

Assessing the Quality and Reliability of Rheumatoid Arthritis Exercise Videos on TikTok and YouTube

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ABSTRACT

Objective: An autoimmune condition that frequently affects the synovial joints and other organ systems is called rheumatoid arthritis (RA). Social media platforms are increasingly used to access health-related information. The purpose of this study is to evaluate the RA exercise videos on YouTube and TikTok in terms of their accuracy, quality, and content-specificity.

Methods: The term “rheumatoid arthritis exercise” was sorted on YouTube and TikTok on 25 July 2023. To simulate an average search query, the keyword by “top” results on TikTok and by “relevance” on YouTube were used. The Journal of American Medical Association (JAMA), DISCERN, and Global Quality Scale (GQS) scoring systems were used to evaluate the information’s quality and accuracy. Additionally, the videos’ attributes and sources were examined.

Results: Fifty videos from each platform were included out of the 186 videos that were evaluated. YouTube videos had more views (35438 vs. 5989, $p<0.001$), likes (871 vs. 199, $p<0.001$), and uploads by doctors (34% vs.14%, $p<0.001$) in addition to being longer (12.12 minutes vs. 0.42 minutes, $p<0.001$). YouTube videos were also significantly more likely to receive high DISCERN reliability, quality and overall scores (21,5(11) vs. 15(6), 15(9) vs. 9(4) and 40,5(21) vs. 28(9), $p<0.001$, respectively). In addition, YouTube videos had higher GQS scores and JAMA scores (24% vs. 4%, 2(1) vs. 1(1), $p<0.001$, respectively).

Conclusion: RA exercise related videos are more likely to have higher quality and accuracy on YouTube than on TikTok. It is important to provide videos by healthcare professionals to guide patients about accurate and high-quality health-related information.

Keywords: Rheumatoid arthritis, exercise, social media platforms, YouTube, TikTok



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INTRODUCTION

One of the most common autoimmune diseases, rheumatoid arthritis (RA) primarily affects the synovial joints along with several other organ and tissue systems, such as the heart, lungs, and blood vessels [1]. The general population’s

prevalence ranges from 0.5% to 2% [2]. The pathogenesis of disease are complex and chronic inflammatory process leads to joints destruction as well as extra-articular involvement [3]. Numerous pharmacological and non-pharmacological treatment approaches for RA patients have advanced dramatically in

terms of their ability to lower inflammation, relieve symptoms, or impede the course of the illness [4]. For the safe and effective treatment of chronic inflammatory joint diseases like RA, exercise therapy is essential [5]. Previous studies have demonstrated that specifically designed exercise programmes such as aerobic exercises and muscle strength trainings improve physical functions, cardiorespiratory capacity, pain and have an improvement in RA patients' cognitive status [5,6].

Patients and healthcare professionals are using the internet and social media more and more to access online health information. Many patients use various social media platforms to search for health sources and medical information due to the rapid growth of health information in these platforms [7,8]. It is also crucial to remember that social media use among patients prior to hospital visits is widespread, and people frequently share their online experiences [8,9]. YouTube is one of the mostwell known video sharing web sites that has over 30 billion daily usersand has a lot of videos about healthcare, including ones about diagnosis, treatment, and prevention [10,11]. Recently, TikTok, another video-sharing social media platform, has become apopular sources of health information [12]. TikTok provides easy, quick and widespread access to medical information and reaches more than 1 billion active users [13,14]. Numerous recent studies have examined the quality of health-related content and video features on TikTok and YouTube social media platforms in the literature [15-17].

To our knowledge, no research has examined the accuracy and consistency of the data regarding RA exercises on these platforms. This study was designed to examine and compare the accuracy, quality and video contents of YouTube and TikTok videos related to RA exercises.

Main Points:

- The likelihood of YouTube videos receiving high DISCERN reliability, quality, and overall scores was significantly higher.
- Compared to TikTok videos, physician YouTube uploads were substantially higher.
- When it came to health information, the videos on YouTube about RA exercises were more accurate and of higher quality than those on TikTok.

MATERIALS AND METHODS

The study was designed as a cross-sectional study and examined the content of social medial videos. Since all of the videos are available online and don't feature any human or animal participants, ethics committee approval was not necessary. There are previous studies in the literature using the same protocol [11,18]. After the search history was deleted, the term "rheumatoid arthritis exercise" was sorted on TikTok and YouTube and on July 25, 2023. All searches were performed onthe web-based application with its cache cleared and deleted cookies. To simulate an average search query, the keyword by "top" results on TikTok and by "relevance" on YouTube were used. Videos were included if they were English language, relevant to the RA exercise, and had acceptable audiovisual quality. Non-English videos, duplicated content, videos with no audio, videos unrelated to RA exercise, and advertisements were excluded from the examination. Additionally, videos shorter than 20 seconds were excluded, as viewer engagement decreases significantly in concise videos. Research indicates that the majority of users typically click on the videos located on the first three pages of search results [15,18]. So, after implementing the exclusion criteria, the first 50 videos on each platform were independently reviewed by two researchers (TOC and NK).

The duration of the videos (months of upload), the total number of views, comments, comments per year, likes, shares, and records (for TikTok only), account subscribers/followers, and the length of the videos (minutes) were all recorded for each video. The number of views per year and per like were also calculated for each video content. In addition, daily viewing rate (number of views/video upload time), daily like rate (number of likes/video upload time X 30), and the number of views per daily video popularity (Daily video power index (VPI) [Daily viewing rate x daily like rate / 100]) were calculated for each video. In addition, the video quality was rated as low, medium, and high and the sources of the videos were examined as physicians, non-physician health professionals, trainers, patients/individual users, health-related organizations/websites, and others.

Two tools were used to assess the videos' quality and accuracy: the Global Quality Scale (GQS) and the DISCERN questionnaire. The 16-item DISCERN scale uses a scoring system ranging from 1 (poor) to 5 (good) to evaluate the quality, bias, and reliability of video information. The reliability of the information is evaluated in the first eight questions. The next seven questions evaluate the quality of the information on available treatments, and the final

question relates to the overall quality score. After adding up all 16 questions, the total DISCERN score falls between 0 and 80, and it can be further classified as very poor (<27), poor (27–38), fair (39–50), good (51–62), and excellent (63–80) [19-21].

The GQS is a scoring system consisting 5-point scale (1–5) that is used for the quality analysis. It measures the flow of information, usefulness and educational value of the videos. In the GQS scoring system, scores 1 and 2 were considered as ‘low quality’, a score of 3 was considered as ‘intermediate quality’, while 4 and 5 were considered as ‘high quality’ [21].

This study also made use of the JAMA (Journal of the American Medical Association) scoring system. It is employed to evaluate the caliber of content on websites pertaining to health [22]. Every criterion carries one point. The criteria are composed of four elements: Authorship, Attribution, Disclosure, and Currency. Points are awarded in a range of 0 to 4. Accordingly, 0 is considered the lowest score because it does not meet the criteria and 4 is considered the highest score because it meets all the criteria. Higher scores obtained in the scoring system indicate that the quality of the evaluated information has increased.

Statistical Analysis

The gathered information was methodically entered into Microsoft Excel spreadsheets (Microsoft Corporation, Redmond, Washington), and SPSS software for Windows version 23.0 (SPSS, Inc., Chicago, Illinois) was used to analyze the information. The study uses counts and percentages to represent categorical variables and mean plus standard deviation or median and interquartile ranges to represent continuous variables. To check if the numerical data confirms to normal distribution, we used the Shapiro-Wilks test. The test revealed that the parameters of the videos on both platforms were not normally distributed. The chi-square test was used to compare categorical data, and the Mann-Whitney U test was used to compare different groups. Utilizing the Kruskal-Wallis test, the categories of the DISCERN, JAMA, and GQS scoring systems were combined. This test was also used to compare video parameters involving more than two independent variable groups. The ‘excellent’ category of YouTube videos and the ‘good’ category of TikTok videos were excluded from the comparison since there was only one observation from each of these categories. For correlation analysis Spearman test was performed. “P” values less than 0.05 indicated statistical significance for the obtained results.

RESULTS

A total of 108 videos on TikTok and 78 videos on YouTube were reviewed after the inclusion and exclusion criteria were applied, and the remaining 50 eligible videos on each platform were included in the study (Figure 1).

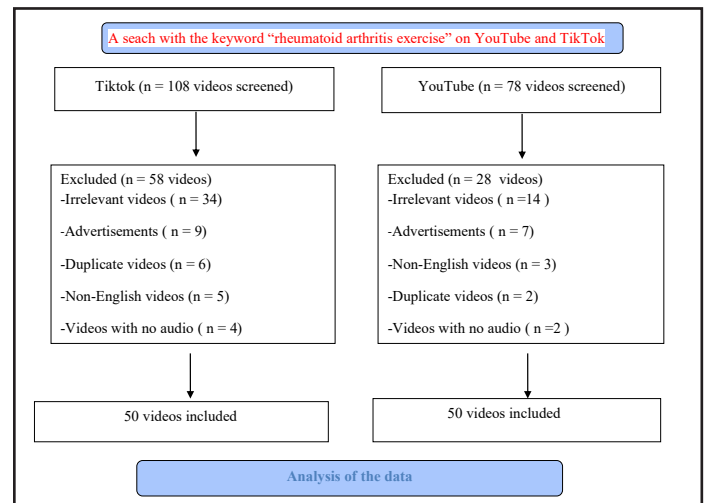


Figure 1. Flowchart of the selection of TikTok and YouTube videos.

In Table 1, the video features were displayed. When comparing YouTube to TikTok videos, there was a significant difference in the likelihood that the former would receive high DISCERN reliability, quality, and overall scores (21,5(11) vs. 15(6), 15(9) vs. 9(4), and 40,5(21) vs. 28(9), $p < 0.001$, respectively). Similarly, YouTube videos had a higher GQS scores that 12 videos (24%) on YouTube and 2 videos (4%) on TikTok were in the high-quality group ($p < 0.001$). Additionally, there was a statistically significant difference in the JAMA scores between TikTok and YouTube videos (2(1) vs. 1(1), $p < 0.001$). When DISCERN classification scores were evaluated, for YouTube videos, 18% were classified as “very poor,” 26% as “poor,” 34% as “fair,” 20% as “good,” and 2% as “excellent,” while for TikTok videos, 46% were classified as “very poor,” 36% as “poor,” 16% as “fair,” 1% as “good,” and 0% as “excellent” ($p < 0.01$). The median video length of the YouTube videos were significantly longer than TikTok videos (12.12 minutes vs. 0.42 minutes, $p < 0.001$). YouTube videos had also more view count (35438 vs. 5989, $p < 0.001$), like count (871.5 vs. 199, $p < 0.001$), annual comments (36.5 vs. 5, $p < 0.001$) and more followers (86050 vs. 16100, $p < 0.01$) when compared to TikTok videos. YouTube videos uploaded by physicians were significantly higher from TikTok videos (34% vs. 14%, $p < 0.001$). On the other hand, patients and

websites/organizations related to health uploaded more TikTok videos (24% vs. 8% and 18% vs. 4%, $p=0.003$, respectively). The overall quality of YouTube videos were found to be higher on YouTube videos compared to TikTok videos (33 (66%) vs. 12 (24%), $p<0.0001$). Besides, daily viewing rate and VPI were higher on YouTube videos than TikTok videos (47161,04 vs. 11090,68, $p=0.005$ and 399085,19 vs. 50752,32, $p=0.03$).

Table 2 displays the DISCERN classification based on the video features. The findings showed that, in terms of overall safety according to DISCERN categories, there was a statistically significant difference between videos from TikTok and YouTube ($p<0.001$). We found a significant higher overall quality of treatment according to the DISCERN categories ($p<0.001$) on both social media platforms. Furthermore, we demonstrated a significant difference between the groups regarding the

broadcast’s overall quality based on the DISCERN categories and there was a noticeable variance in the quality of TikTok videos among different groups based on the DISCERN categories ($p<0.001$). When compared to JAMA scores according to DISCERN categories, we showed a statistically significant difference on YouTube and TikTok videos ($p<0.001$).

The correlation between the JAMA, GQS, DISCERN scoring systems and the number of views, like, daily viewing rate, daily like rate and VPI of YouTube videos is presented in Table 3. There was a statistically significant and positive correlation between the scores and like count, daily VPI and viewing rate. Contrarily, no correlation was found between scoring systems and the number of views, like, daily viewing rate, daily like rate and VPI of TikTok videos (Table 4).

Table 1. Comparison of the YouTube and TikTok video features.

	YouTube (n=50)	TikTok (n=50)	P
	Median (IQR) or n (%)	Median (IQR) or n (%)	
Discern Part 1	21,5 (11)	15 (6)	0,0001* ¹
Discern Part 2	15 (9)	9 (4)	0,0001* ¹
Discern Part 3	3 (2)	2 (1)	0,0001* ¹
Overall DISCERN Score	40,5 (21)	28 (9)	0,0001* ¹
DISCERN Category			
Very Poor	9 (18)	23 (46)	0,001** ²
Poor	13 (26)	18 (36)	
Fair	17 (34)	8 (16)	
Good	10 (20)	1 (2)	
Excellent	1 (2)	0 (0)	
GQS Criteria			
Low quality	12 (24)	30 (60)	0,0001** ²
Medium quality	26 (52)	18 (36)	
High quality	12 (24)	2 (4)	
JAMA Criteria	2 (1)	1 (1)	0,0001* ¹
Video length (min.)	12,12 (14,84)	0,42 (0,71)	0,0001* ¹
Video upload time (month)	27 (31)	14,5 (17)	0,0001* ¹
View count	35438 (183043)	5989 (11749)	0,0001* ¹
Comment count	76,5 (173)	9 (15)	0,0001* ¹
Number of comments per year	36,5 (86,75)	5 (11,13)	0,0001* ¹
Like count	871,5 (3012)	199 (442)	0,001* ¹
Number of followers	86050 (443710)	16100 (48700)	0,001* ¹

Uploaders			
Physician	17 (34)	7 (14)	0,003**2
Non-physician health worker	11 (22)	7 (14)	
Patient	4 (8)	12 (24)	
Health-related organizations/websites	2 (4)	9 (18)	
Trainer	9 (18)	3 (6)	
Others	7 (14)	12 (24)	
Videos Quality			
Low	4 (8)	5 (10)	0,0001**2
Medium	13 (26)	33 (66)	
High	33 (66)	12 (24)	
Daily viewing rate	47161,04 (180071,27)	11090,68 (30012,61)	0,005*1
Daily like rate	1181,3 (3052,46)	438,75 (1035,06)	0,135
Daily VPI (Video Power Index) (%)	399085,19 (6803583,92)	50752,32 (425734,53)	0,03*1
Monthly comment rate	2,79 (5,63)	0,43 (1,31)	0,002*1

*: median (interquartile range (IQR)), **: n (%) ¹ Mann Whitney U test, ² Pearson Chi-square test

Table 2. Comparison of all parameters of videos on both platforms according to DISCERN evaluation categories

DISCERN Score Category		Very Poor Median (IQR) or n (%)	Poor Median (IQR) or n (%)	Fair Median (IQR) or n (%)	Good Median (IQR) or n (%)	Excellent Median (IQR) or n (%)	p
Number of videos	YouTube	9 (18)	13 (26)	17 (34)	10 (20)	1 (2)	0,001*1
	TikTok	23 (46)	18 (36)	8 (16)	1 (2)	0 (0)	
Discern Part 1	YouTube	14 (4)	17 (4)	24 (5)	30 (3)	-	0,0001**2
	TikTok	12 (3)	17 (2)	24,5 (2)	-	-	0,0001**2
Discern Part 2	YouTube	8 (2)	12 (3)	17 (3)	21,5 (3)	-	0,0001**2
	TikTok	8 (1)	9,5 (2)	14 (2)	-	-	0,0001**2
Discern Part 3	YouTube	2 (1)	3 (1)	3 (1)	4 (0)	-	0,0001**2
	TikTok	2 (1)	2,5 (1)	2,5 (1)	-	-	0,0001**2
Overall DISCERN Score	YouTube	24 (6)	30 (7)	44 (7)	54,5 (4)	-	0,0001**2
	TikTok	21 (5)	29 (1)	39,5 (5)	-	-	0,0001**2
JAMA Criteria	YouTube	1 (1)	2 (0)	3 (1)	3 (1)	-	0,0001**2
	TikTok	1 (1)	2 (1)	2 (1)	-	-	0,0001**2
Video length (min.)	YouTube	3,36 (3,82)	8,24 (11,4)	17,06 (10,96)	18,3 (10,6)	-	0,0001**2
	TikTok	0,43 (0,7)	0,36 (0,8)	0,415 (0,28)	-	-	0,994 ²
Video upload time (month)	YouTube	55 (64)	29 (42)	22 (18)	19 (25)	-	0,025**2
	TikTok	13 (16)	18 (18)	16 (22)	-	-	0,659 ²
View count	YouTube	31632 (107770)	23481 (173556)	41780 (224079)	56395 (418885)	-	0,828 ²
	TikTok	5553 (14236)	5889 (22059)	7619,5 (8632)	-	-	0,799 ²

Comment count	YouTube	22 (114)	34 (84)	84 (193)	180,5 (186)	-	0,057 ²
	TikTok	9 (14)	8,5 (19)	5 (38)	-	-	0,966 ²
Number of comments per year	YouTube	7,33 (32,53)	8,25 (71)	42,33 (155,75)	75,665 (163,97)	-	-
	TikTok	5 (10,5)	5,08 (18,25)	4,5 (11,12)	-	-	0,926 ²
Like count	YouTube	504 (868)	529 (2511)	1000 (3313)	1150 (5239)	-	0,257 ²
	TikTok	191 (410)	156 (449)	256 (736)	-	-	0,501 ²
Number of followers	YouTube	189000 (2335761)	125000 (331350)	53100 (525800)	21100 (281748)	-	0,85 ²
	TikTok	13700 (57347)	12874,5 (45979)	16100 (119972)	-	-	0,742 ²
Daily viewing rate	YouTube	17253,8182 (43586,84)	50698,8462 (341225,98)	50136 (194713,39)	85796,0337 (243487,45)	-	0,282 ²
	TikTok	13222,2222 (59580)	9173,8636 (55024,09)	10906,1818 (21801,19)	-	-	0,647 ²
Daily like rate	YouTube	321,7021 (795,33)	245,2174 (3416,77)	1411,875 (3918,01)	1660,5319 (3507,52)	-	0,057 ²
	TikTok	480 (1329)	288,1579 (1313,41)	509,9561 (592,79)	-	-	0,349 ²
Daily VPI (Video Power Index) (%)	YouTube	62772,5276 (349310,54)	77364,4893 (18691471,29)	535774,72 (8978790,65)	1338203,539 (10511405,92)	-	0,089 ²
	TikTok	55171,875 (1030914,7)	23253,618 (939319,27)	75498,8388 (231412,28)	-	-	0,362 ²
Monthly comment rate	YouTube	0,4681 (2,58)	0,6346 (5,97)	3,8485 (8,73)	4,8356 (11,93)	-	0,017** ²
	TikTok	0,5 (1)	0,4114 (1,7)	0,3868 (1,04)	-	-	0,712 ²

*: n (%), **: median (interquartile range (IQR))¹ Pearson Chi-square test, ² Kruskal Wallis test

Table 3. Correlation between JAMA, GQS, DISCERN scoring systems and YouTube video characteristics.

	DISCERN (r; p)	GQS (r; p)	JAMA (r; p)
Number of views	0,194; 0,177	0,238; 0,095	0,149; 0,303
Like	0,379; 0,007**	0,397; 0,004**	0,293; 0,039*
Daily viewing rate	0,353; 0,012*	0,353; 0,012*	0,258; 0,071
Daily like rate	0,481; 0,0004**	0,442; 0,001**	0,332; 0,019*
Daily Video Power Index	0,441; 0,001**	0,421; 0,002**	0,31; 0,029*

r: Spearman’s rho correlation coefficient

Table 4. Correlation between JAMA, GQS, DISCERN scoring systems and TikTok video characteristics.

	DISCERN (r; p)	GQS (r; p)	JAMA (r; p)
Number of views	0,027; 0,85	0,007; 0,96	-0,038; 0,795
Like	-0,015; 0,916	-0,04; 0,785	-0,094; 0,517
Daily viewing rate	-0,02; 0,891	-0,093; 0,522	-0,123; 0,394
Daily like rate	-0,03; 0,838	-0,116; 0,424	-0,186; 0,197
Daily Video Power Index	-0,008; 0,958	-0,089; 0,537	-0,15; 0,3

r: Spearman’s rho correlation coefficient

DISCUSSION

This is the first study to assess the quality, accuracy and video-specific characteristics of YouTube and TikTok videos about RA exercises in the literature. We observed that the quality and accuracy of health information on RA exercises videos is higher on YouTube than on TikTok platform. Moreover, YouTube videos produced by physician were more common. On the other side, TikTok videos had more uploads by health-related organizations/websites and patients.

According to various studies, social media has emerged as a crucial platform for the sharing and exchange of health-related information on a wide range of subjects, and the use of the Internet for health information is growing [8,9,23]. However, given the rapid spread of misinformation on these social media platforms, It is critical to assess the reliability and quality of health-related content on these platforms [24]. Numerous earlier research have looked into social media videos as a source of high-quality health information, with varying degrees of success. For instance, Zengin et al. [25] used the DISCERN and GQS scoring systems to analyze the information quality of musculoskeletal ultrasound videos on YouTube. They found that 40.1% of the videos were of low quality, 20.4% were of moderate quality, and 39.5% were of high quality. In a similar vein, Ozsoy-Unubol et al. [26] discovered that most fibromyalgia-related YouTube videos are of low quality. Some studies report higher rates of high quality videos on YouTube than these studies do. Rodriguez-Rodriguez et al. [27] analyzed 150 YouTube videos and investigated the video popularity, reliability and quality of information using the DISCERN Scale and GQS. They showed that the pelvic floor exercises that are advised following prostatectomy surgery are covered in high-quality YouTube videos. Another social media platform that has gained popularity as a source of health information is TikTok [12]. Some recent studies have reported the quality of health information on both TikTok and YouTube social media platforms. In this regard, Song et al. [16] stated that TikTok and YouTube videos about gender-affirming surgery ranged from poor to average reliability and quality. In another study by Babar et al. [28] analyzed the first 50 videos on YouTube and TikTok regarding erectile dysfunction treatment and compared the quality of information on each platform. They found that although the quality of the videos on YouTube was higher than that of TikTok, a sizable portion of the content was erroneous. Özkent et al. [15] also examined women urinary incontinence videos on TikTok and YouTube. They discovered that low

quality video content from both health care and nonhealth care professionals was available on these platforms; with the median DISCERN score of the videos being higher on YouTube than on TikTok (38 vs. 26). These studies' findings, YouTube videos had a higher likelihood of having higher DISCERN and GQS scores than TikTok videos, are supported by our research.

Based on the findings of our investigation, it was discovered that, in comparison to TikTok videos, YouTube videos had longer durations, more likes, views, and comments. 44% of videos on YouTube and 82% of videos on TikTok were classified as extremely poor or poor quality, respectively, based on the DISCERN classification system. In addition, these videos' scores on YouTube for DISCERN, GQS, and JAMA were substantially higher than those on TikTok. This might be because TikTok videos are shorter than other platforms, which makes it harder to describe the content of videos in greater detail. Because the health care providers uploaded the videos, high-quality ones were more likely to have trustworthy information.

Our study offers that, YouTube videos provide an opportunity to share high-quality information on RA exercise with a large audience. Therefore, it is necessary to provide reliable and understandable videos to viewers created by healthcare professionals. As video sharing websites become an increasingly used source of health-related information, physicians should give messages to patients about obtaining health information from these platforms.

Limitations

One of the limitation of this study is the usage of DISCERN instrument and GQS scoring system that may be associated with observer bias. Another limitation of our study was a cross-sectional analysis that may have provided different results due to the analyzing of most relevant videos at a single time point. Lastly, we only searched one term "rheumatoid arthritis exercise", but the results may have changed if we have added more terms. The other limitation of this study was that we did not look beyond the videos on the first three pages of search pages, that might have provided better understanding of the role of reliability and quality of the videos. Although the two popular social media platforms were included in the study, it would have been better to include the other video-sharing platforms.

CONCLUSIONS

In conclusion, our findings highlight that RA exercises video

contents on YouTube are more likely to have higher quality and accuracy than TikTok social media platform. Besides, videos produced by physicians were more prevalent on YouTube videos. We consider that it is important to provide videos by healthcare professionals to guide patients about reliable and high-quality health-related information.

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Ethical Approval: Ethics committee approval was not required as all videos were publicly available online and does not include any human participants or animals.

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