

## Letter to the Editor

# Monkeypox goes viral: measuring the misinformation outbreak on Twitter

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**Key words:** Monkeypox; reemerging; zoonosis; concern; global.

*J Infect Dev Ctries* 2022; 16(7):1218-1220. doi:10.3855/jidc.16907

(Received 26 May 2022 – Accepted 11 June 2022)

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Dear Editor,

Monkeypox has been a global concern since May 2022 because cases have been reported from 19 non-endemic countries across three World Health Organization (WHO) regions [1]. The recent outbreak has sparked international concern, allowing for the dissemination of unregulated information through social media. Previous studies have highlighted the misinformation spread on Twitter (Twitter, Inc., San Francisco, CA) during recent public health emergencies, mainly Ebola, Yellow fever, and COVID-19 [2-6]. Therefore, we investigated the quality of monkeypox information on this social networking platform.

A search on Twitter was performed on May 24, 2022, to collect the 100 top tweets in English with the term "monkeypox" and with at least 100 replies, retweets and likes, using the search strategy: "monkeypox min\_replies:100 min\_faves:100 min\_retweets:100 lang: en". The tweets' overall information was divided into medically correct information, humorous or non-serious posts, and misinformation content. Tweets classified as "medically correct information" contained any accurate information regarding epidemiology, forms of transmission, symptoms, diagnostic testing, treatment,

and prognosis of monkeypox, according to the evidence presented by the WHO [7]. In addition, user accounts were classified based on content into the following categories: informal individual/group, news outlet/journalist, and healthcare/public health. All links (Uniform Resource Locators) and images posted in tweets were also retrieved and analyzed. Statistical analysis was performed using the STATA v.14.0 software (StataCorp LP, College Station, TX).

Most tweets were posted by informal individuals or groups (60%), followed by healthcare/public health (32%) and news outlets or journalists (8%). Most tweets (52%) included misinformation and unverifiable information, 20% included humorous/non-serious content, and only 28% of the collected tweets provided serious information regarding monkeypox (Figure 1). The misleading tweets were more likely to receive replies (median 582 vs 479,  $p < 0.001$ ), retweets (7,508 vs 7,104,  $p < 0.001$ ) and likes (28,604 vs 22,362,  $p < 0.001$ ) compared to the medically correct content (Figure 1). When analyzing Twitter accounts by user category, informal personal/group accounts had more misinformation when compared to others ( $p < 0.001$ ), and healthcare/public health accounts had the lowest rate of misinformation compared to other types of accounts ( $p < 0.001$ ). Among hashtags/search terms, the

**Table 1.** Samples of misleading content about monkeypox in collected tweets.

Text from Tweets*
I think this monkeypox business is complete bollox.
Now I'm being called a conspiracy theorist because I happened to notice that last year Gates funded a tabletop game in which a Monkeypox virus pandemic begins May 15, 2022. It's "conspiracy theory" to notice what institutions post on their own pages?
Is it really monkeypox? Or is it Pfizerpox?
Monkeypox.... I bet Big Pharma has been working on a new money-making vaccine for months. How many jabs will it take to get rid of the Monkeypox virus. Stay tuned
MONKEYPOX? NO. It's called SHINGLES and it's a known "adverse reaction" to the jab. LOOK, they even tried to use a picture of SHINGLES and call it MONKEYPOX connect the dots people, wake up

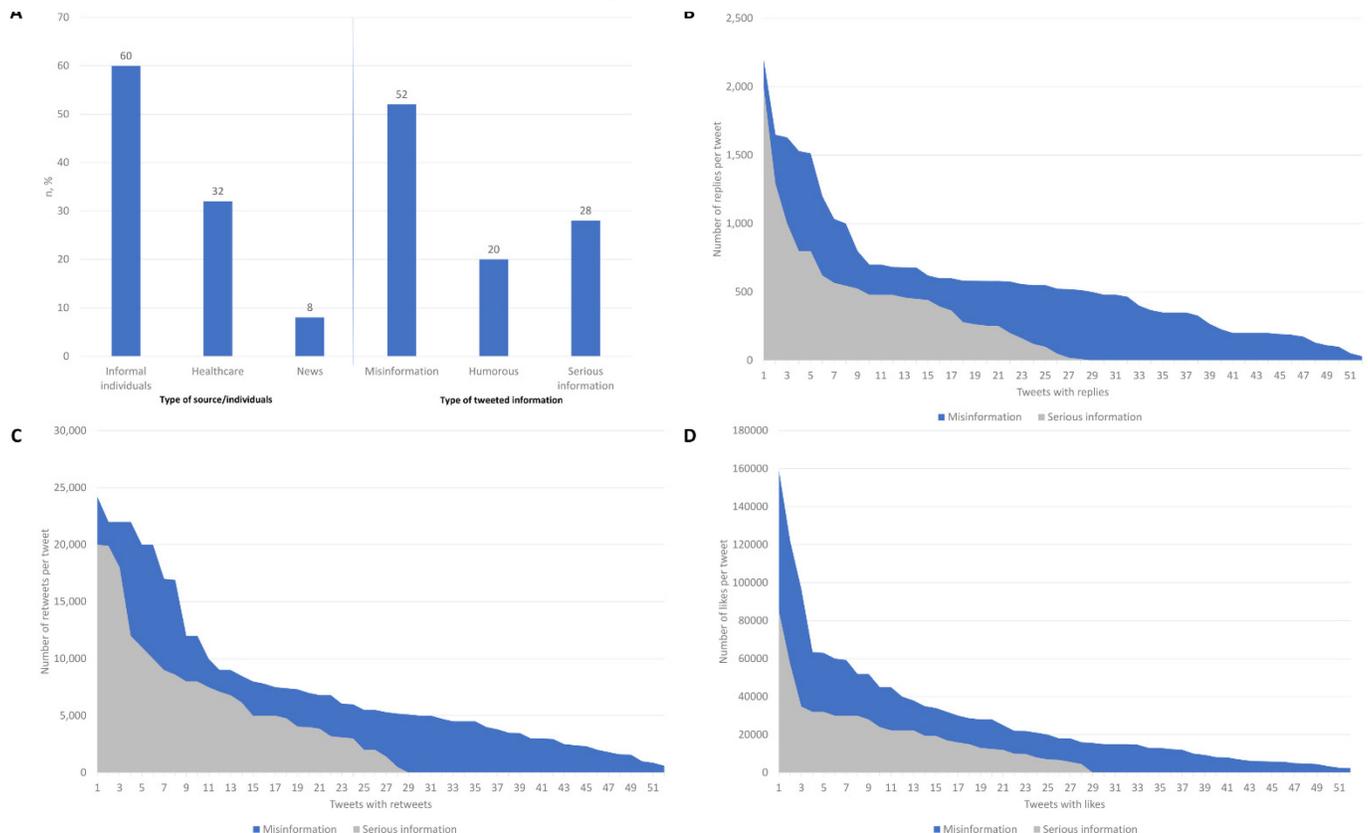
\*Links and usernames were removed.

term "Monkeypoxalypse" was associated with the highest rate of misinformation, while the hashtag "#IDTwitter" had the highest levels of serious and correct content. The most common misinformation was that the current outbreak of monkeypox is not real and is a conspiracy of international institutions (Table 1). Further analysis of links revealed a high number of fake news websites.

As in previous outbreaks (e.g., Ebola, COVID-19) [5,6], social media users, including those on Twitter®, react to these epidemiological situations. Unfortunately, our results showed an alarmingly high rate of misinformation and unverifiable information about monkeypox during the ongoing 2022 outbreak,

and interestingly, we found a more significant number of replies, retweets and likes of misleading tweets, which suggests a rapid spread and scope of misinformation on this social network, especially in times of public emergency. We provided an early analysis of this misinformation spread. We highlighted the importance of prompt interventions to offer accurate and reliable information via social media platforms that can help combat infodemics, misinformation, and rumours in the current monkeypox outbreak. Furthermore, real-time monkeypox surveillance on social media can be a valuable tool for public health agencies and organizations.

**Figure 1.** Analyses of the top 100 tweets on monkeypox. **A.** Type of source/individuals and tweeted information; **B.** Comparison of the number of replies, according to the type of tweeted information; **C.** Comparison of the number of retweets according to the type of tweeted information; **D.** Comparison of the number of likes according to the type of tweeted information.



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**Conflict of interests:** No conflict of interests is declared.