



BATTLE



TikTok: Instagram rival or vanishing fad?

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1.

INTRODUCTION

TikTok¹, a mobile app for sharing 15 or 60-second videos, has become wildly popular among teenagers worldwide and counts over 1.4 billion downloads. Launched by Beijing company ByteDance in 2017 for markets outside of China (based on the similar app Douyin for mainland China), TikTok is a short video sharing platform where users can watch and produce quick videos using music, stickers and animations as effects. While the number of monthly active users for short video apps in China doubled in 2017 to 414 million, last year TikTok became the most downloaded app in the U.S. and it is now available in over 150 markets and in 75 languages². In total, TikTok has been installed by around 564 million users so far this year and has been installed 1.45 billion times since launching.

This explosive growth is now pushing the app as a “major cultural force that exists beyond time”, as mentioned in a recent Wired story³. The reference points to a lack of a timestamp for those videos, which is problematic for time-sensitive material and makes it easier for people to steal content from other users. This drew some criticism and now TikTok is testing a timestamp feature⁴ for select users in order to increase its popularity.

Even more critical voices surfaced about a suspicion that the Chinese-owned app may be censoring the current protests in Hong Kong, according to a report from the Washington Post⁵. Indeed, a search for such material yields just a handful of videos on the unrest.

¹ “TikTok - Make your Day”, <https://www.tiktok.com>

² “Growing concern over TikTok, world's most downloaded app”, NBC News <https://www.nbcnews.com/nightly-news/video/growing-concern-over-tiktok-world-s-most-downloaded-app-71991877958>

³ “On TikTok, There is No Time”, Louise Matsakis, Wired, <https://www.wired.com/story/tiktok-time/>

⁴ “TikTok, the app without time, is testing a timestamp feature”, Caroline Haskins, Vice, https://www.vice.com/amp/en_us/article/qvge3v/tiktok-the-app-without-time-is-testing-a-timestamp-feature

⁵ “TikTok's Beijing roots fuel censorship suspicion as it builds a huge U.S. audience”, Drew Harwell and Tony Romm , The Washington Post, <https://www.washingtonpost.com/technology/2019/09/15/tiktoks-beijing-roots-fuel-censorship-suspicion-it-builds-huge-us-audience/>

Even if TikTok has said it follows the same guidelines as other apps in the U.S., other sources⁶ say instead that it seems to apply censorship laws governing other Chinese social media companies, like WeChat or Baidu. And a few months ago, an activist group in India⁷ said that TikTok encouraged pedophiles and pornography, and it was hit with a large fine in the United States for illegally collecting information from children.

Adding to such controversial issues, recently the US Democrat Senator Chuck Schumer urged his government to investigate TikTok⁸, describing the social media app as “a potential counter-intelligence threat we cannot ignore” and warning it could be used to interfere in US elections.

As a direct consequence, there latest events are having a have negative effects on TikTok growth. For the first time since its inception two years ago, the app saw global user-downloads fall, according to new data⁹ from Sensor Tower.

The app amassed an estimated 177 million first-time users across the Apple App Store and Google Play for the third quarter ended September. That represents a 4% decline from a year ago. It's the first time the hit app saw new installs drop on a quarterly basis, the mobile data provider said.

These controversies, along with a possible decline of its appeal, underline a crucial but often overlooked scenario: very little is known about TikTok inner workings, its user behavior and other internal data. Therefore, we decided to fill such gap with a study on these topics, while also providing a direct comparison with Instagram, considered by many its natural platform rival.

⁶ “TikTok may be censoring Hong Kong protests, Washington Post reports”, Sarah Min, CBS News, <https://www.cbsnews.com/news/tiktok-may-be-censoring-hong-kong-protests-says-washington-post-report/>

⁷ “TikTok: India bans video sharing app”, Benjamin Parkin, The Guardian, <https://www.theguardian.com/world/2019/apr/17/tiktok-india-bans-video-sharing-app>

⁸ “TikTok app poses potential national security risk, says senior Democrat”, Adam Gabbatt, The Guardian, <https://www.theguardian.com/technology/2019/oct/24/tiktok-foreign-interference-chuck-schumer-tom-cotton>

⁹ “TikTok maybe losing its appeal”, Shelly Banjo, Bloomberg, <https://www.bloomberg.com/news/articles/2019-10-24/chinese-owned-teen-sensation-tiktok-losing-appeal-data-shows>

Our effort is mostly aimed at a better understanding the actual impact and applications of current Chinese technologies across the world. While we know and accept that in China the internet censorship system is quite pervasive, it is still unclear if and how this same approach could be applied in other countries. This TikTok case study could provide an interesting window on these emerging trends (and dangers) that could affect tomorrow's social media at a global level.

We believe that our independent study could be helpful not only to social researchers, but also to companies, governments, and other entities interested in supporting privacy and new technologies. Also political and enforcement bodies need to figure out how to better protect digital citizen rights and dealing with such powerful online tools for the betterment of whole society.

In this research project our Ghost Data team¹⁰ applied the same analysis software on big data and visual recognition techniques used for our previous studies (in 2016 and 2019) about Instagram and counterfeiting¹¹. Even before that, in 2013, we started to address broader issues surfacing in popular social media environments, including botnets and malware, computational propaganda and intelligence, terrorism and counterfeit activities. With this new study we plan to expand and deepen our understanding of innovations, trends and issues that could potentially transform people online participation and (in the worst case scenario) produce conspiracy theories or viral misinformation, if not plain censorship.

¹⁰ "Ghost Data", <https://ghostdata.io>

¹¹ "Instagram and counterfeiting in 2019: new features, old problems", Ghost Data, https://ghostdata.io/report/Instagram_Counterfeiting_GD.pdf

Methodology and Main Goals

We applied our Ghost Data analysis software to a large set of users: about 3,5 million each from both Instagram and TikTok. We analyzed and compared the following public data:

For Instagram:

- First and last name
- Nickname
- Biography
- Total number of posts
- Followers
- Following
- Stories
- External links
- Private (y/n)
- Verified (y/n)
- Shares
- Likes
- Comments for posts
- Stories

For TikTok:

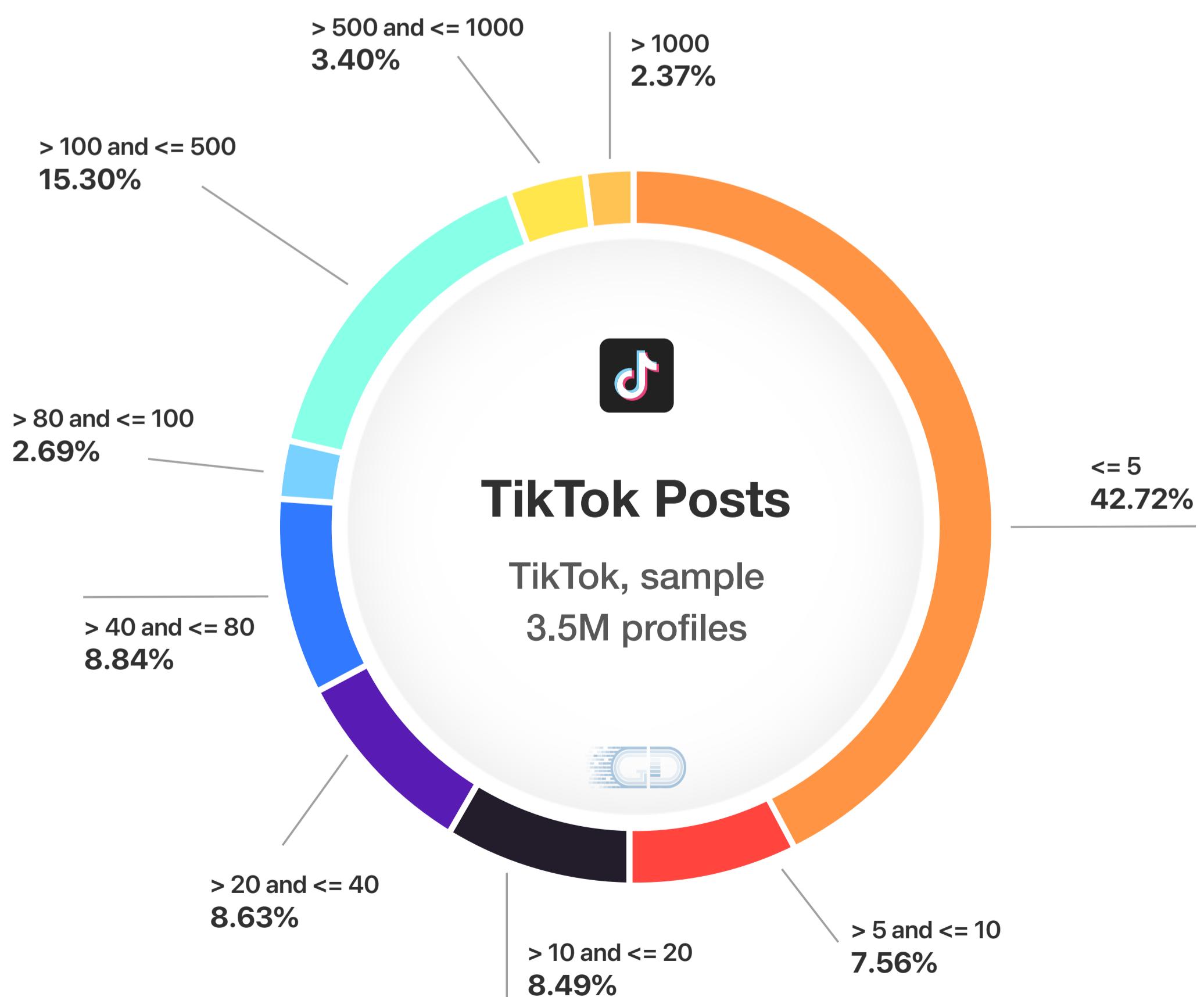
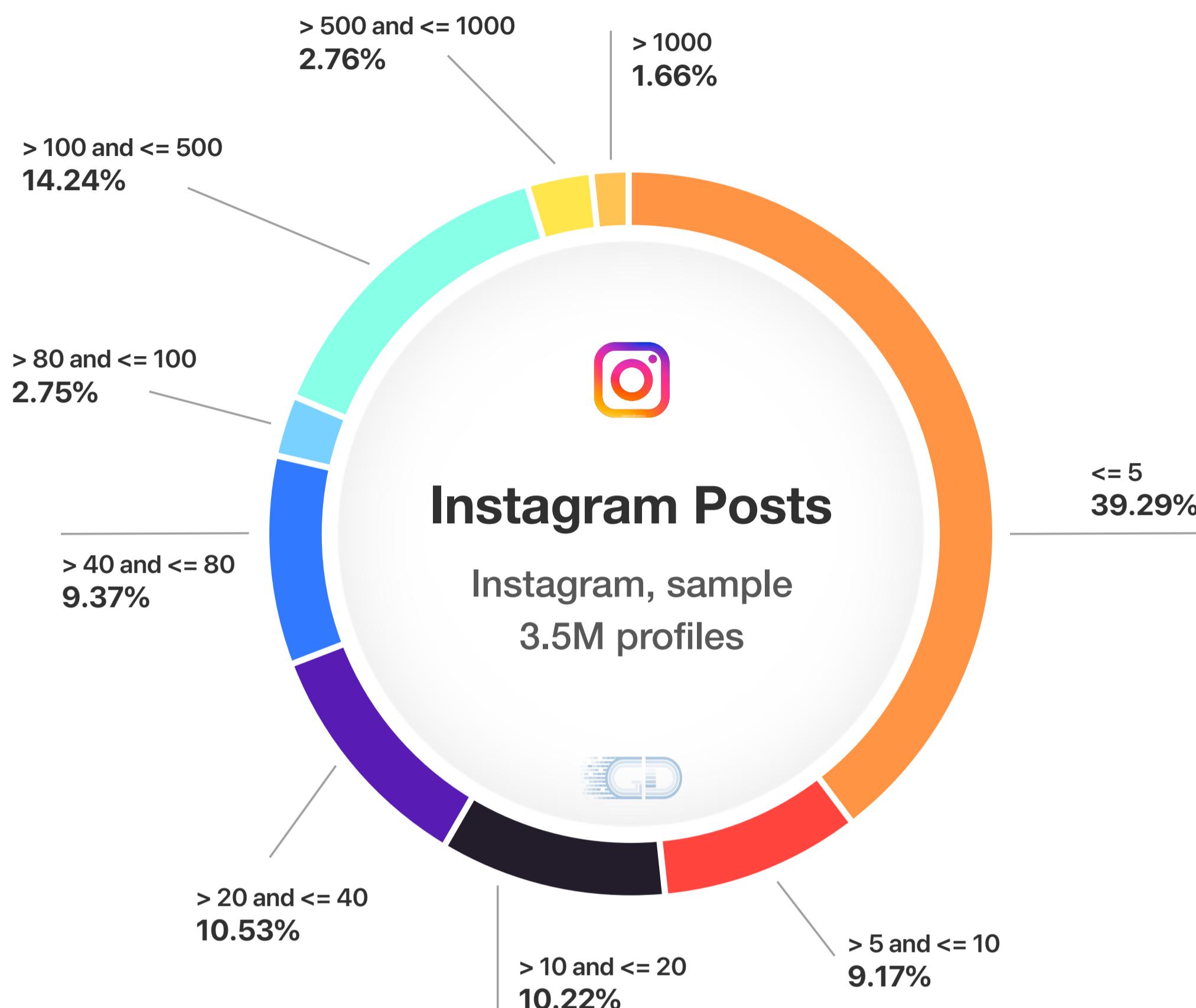
- User-id
- Username
- Nickname
- Signature
- Total number of posts
- Followers
- Following
- Hearts
- Private (y/n)
- Verified (y/n)
- Shares
- Likes
- Hearts
- Comments for posts

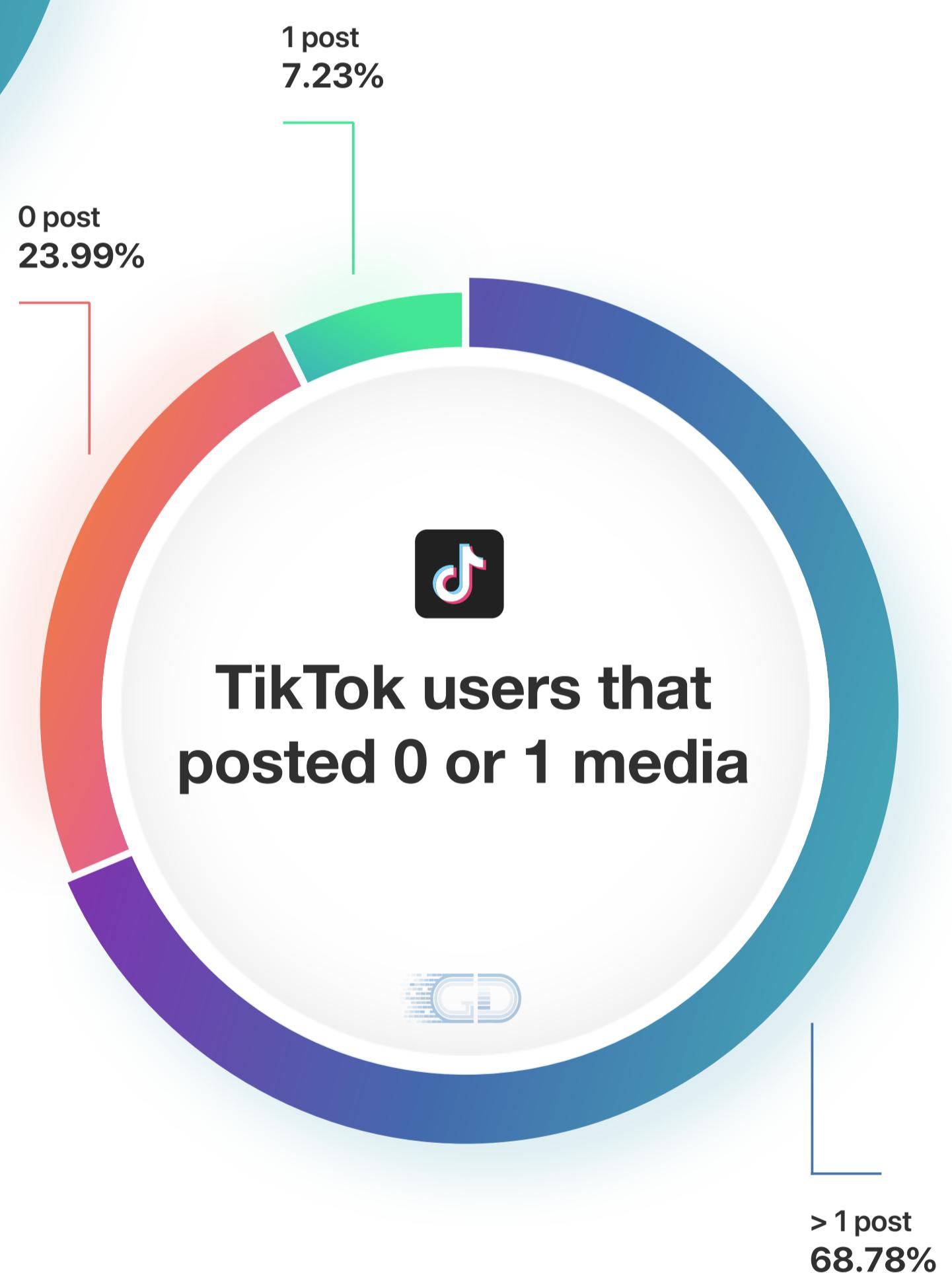
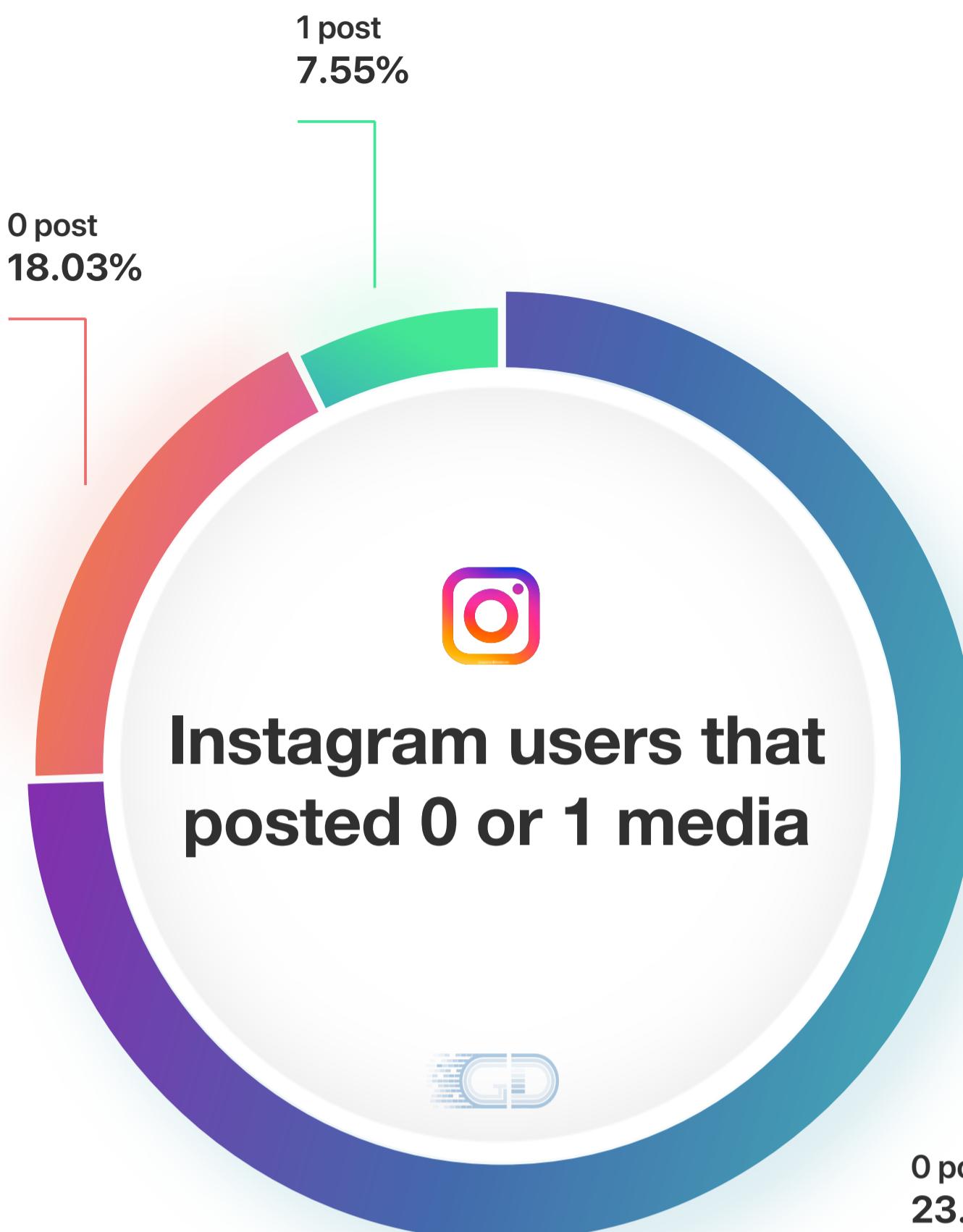
Such specific metrics data reveals which social network managed to attract more followers, whether users are more active or can generate more interactions. Our data also expose which of the two social networks counts more suspicious users.

We also made a comparison of user activities during last summer (June-July-August).

Despite obvious differences between the two social networks, here below we propose a general comparison about similar options and features on the two platforms.

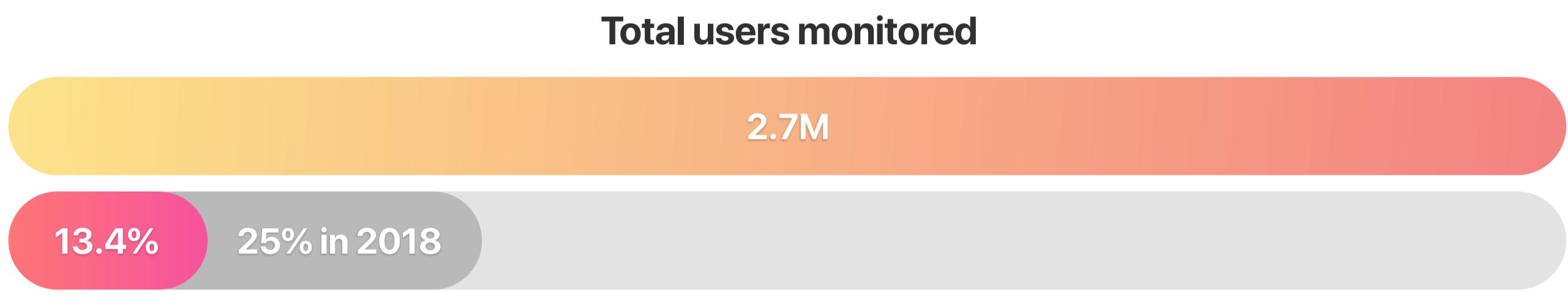
Comparison of total posts on Instagram and TikTok





As shown in the graphs above many more users on TikTok (vs. Instagram's) have published between 101 and over 1000 posts. However, we'd point out that Instagram also allows ephemeral contents (Stories) that cannot be compared directly with other media format or typical posts. Therefore, we monitored the average daily Stories content of an average Instagram user.

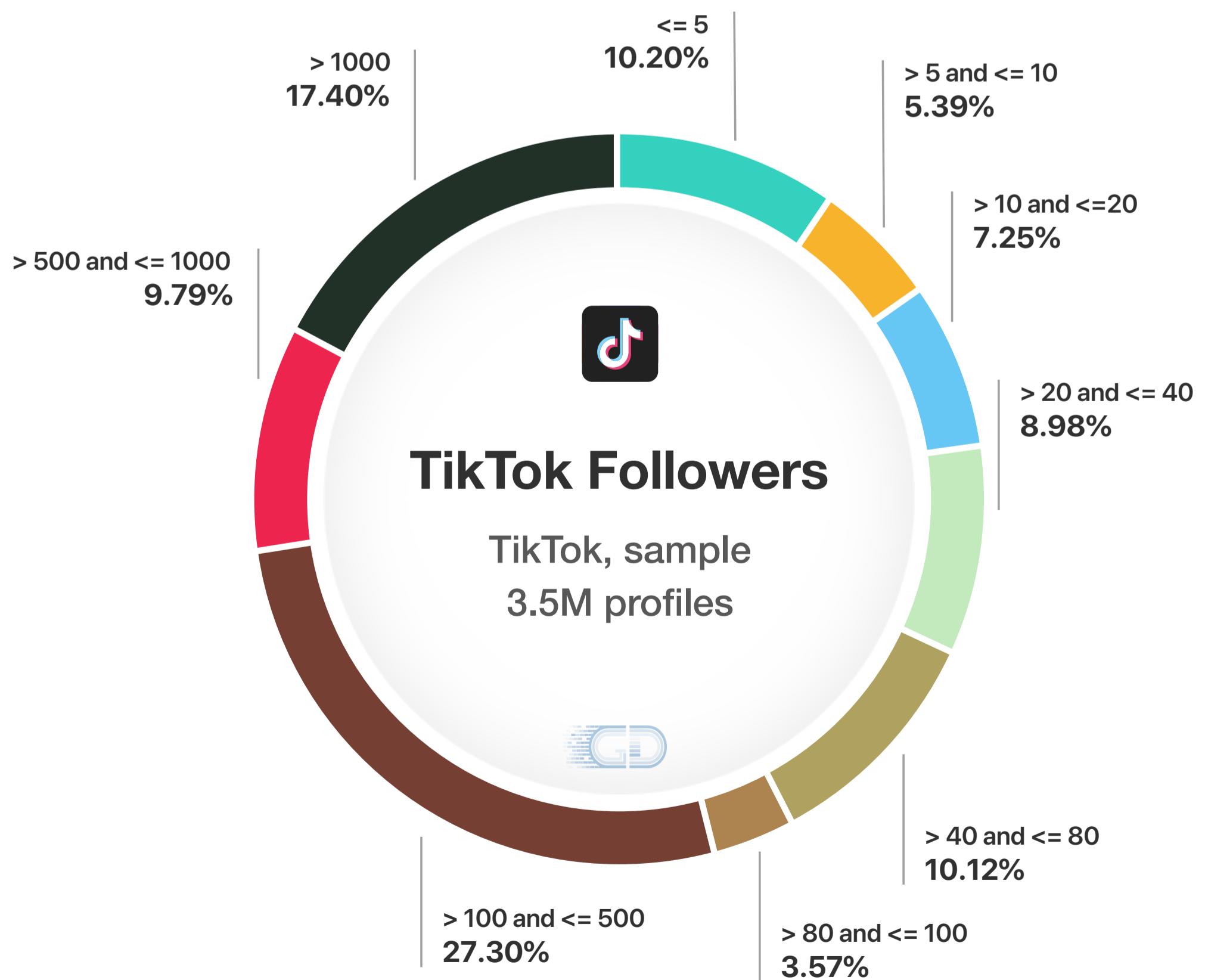
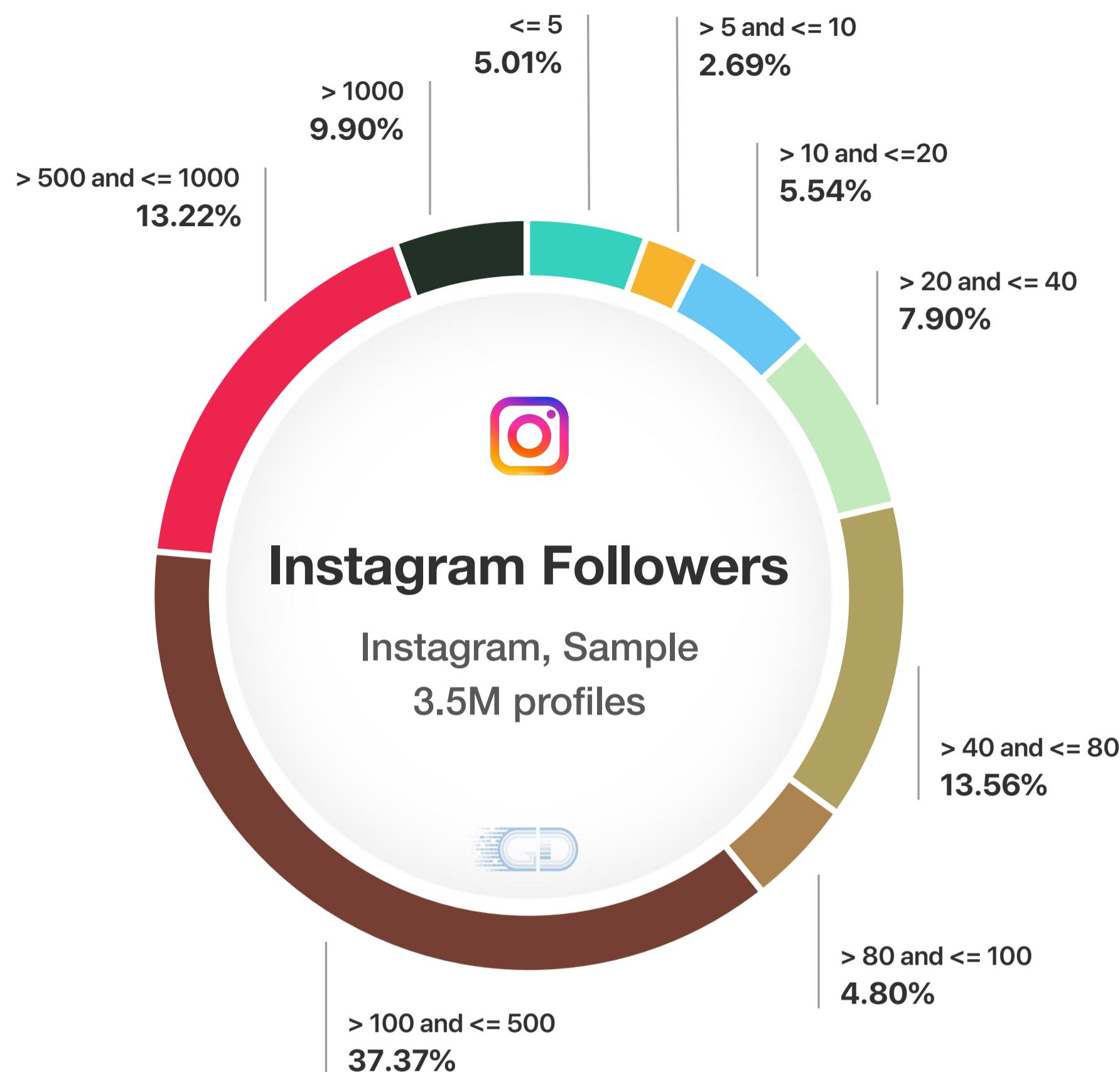
We monitored for continuous 21 days the activity of our sample users (over 2,7M), identifying those who published Stories starting on September 26th, 2019.



We found that, while one year ago users posted at least one Story within 21 days, now percentage declined¹²

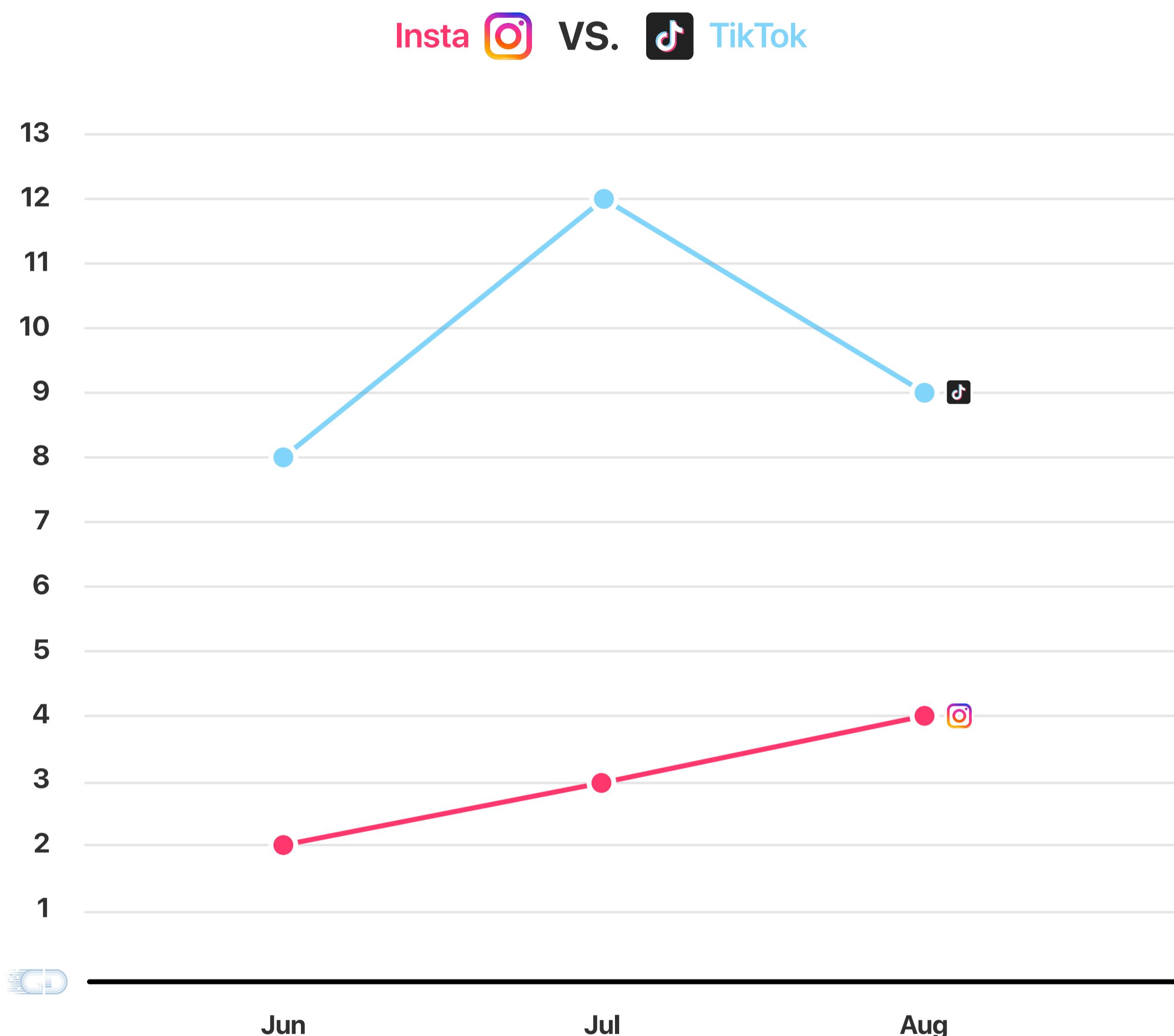
¹² "Instagram's Growing Bot Problem", By Reed Albergotti and Sarah Kuranda, The Information, <https://www.theinformation.com/articles/instagrams-growing-bot-problem>

Follower distribution on Instagram vs. TikTok



Content uploaded by average users in June-August

The following chart show the Instagram posts by an average user during the June-August period, followed by a similar graph about posts by a TikTok average user.



Instagram vs. TikTok user activity

The following section provides a direct comparison between the two samples of users, based on the influencer MediaKix model.

We analyzed the most important metrics to understand and compare user activity: average number of published posts; average likes, comments and shares (for TikTok) received by these posts; average of video views and average of related interactions, that is, the sum of actions performed by users on a specific post (click, like, comment, share).



TikTok



Instagram

1-10k nano influencer

	TikTok	Instagram
Sample size	730 000	730 000
Avg. Posts	113	111
Avg. Like posts	23	49
Avg. Comments Posts	24	2
Share	32	
Video Views	20	12
Avg. Total interactions per post	79	52

10-50k micro influencer

	TikTok	Instagram
Sample size	4600	4600
Avg. Posts	483	887
Avg. Like posts	365	667
Avg. Comments Posts	48	21
Share	47	
Video Views	730	761
Avg. Total interactions per post	460	689

¹³ "What Are Mid-Tier Influencers?", MediaKix, <https://mediakix.com/blog/what-are-mid-tier-influencers/>

50-500k mid-tier

Sample size	900	900
Avg. Posts	664	1486
Avg. Like posts	3314	4338
Avg. Comments Posts	210	72
Share	131	
Video Views	3450	3507
Avg. Total interactions per post	3655	4411

500-1M macro influencer

Sample size	55	55
Avg. Posts	501	1641
Avg. Like posts	21310	22719
Avg. Comments Posts	1200	1105
Share	1320	
Video Views	15763	16458
Avg. Total interactions per post	23830	23824

1M+ mega influencer

Sample size	120	120
Avg. Posts	1215	2603
Avg. Like posts	98770	102738
Avg. Comments Posts	1874	1623
Share	2880	
Video Views	87865	96082
Avg. Total interactions per post	103524	104361

TikTok users with 1-10,000 followers are slightly more active than Instagram's, both in terms of total interactions and of video views. The opposite is true for users with 10,000-50,000 followers and up to 500,000 followers: Instagram accounts appear to be more active in general.

For users with up to one million followers, Instagram accounts generate a larger amount of video views, while on TikTok the “share” option produces a larger number of total interactions.

The so-called “mega-influencers” (accounts with over a million followers) are definitely more active on Instagram, particularly about video views and producing slightly more total interactions.

Locating fake accounts/bots on Instagram

In our previous 2018 research about Instagram, we purchased 20,000 spambots-followers on the underground market of fake accounts and extracted their profile data to compare them with a sample of users analyzed and to estimate the percentage of fake accounts. The share of suspicious accounts totaled about 9,5% of such accounts.

We also focused on those users who met the following requirements (extrapolated from the analysis of 20,000 fake users purchased):

- Ratio following/followers: 4,5
- Uploaded media: between 0 and 9
- Stories posted in the past 21 days: zero

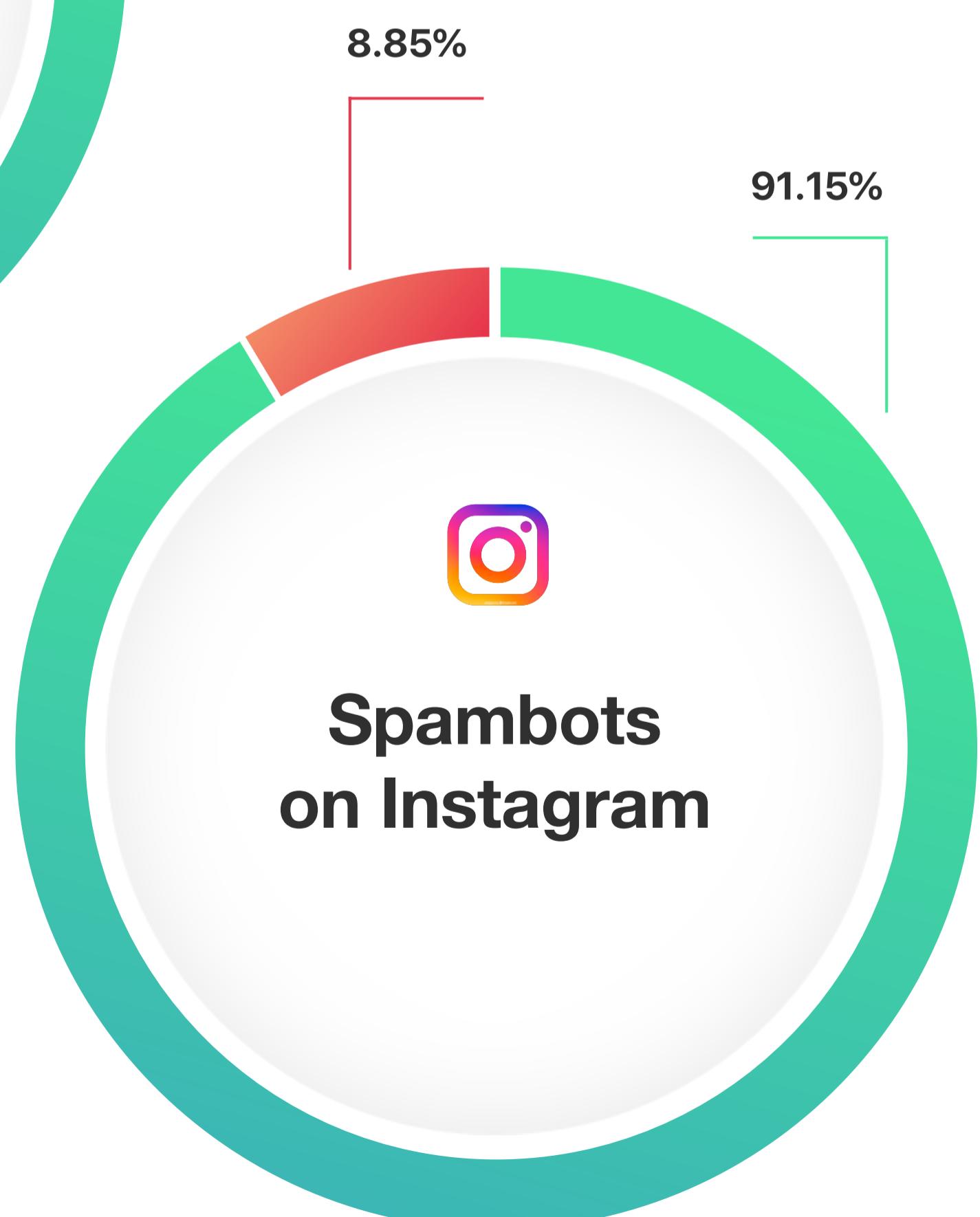
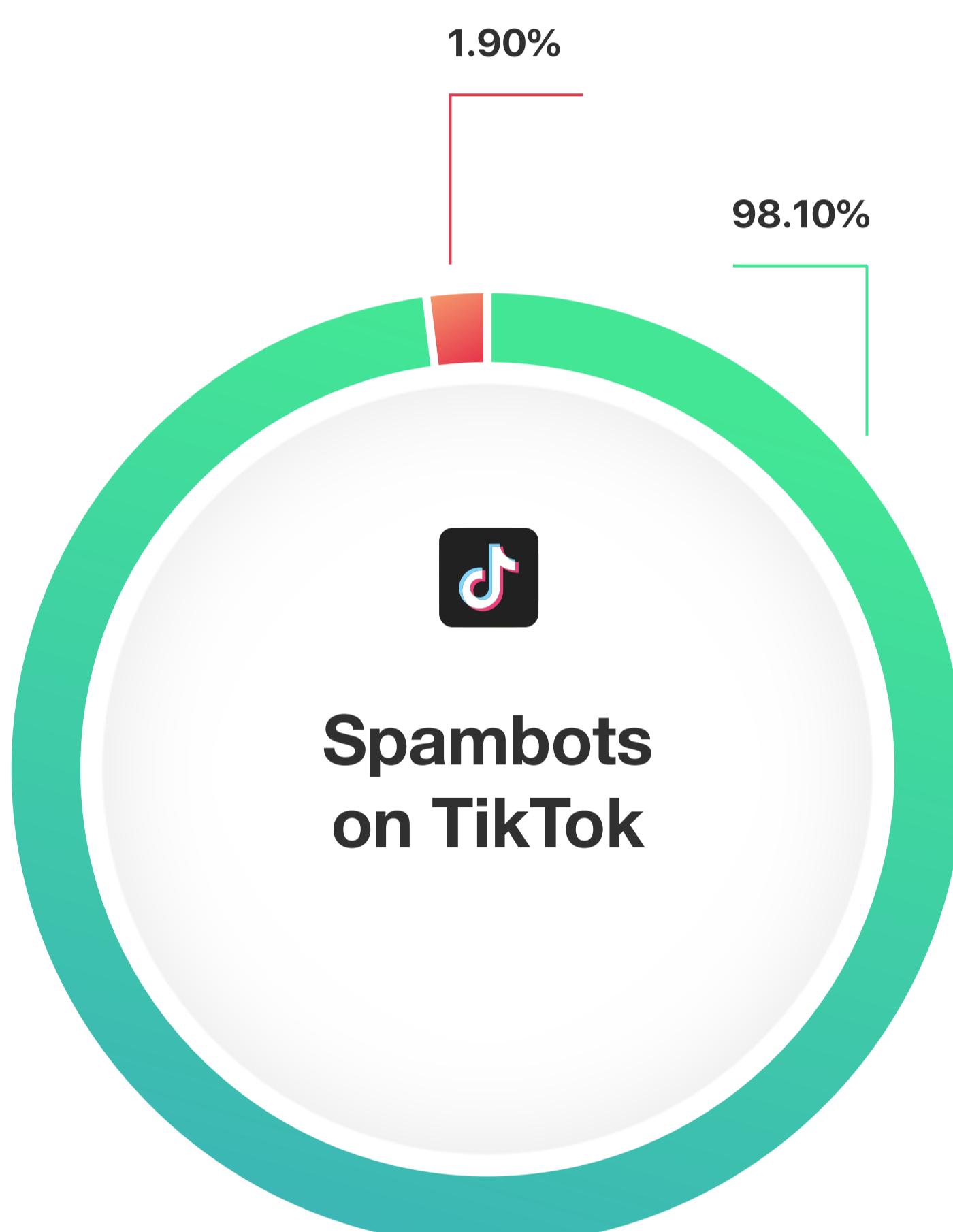
A similar analysis carried out again after one and half year reveals that suspicious accounts dropped from 9.5% to 8.85%. A clear improvement showing that Instagram is finally stepping up its fight against bots and suspicious accounts.

Locating fake accounts/bots on TikTok

The same strategy was applied to our current research. we purchased 20,000 spambots-followers on the underground market of fake accounts and extracted their profile data to compare them with the Instagram user sample to estimate the percentage of fake accounts. Here are the many findings related to TikTok bots:

- Ratio following/followers: 23
- Uploaded media: between 0 and 5
- Username = name surname eg. florencejackson, florencejackson; OR username + numbers
- Unverified accounts

Overall the suspicious accounts are less than 2% - a significantly lower amount than on Instagram.



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CONCLUSION

While for almost 4 years our research addressed various aspects of Instagram users and activities, this time we focused on its possible rival, TikTok, in order to shed some light on its relatively unknown inner workings, user behavior and other internal data.

It is worth to note again the crackdown on Instagram fake accounts, which dropped from 9.5% in June 2018 to 8.85% in October 2019. Also post activity indicators and account followers show clear improvements: on average, a larger amount of users have more followers and more users have published at least one content or post.

However, the average user activity related to the Stories seems declining. While in our 2018 study about 25% of users published at least one Story in 21 days, now we found that this holds true only for 13,4% of total users.

Last summer, TikTok has surpassed Instagram in regards to average number of posts per user, and its new accounts quickly attract an audience that generates interactions almost as much as on Instagram.

These figures seem to suggest that TikTok has the strength to become a direct Instagram rival, especially if it will be able to clone the Stories format or to build a new disruptive format, as Instagram did when mirroring certain Snapchat features. Our study also seems to suggest that, even if Instagram generates slightly more interactions in general, somehow TikTok ensures more visibility to quality content. Many videos that are seen millions of times in a short period of time are not necessarily produced by brands or "influencers" -- more often than not, they are actually posted by common users. This is due to a specific TikTok feature: its algorithm tends to reward not just authoritative users (ie, verified and long established accounts with many followers), but also to increase the visibility of any original content that gets shared frequently. This strategy (quite different from Instagram's) could become a real asset for TikTok future, potentially allowing anyone to become "famous" and to easily share their content on the platform.

In any case, as mentioned in the introduction, TikTok needs to find quick and appropriate solutions to several controversial issues, particularly about user privacy, censorship and security. On the other hand, Instagram cannot ignore its own problems: sharing of child pornography, sale of illegal or counterfeit goods, increasing of spam and political propaganda. Despite its recent crackdown on bots and suspicious accounts, such issues should be addressed in a more serious and vigorous fashion -- a strategy that should be extended to all social media platforms. For example, recently an Italian news website reported that a pedophile tried to lure children even on TikTok (and WhatsApp): it's urgent to be proactive and intervene especially on online platforms mostly used by very young people.

The social media landscape is constantly changing and we should expect new players and more disruption in the next future. Our research shows that it is too early to simply dismiss TikTok as passing fad. It seems rather gaining space (and users) as a young enterprise still in progress and to be watched more carefully. It is hard to say now if it could last or how it could morph to keep growing in such a competitive market. In any case, our data show that at the moment TikTok is directly competing with Instagram at a global level.

It remains to be seen whether, in addition to solving the above mentioned issues, TikTok will actually be able to further expand and refine its main features of virality and functionality. As a next step, probably the Chinese app will try to stretch its social reach all over the world, while keep growing by enhancing its video-sharing and other options that already differentiate it from Instagram. We will continue to closely follow its developments, in order to update our data in this study and to anticipate outcomes and problems of tomorrow's online landscape.

¹⁴ "Modena, pedofilo tenta di adescare bambini su TikTok e Whatsapp. Circola una foto, ma non condividerla!", Open Online, <https://t.co/tFGtPcAU31>,