one region and no other. Of the 8 regions with single-region ads, East Java received the highest quantity (6). However, Central Java had the highest share of single-region ads because only one ad was identified in the region. It is noteworthy that East Java and West Java had both single-region top posts and single-region ads, meeting both of our conditions for geo-targeting. This makes these regions the most interesting geography for further analysis.

Our qualitative analysis of the content of top trending and geo-targeted posts resulted in several findings. We noted that most trending content accessible to audiences in various regions contained general educational information about the presidential elections. In contrast, much of the geo-targeted



content we identified centred around a politically damaging news story: alleged voter ballot fraud in Malaysia, which we will expand upon in greater detail below. Levels of engagement varied between top trending content across all regions and content targeted at a specific region, with some geo-targeted posts receiving low interaction rates and some appearing to be organically popular. The most significant findings we identified were on Facebook and Google, where organic and paid-for geo-targeted content seemed to fulfil clear political aims. This in itself only shows that political parties are using effective marketing methods to reach their target audiences. However, for sensitive topics and crucial times such as election campaigning, it is important to examine further the information for inflammatory, divisive or hostile content.

The top trending search results that we retrieved from Google across all regions were informative of both elections in general and of the election process in Indonesia. Three search

results were Wikipedia pages, containing politically neutral information about political parties in general, which political parties exist in Indonesia, and how the Indonesian electoral process works. One search result popular among all regions was the political tab of Sindownews.com, a content aggregator. Interestingly, the English language version of the website shares articles exclusively from Deutsche Welle, Germany’s public international broadcaster, and Sputnik International, a Russian state-owned media outlet.

In contrast with the trending cross-region search results, the geo-targeted search results focused exclusively on the ballot scandal in Malaysia. We identified six geo-targeted results: three in West Java, one in East Java, and one in Riau Islands. One of West Java’s three results was irrelevant to the elections; however, the other two featured articles and a video about the ballot papers uncovered in Malaysia. According to CrowdTangle, a social media listening tool, the article in West Java – which

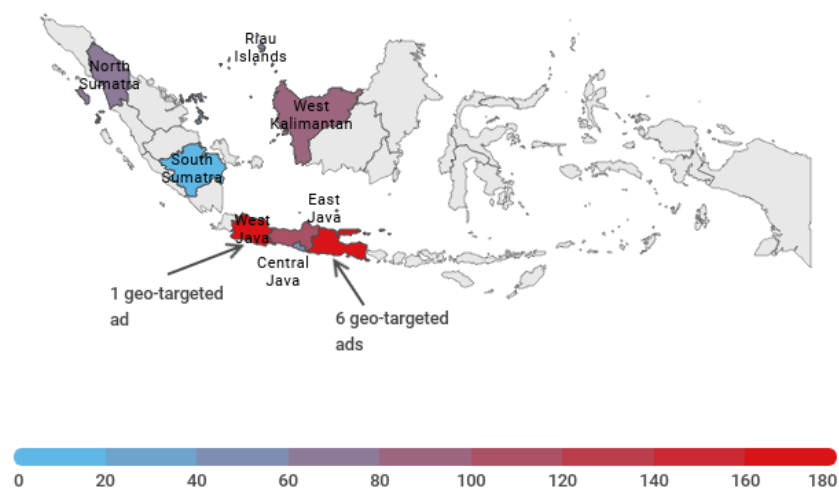


Figure 2: Map of Indonesia and regions covered when collecting Google search results



contained the viral video of pre-marked ballots – received 15,202 total interactions on Facebook. The article about Malaysia that arose in Riau Islands, a region we had not yet seen targeted, received 65,539 total interactions on both public and private Facebook posts and 747 interactions on Twitter. However, the search result identified in East Java contains a contradictory message, asserting that overseas election procedures are legitimate. Notably, this article received only 118 interactions on Facebook and 7 on Twitter. This begs the question why this search result was trending in East Java. One possible explanation is that the author of this article designed it with the express purpose of increasing confidence in the election process in this particular segment of the voter population amid an institutional scandal.

Turning to paid-for content on Google, we identified 23 unique ads across all regions. Two of the top trending ads promoted articles about the two least popular political parties in Indonesia, suggesting that the parties attempted to garner greater support throughout the general population before election-day. Additionally, we identified two ads aimed at boosting the perception of electoral transparency in the midst of the Malaysian ballot scandal: one article was about the Electoral Commission's pledge to hold open elections attended by several ambassadors, while the other announced the Electoral Commission's release of a list of corrupt former candidates, encouraging constituents to vote for upstanding officials.

We identified geo-targeted ads in West Java (1), North Sumatra (1), West Kalimantan (1), South Sumatra (2), East Java (6), Central Java (1), Jakarta (3) and Yogyakarta (1). All the identified geo-targeted ads were guiding users to the local election commission webpages of each respective region. The content of these webpages is entirely informative in nature. In contrast with our expectations, the generalised Google ads served a political purpose, while the single-region ads provided users with general procedural information.



Finland



Platform	Total unique posts	Share of single-region posts	Share of single-region top posts
Facebook	124	66.9%	3.6%
Instagram	211	45%	1.1%
YouTube	172	29.1%	2%
Google	161	30.4%	6.1%

Table 5: Finland result overview by social media platform

Compared to Indonesia, our search queries in Finland returned minimal election-related content. In fact, many of the top trending and geo-targeted posts we identified were irrelevant to the 2019 parliamentary elections. This lack of election-related results proved difficult, as we could not establish a clear reference point for the comparison of geo-targeted posts and overall top posts. However, we found that the few election-related trending posts in our dataset exhibited a consistent environmentalist theme. On Facebook, election-related geo-targeted posts served clear entertainment purposes and received low levels of engagement. Our analysis of content on Instagram and YouTube did not yield significant findings. We only found one relevant post on Instagram, while videos on YouTube were related to elections in general as opposed to the 2019 parliamentary election. In contrast, our Google results produced notable findings: all relevant ads, both regionally diverse and geo-targeted, supported the National Coalition Party, a member of Finland's previous ruling coalition, in an assumed effort to boost their visibility to eligible voters. Table 5 provides an overview of the results of

Finland. Here, Facebook had by far the highest share of single-region posts with 67%, followed by Instagram. Regional variation of content was more modest on YouTube and Google with around 30% each. However, despite having one of the lowest shares of single-region posts, Google has the highest share of single-region top posts, indicating that posts on this platform contained more regionally targeted content. On the other hand, Instagram, a platform with plenty of regional variation – that is a higher share of single-region posts – returned close to no posts that met our criteria for geo-targeting. At first glance, the results from Finland and Indonesia appear to share similarities, particularly with their comparable rates of regional targeting on Facebook. However, while the Indonesian results indicate low regional variance on the three other platforms, the Finnish results indicate a more balanced distribution of regionally-specific content.



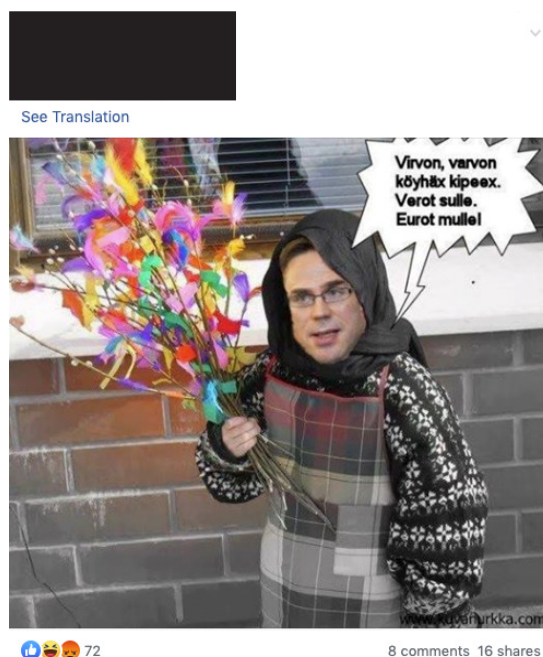
Facebook

On Facebook, we collected 124 unique posts from seven regions: Uusimaa, Northern Savo, Pirkanmaa, Northern Ostrobothnia, Finland Proper, Satakunta and Central Finland.

The share of single-region posts fluctuated greatly among the examined regions in Finland. The share of single-region posts varied from 52.1% in Pirkanmaa, the highest level of single-region posts, to 13% in Northern Savo, the lowest level of single-region posts. We identified three instances of geo-targeted content in Uusimaa, Pirkanmaa, and Finland Proper, which are also the regions with the highest shares of posts that are unique to their region.

These regions are densely populated, contain the largest urban areas in Finland and are, therefore, central to Finnish politics. Uusimaa contains Finland's capital, Helsinki, and is the largest region in the country with a population of 1.7 million out of a total of 5.5 million. Pirkanmaa, with half a million inhabitants, contains Finland's second largest city of Tampere. Finland Proper is the third largest region with a population of 478.6 thousand and encompasses the country's third largest city, Turku.¹⁸

On Facebook, we identified one post among the five most frequently occurring posts across all regions as pertinent to elections in Finland. The lack of posts trending across



Meme of the former PM

regions that contained election-related content rendered the establishment of a content baseline difficult. The only relevant post called on voters to inform themselves of their candidate's stance on the fur trade, explaining that Germany had recently outlawed the harvesting of animal fur and Finland could follow suit if they voted for animal rights advocates. The post was featured on an animal welfare Facebook page and received 2,553 total interactions.

We identified three geo-targeted Facebook posts in Finland Proper, Pirkanmaa, and Uusimaa (see Figure 3). These posts contained political and satirical themes and were likely shared for entertainment purposes. Our most notable finding was in Uusimaa, where a targeted post published on a satirical public Facebook group featured a meme of Finland's



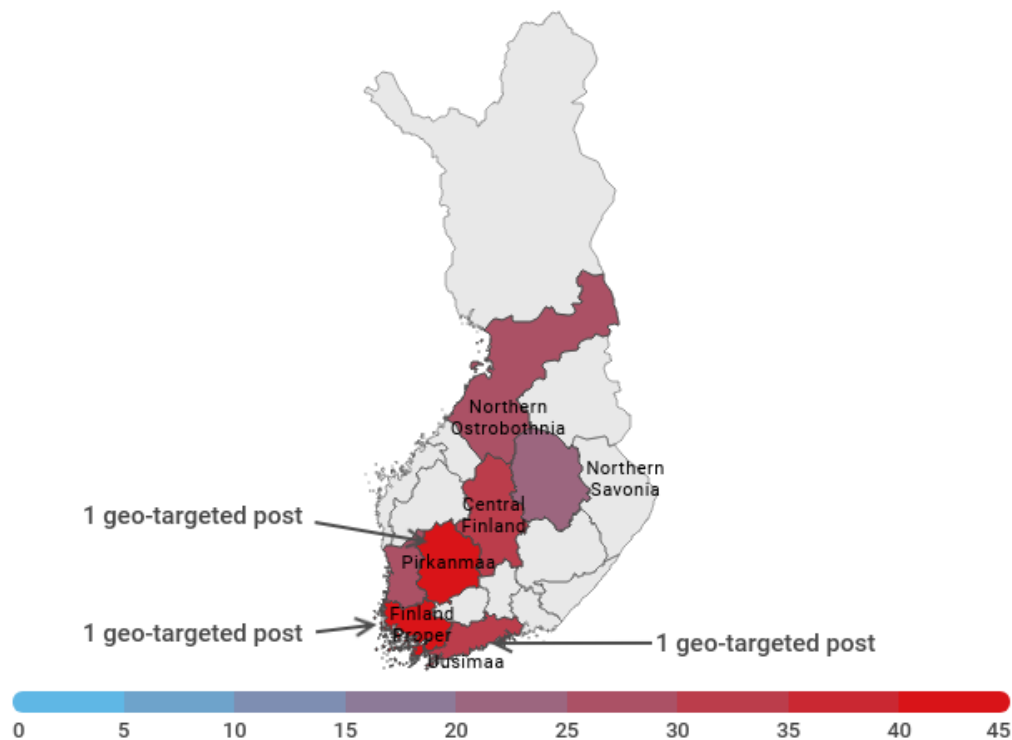


Figure 3: Map of Finland and regions covered when collecting Facebook search results

previous prime minister, Jyrki Katainen. In the photo (featured the page 31), Katainen’s face is superimposed over that of someone dressed as an Easter troll, casting a spell over the ‘poor and sick’ while saying ‘Taxes for you, euros for me.’ The meme received 96 total interactions on a public Facebook group that encourages its 6,587 members to share humorous political content.

The post that targeted Finland Proper could not be thoroughly analysed, as it was posted in a closed Facebook group. The group, entitled “Politics Forum”, has 1,014 members and claims to be a platform for individuals to discuss politics, societal topics and themes related to elections. The final geo-targeted post, which occurred in Pirkanmaa, appeared to

target a local audience. It featured a video of an individual conducting an election-related poll on the street. However, the sound quality of the video was too poor to understand its contents. Regardless of its substance, the video received a very low interaction rate of only seven likes.

Instagram

We gathered 211 unique posts from eight regions on Instagram, the same regions as Facebook with the addition of Päijänne Tavastia. The results can be seen in Table 6. As is evident in Table 6, Instagram returned very different results to our searches depending on our location. The share of single-region posts differs dramatically between regions.



Region	Number of unique posts per region	Share of single-region posts	Share of single-region top posts
Uusimaa	94	2.1%	0 %
Northern Savonia	80	1.25%	0 %
Pirkanmaa	81	66.67%	0 %
Northern Ostrobothnia	71	0%	0 %
Finland Proper	99	8.1%	12.5 %
Satakunta	80	1.25%	0 %
Central Finland	80	27.5%	0 %
Päijänne Tavastia	81	8.64%	0 %

Table 6: Finland Instagram results

Northern Ostrobothnia did not have any posts that were unique to its region, while among the regions that did feature single-region posts, their shares vary from 1.25% in Satakunta and Northern Savonia to 66.67% in Pirkanmaa. Despite having the highest share of single-region posts, there were no posts in Pirkanmaa that passed the top post threshold. Hence, we assume that none of the posts there were geo-targeted. The only single-region top post identified was in Finland Proper, which had one of the lower counts of posts that were unique to its region.

Our results for Instagram yielded no significant findings, as only one of the top five trending posts across all monitored Finnish regions on Instagram was related to the 2019 parliamentary elections. The trending election-related

post on Instagram was published by a fitness blogger and Miss Finland 2013 candidate. In the post, the blogger urges others to cast their vote for candidates that support combating climate change, an issue she explains is important to her, and offers tips for adopting environmentally friendly habits. The fitness blogger's photo received 887 likes. Instagram's geo-targeted content, which targeted Finland Proper, was not related to the general election and therefore irrelevant to this project.

YouTube

On YouTube, we analysed 172 unique posts from 12 regions: Uusimaa, Pirkanmaa, Northern Ostrobothnia, Finland Proper, Satakunta, Central Finland, Päijänne Tavastia, Espoo,



North Karelia, Vantaa, Lapland, and Ostrobothnia. As previously mentioned, on YouTube there was comparatively little regional variation in the posts we collected. It was the platform with the lowest share of single-region posts (29.1%). Vantaa had the highest share of single-region videos (21.4%), while Uusimaa had the largest quantity of single-region videos (20). Six of the 12 regions did not have any videos that appeared only in that region. And of the remaining six regions only one – Finland Proper – had a video that we consider to be targeted to this geography because it was returned in our searches more than once.

On YouTube, the trending cross-region videos returned by our search query also lacked relevance to the 2019 elections. The trending videos contained diverse content, ranging from a 2011 satirical music video about the position of gypsies in Finnish soci-

ety, to a classic Finnish comedy sketch about a prime minister, to a music video by a band named “President of the Republic.” The two most relevant trending videos featured an informational rundown of the six roles a Finnish president must fulfill and a video of the Finnish president visiting schoolchildren and answering their questions. While inherently political, these videos were unrelated to the 2019 parliamentary elections. These videos were likely recorded in the dataset due to our generalised keywords, but raise the question of why, during an active election period, such unrelated videos were returned. Our single geo-targeted result was similarly insignificant: the video we identified in Finland Proper was removed from YouTube.

Region	Number of unique posts per region	Share of single-region posts	Share of single-region top posts
Uusimaa	34	32.2%	9.1 %
Northern Savonia	23	13%	0 %
Pirkanmaa	48	52.1%	4 %
Northern Ostrobothnia	27	18.5%	0 %
Finland Proper	45	46.7%	4.8 %
Satakunta	27	22.2%	0 %
Central Finland	30	40%	0 %

Table 7: Indonesia Google results, ads



Google

The data gathered from 12 regions on Google consisted of 161 unique posts and four ads. We applied the same analytical method, identifying single-region posts and single-region ads separately. Overall, there was little content that appeared in just one region and only a handful of these results were also returned to us multiple times. In other words: among the search results collected, we assume very few to be targeted to one region in particular.

With regard to regular search results, the region of Northern Savonia had the highest share of single-region results (33.3%), with 11 of 33 posts appearing only in this region. However, none of these regional posts were also top posts. The remaining shares range between 1.6% and 15.7%. Uusimaa was the only region where we found three results that were targeted to this particular geography.

As initially noted, our searches returned four ads on Google. Three of these ads were single-region ads, with two appearing in Uusimaa and one in Northern Savonia. Of the 12 regions analysed, Uusimaa was the only region that featured both a single-region top post and a single-region ad.

In contrast, our qualitative analysis of trending, geo-targeted and paid-for posts on Google revealed content closely related to the parliamentary elections. The most frequently occurring search results across all regions circulated general and apolitical infor-

mation about the parliamentary elections. We identified a parallel between our Finnish and Indonesian Google results, as both featured Wikipedia pages about the broad concept of elections more broadly on the two countries' respective domestic election procedures. Two other search results provided links to the webpage of the Finnish Ministry of Justice, which displayed neutral information about the elections. One of these posts included a schedule of the 2019 parliamentary elections and received 306 interactions on Facebook and Twitter combined. The final trending search result linked to the political tab of Finnish state broadcaster, Yle. These findings demonstrate that Google searches using general election-related keywords in multiple regions of Finland directed individuals to educational material.

We identified three geo-targeted search results in Uusimaa, the country's most populous region. They featured local and mainstream media articles concerning the parliamentary elections. Of the three results, two proved relevant for our analysis. The first geo-targeted result linked to a local newspaper article, positing that the region had a strong chance of electing a Christian Democrat candidate to parliament. This article received only 60 total interactions on Facebook. The second, more divisive result featured an article about parliament's recent rejection of a civic initiative that would have guaranteed cost-free high school and vocational education. The proposed programme would have cost the state 150 million euros. This article received 2,023 total interactions on Facebook and Twitter, markedly high-



er than the local news article. However, it is difficult to compare this level of engagement with the regionally diverse search results because we did not identify any mainstream media articles among them.

On Google, we identified four ads, three of which were paid to promote the National Coalition party. The only ad that appeared in multiple regions supported National Coalition candidate Jenni Pajunen, who focuses heavily on issues of inequality, climate change and urbanisation. We identified three geo-targeted ads, two in Uusimaa and one in Northern Savonia. While the ad targeting Northern Savonia proved unrelated to the parliamentary elections, the two ads in Uusimaa were also found to support the National Coalition party. The ads in Uusimaa linked to the webpage of the National Coalition Party parliamentarian Jukka Kopra and to the official webpage of the National Coalition party.

Finland was governed by a three-party coalition consisting of the Centre Party, Finns Party and the National Coalition from 2015 to 2019. The coalition resigned in 2019 after failing to push major healthcare and welfare reforms through parliament. Following this leadership breakdown, the National Coalition Party paid for ads on Google in an attempt to regain voter allegiance both nationally and in Helsinki's home region of Uusimaa, specifically.

Comparative Results

We identified two distinct similarities between the Indonesian and Finnish results. First, we noted that for both countries Facebook returned more regionally specific content than other platforms. It had the highest share of single-region posts with 78.8% of content in Indonesia and 66.9% of content in Finland appearing exclusively in one region. In both cases, every region monitored featured at least one single-region post. In turn, YouTube and Instagram had the lowest shares of single-region posts in both countries. These findings suggest that, generally speaking, much more content is circulated on Facebook that is specific to a region. However, this does not necessarily mean that there is also more geo-targeting on the platform. After all, Facebook's share of single-region posts that appeared to be trending was not higher than other platforms.

The second pattern that we identified is that geo-targeting in both Indonesia and Finland is concentrated on regions with the largest populations and urban centres. This is where we consistently found trending posts that were unique to one region. In Indonesia, West Java featured single-region top posts on Facebook, Instagram, YouTube and Google. West Java has 43.1 million inhabitants and borders Jakarta, the nation's capital. We also identified such posts in East Java and Central Java, the second and third most populated regions in Indonesia, on Facebook and Google. In Finland, Uusimaa, which contains the capital Helsinki,



featured single-region top posts on Facebook and Google, as well as two single-region ads on Google. The results from Finland Proper, the third populous region, including trending posts that were unique to this geography on Facebook, Instagram and YouTube. These findings indicate that geo-targeting in both Indonesia and Finland concentrated on regions with the largest populations and urban centres.

In addition to these corresponding patterns, the data from Indonesia and Finland resulted in several differences. Most notably, our Google search results returned many more ads in Indonesia (23) than in Finland (4). This discrepancy suggests that more election-related ads were paid for on Indonesian Google than on Finnish Google. However, we note that our overall sample of search results was relatively small in both countries. In terms of the highest and lowest shares of geo-targeted content, Indonesia featured the greatest portion of single-region top posts on YouTube and the lowest on Google. In contrast, Finland featured the highest share of single-region top posts on Google and the lowest on Instagram.



Conclusions and Recommendations

Through our research in Indonesia and Finland, we aimed to answer two questions about the role of geo-targeting during election periods.

First, did election-related geo-targeting take place in Indonesia and Finland? And if so, did geo-targeting pose a threat to the democratic process in either country? In order to distinguish between normal and geo-targeted posts, we hypothesised that geo-targeted content had to fulfil two of three criteria. They had to be:

- 1) posts appearing in just one region and
- 2) appear at least twice in that region or
- 3) appear as a paid-for ad in that region.

Using aggregated Facebook, Instagram, YouTube and Google data from multiple regions in both countries, we applied these criteria and identified a number of geo-targeted posts on all social media platforms in our monitored regions of Indonesia and Finland.

In order to address the question of whether geo-targeting posed a threat to the elections in Indonesia and Finland, we qualitatively analysed the geo-targeted posts for the substance and purpose of their content.

In Indonesia, we concluded that most top

trending content provided apolitical and educational information to their audiences.

In contrast, we noted that a high number of geo-targeted posts shared articles and videos relating to the overseas voting scandal in Malaysia, suggesting that there was potentially an attempt to undermine trust in democratic institutions.

However, media coverage of the scandal was widespread among other regions as well, which received higher interaction rates than those articles targeted to specific regions. Ultimately, the heightened awareness of possible voter fraud in Malaysia appears to indicate a healthy media environment in Indonesia, even if the geo-targeted posts we identified are suspicious by virtue of the intent of targeting voters in a specific geography. However, in light of the disinformation-fueled violence that broke out after the election, media coverage of the ballot scandal in Malaysia may have been a precursor to the subsequent claims of massive election fraud.

Given the small share of geo-targeted posts that contained politically charged content in Finland, did not appear to jeopardise the democratic election process. We found that Finnish social media users searching with generalised keywords would not have found much pertinent information relating to the 2019 parliamentary elections. We did, however, identi-



fy a number of ads on Google promoting the National Coalition Party both nationwide and specifically in Uusimaa. This indicates that the National Coalition Party may have attempted to capture the attention of Finns who sought broad knowledge about the 2019 elections.

Despite these findings, we acknowledge that our research focused on the search results of generalised election-related keywords and analysed a fairly small sample of posts.

Given the limited results of our research, we recommend that the topic of geo-targeting during potentially contentious elections be pursued further.

We aimed to understand what the average individual in Indonesia and Finland would see when typing in general election search terms. However, we would recommend applying this methodological framework in different cases, using issue- or party-centric keywords, to compare how findings would differ.

Further investigation into the role of geo-targeting is vital to both understanding how social media platforms guide users to specific content and how their systems share content during election periods. Distorted or untruthful information, particularly when targeted at certain audience segments, can have a lasting impact on the world's democracies.

Hence, it is important to consider the tailoring of information to specific locations when monitoring the information environment during crucial political periods.



Endnotes

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