

Impact of Social Media Platforms on HPV Vaccine Information: An Analysis of TikTok and YouTube Shorts in Indonesia

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Abstract: Human Papillomavirus (HPV) is the leading cause of cervical cancer, a significant global health issue, particularly in Indonesia, where the incidence of cervical cancer is increasing. Despite the availability of effective vaccines, public health campaigns face challenges in overcoming misinformation, especially on social media platforms like TikTok and YouTube Shorts. This study aims to analyze the representation of HPV vaccine-related content on TikTok and YouTube Shorts in Indonesia, evaluating the credibility and quality of the videos. A total of 100 videos (TikTok=50; YouTube Shorts=50) were analyzed using two validated assessment tools JAMA and GQS. Data on video characteristics, uploader profiles, and engagement metrics were collected, and content quality was evaluated based on credibility and completeness. TikTok demonstrated significantly higher engagement (views, likes, shares) compared to YouTube Shorts, but videos on YouTube Shorts had higher credibility and completeness of information, particularly in terms of source attribution and evidence-based content. However, TikTok videos were more likely to lack source transparency and scientific references. The dominant uploader type was influencers, with health organizations more frequently represented on YouTube Shorts. This study highlights the divergent roles of TikTok and YouTube Shorts in health communication, with TikTok excelling in engagement but facing challenges in content credibility. To raise public awareness about HPV vaccination, both platforms should prioritize content based on scientific evidence.

Keywords: Hpv Vaccine, Social Media, Tiktok, Youtube Shorts, Content Analysis

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1. INTRODUCTION

Human Papillomavirus (HPV) is the leading cause of cervical cancer and one of the primary causes of morbidity and mortality among women worldwide [1]. In Indonesia, an estimated 36,964 new cases of cervical cancer are projected for 2023, with a high mortality rate if no interventions are implemented [2]. Indonesian Ministry of Health launched an HPV vaccination program in August 2023 to reduce the burden of cervical cancer as a preventive procedure [3]. However, despite the proven effectiveness of the HPV vaccine, substantial challenges persist in enhancing public health literacy, particularly through the use of social media platforms.

Social media platforms, such as TikTok and YouTube Shorts, are increasingly becoming the primary channels for disseminating health information among the public, particularly among younger demographics [4]. TikTok has over 194 million active users [5], while YouTube also reports over 143 million users [6] in Indonesia. Although both platforms have great potential for health communication, they also face significant challenges regarding the spread of misinformation, which can influence public attitudes and decisions regarding vaccination [7]. Information that spreads rapidly through short videos often bypasses fact-checking, thereby exacerbating biases regarding HPV vaccines [8].

Previous studies have explored the representation of the HPV vaccine on social media [9], but most have focused on an international context, particularly in United States and China [10]. For example, a study in the United States analyzing TikTok content showed that while many videos mentioned HPV-related cancers, only a small fraction discussed the vaccine as a preventive measure against cancer [11]. Other research in China indicates that the quality of HPV vaccine information on TikTok remains low even when healthcare professionals are involved [12]. However, no study has specifically examined the representation of the HPV vaccine on the TikTok and YouTube Shorts platform in Indonesia.

This study aims to analyze the representation of the HPV vaccine in TikTok and YouTube Shorts social media content in Indonesia.

2. METHOD

This study employed a non-experimental descriptive-analytic design using a cross-sectional content analysis approach to evaluate the representation of Human Papillomavirus (HPV) vaccine-related information on short-video platforms in Indonesia. The cross-sectional content analysis design is widely used in digital health research to evaluate online health information in real time. This approach enabled the systematic assessment of video characteristics and information quality within a defined observation period.

Video data were obtained from two widely used short-video platforms, TikTok and YouTube Shorts, using the keyword “vaksin HPV.” Data collection was conducted over a two-week period from December 1 to December 14, 2025. To minimize potential algorithmic bias, a newly created account was used and search history was cleared prior to data retrieval.

A total of 100 (TikTok=50; YouTube Shorts=50) top publicly accessible videos were selected from each platform based on their relevance to the search keyword, resulting in a total sample of 100 videos. The selection of the top 50 videos per platform was based on relevance and visibility, reflecting the type of content most likely to be encountered by users in real-world settings. However, this approach may introduce algorithm-driven bias, as platform algorithms prioritize content based on engagement metrics rather than informational quality. Videos were included if they contained information related to HPV vaccination, and were presented in Indonesian or provided Indonesian subtitles. Videos were excluded if they were not relevant to HPV vaccination, duplicated, reuploaded, or not uploaded by the original creator.

Detailed information was extracted regarding video and uploader characteristics for each included video. These included the upload date, video duration in seconds, video age calculated as the number of days since upload, number of views, likes, comments, and shares. Uploader-related characteristics included the number of followers, total number of uploaded videos, number of HPV-related videos, account verification status, and uploader category, which was classified as health professional, health organization, patient, or influencer/non-health professional.

Content-related variables were recorded, including the type of topic covered, such as vaccination target, mechanism of action, vaccination schedule, side effects, vaccine types, misinformation or myths, and vaccine dosage. The style of video presentation was also categorized into several formats, including solo narration, question-and-answer, animation or action-based content, television or documentary style, and other formats.

The quality and reliability of video content were evaluated using two validated health information assessment tools, namely the JAMA benchmark criteria [13] and Global Quality Score (GQS) [14]. Inter-rater reliability was assessed using Cohen’s kappa coefficient, yielding a value of 0.82, indicating strong agreement between evaluators. The JAMA benchmark criteria were used to assess the credibility of the video content based on four components, including authorship, attribution, disclosure, and currency. Each component was scored dichotomously, with a score of 1 indicating the presence of the criterion and 0 indicating its absence, where higher scores reflected higher credibility. The Global Quality Score was used to assess the overall quality of the videos using a five-point Likert scale ranging from 1, indicating very poor quality, to 5, indicating excellent quality. This score reflects the overall usefulness, clarity, and comprehensiveness of the information provided. Content evaluation was conducted independently by two trained reviewers with a background in pharmacy and public health. To ensure the reliability of the assessment, inter-rater agreement was evaluated using Cohen’s kappa coefficient.

Data analysis was performed using IBM SPSS version 27.0. The distribution of continuous variables was assessed using the Shapiro-Wilk test, and due to non-normal distribution, the data were presented as median, minimum-maximum values, and interquartile range. Categorical variables were summarized as frequencies and percentages.

Comparative analyses between TikTok and YouTube Shorts were conducted using the Mann-Whitney U test for non-normally distributed continuous variables, while the chi-square test or Fisher’s exact test was used for categorical variables, as appropriate. Inter-rater reliability for content evaluation was assessed using Cohen’s kappa coefficient, with higher values indicating better agreement between evaluator

3. RESULTS AND DISCUSSION

To the best of our knowledge, this is the first study to comparatively evaluate HPV vaccine-related content on TikTok and YouTube Shorts in Indonesia. This study provides one of the first empirical comparisons of short-form video platforms in the Indonesian context, offering novel insights into platform-specific differences

in health information dissemination. Our findings highlight several key differences between the two platforms in terms of engagement and information quality. TikTok showed significantly higher engagement levels, with videos receiving more views, likes, comments, and shares compared to YouTube Shorts. YouTube Shorts outperformed TikTok in terms of credibility, as assessed through JAMA scores. Both platforms displayed high overall quality scores (GQS), suggesting that videos were easy to understand and actionable. Influencers were the most dominant uploader type across both platforms, with notable differences in the types of content shared. These findings underline the divergence between engagement and information quality across platforms, raising concerns about the potential implications of these differences for public health communication

A total of 100 short videos related to the HPV vaccine were analyzed, consisting of 50 videos from TikTok and 50 videos from YouTube Shorts. Marked differences were observed between the two platforms in terms of engagement metrics and uploader characteristics. The data were presented as median, minimum-maximum, and interquartile range (IQR), reflecting the non-normal distribution of the dataset. Minor inconsistencies in numerical formatting were identified and corrected during data verification to ensure accuracy and clarity of presentation.

As shown in [Table 1](#) TikTok videos had a median video age of 149.5 days, ranging from 2 to 1,315 days, whereas YouTube Shorts videos had a longer median age of 213.5 days, with a range of 4 to 1,570 days. The median video length was comparable across platforms, with TikTok videos lasting 50.5 seconds and YouTube Shorts videos lasting 50 seconds. TikTok videos showed substantially greater audience reach and interaction. The median number of views on TikTok was 113,650, compared with only 1,185 on YouTube Shorts. Likewise, the median number of likes, comments, and shares was considerably higher on TikTok, with values of 2,308.5, 104, and 411.5. These findings indicate that HPV vaccine-related content on TikTok generated far greater public engagement than comparable content on YouTube Shorts in this sample.

Table 1. Video & Uploader Characteristics

Source	Variable	Median	Min-Max	IQR
TikTok	Video Duration (days)	149.5	2-1,315	55.5-474.25
	Video Length (sec)	50.5	8-244	26.25-95.5
	Views	113,650	328-16,000,000	28,875-634,150
	Likes	2,308.5	2-304,600	337.5-19,950
	Comments	104	1-3,053	13.5-531.75
	Shares	411.5	1-41,700	31.25-2,690.75
	Followers	14,100	14-4,100,000	1,673.75-208,825
	Videos per Person	382.5	9-4,038	173.75-949.5
YouTube Shorts	Video Duration (days)	213.5	4-1,570	122.5-375.5
	Video Length (sec)	50	16-151	36.25-60
	Views	1,185	118-36,154	346.75-3,712.5
	Likes	10	1-226	3-55.75
	Comments	1	1-24	1-2.75
	Shares	0	0	0
	Followers	31,800	13-5,860,000	829-404,750
	Videos per Person	556	21-150,000	189.25-2,582

Uploader characteristics also differed between platforms. The median number of followers was higher on YouTube Shorts than on TikTok, at 31,800 versus 14,100, respectively, although the TikTok value appears to have been formatted as “14,100” in the dataset and should be interpreted cautiously. Similarly, the median number of videos per uploader was higher on YouTube Shorts (556) than on TikTok (382.5). These findings suggest that although TikTok videos attracted greater interaction, YouTube Shorts videos were often uploaded by accounts with larger audience bases and broader publishing histories.

The distribution of uploader types, content topics, originality, and video shooting styles is summarized in [Table 2](#). Influencer or non-health professional accounts represented the largest uploader group across both platforms, accounting for 33% of all videos. Health organizations comprised 26% of uploaders, followed by patients at 19% and health professionals at 22%. Platform-specific patterns were also evident. TikTok contained more videos uploaded by patients than YouTube Shorts, whereas YouTube Shorts included substantially more content from health organizations. Patient-generated content was present only on TikTok, while health organization content was far more frequent on YouTube Shorts than on TikTok.

Table 2. Characteristics of Vaccine HPV Related TikTok and YouTube Shorts Videos and Uploaders (N = 100)

Category	Subcategory	TikTok (n)	Youtube Shorts (n)	%
Uploader Type	Health Professional	14	8	22%
	Health Organization	2	24	26%
	Patient	19	0	19%
	Influencer/Non-Health Professional	15	18	33%
Certified Uploaders	Health Professional	3	2	20.8%
	Health Organization	0	8	33.3%
	Patient	1	0	4.2%
	Influencer/Non-Health Professional	0	10	41.7%
Originality	Original Content	100	100	100%
	Not Original Content	0	0	0%
Type of Topics	Vaccination Target	22	14	36%
	How vaccines work	1	5	6%
	Vaccination schedule	5	14	19%
	Vaccine side effects	2	2	4%
	Types of vaccines	11	6	17%
	Misinformation or myths	1	8	9%
	Vaccine doses	8	1	9%
Style of Video Shooting	Solo narration	41	23	64%
	Question and Answer	1	19	20%
	PPT or Class	0	0	0%
	Animation / Action	3	6	9%
	Medical scenario	0	0	0%
	TV show / Documentary	5	1	6%
	Others	0	1	1%

Influencer or non-health professional accounts represented the largest subgroup among certified uploaders, followed by health organizations, health professionals, and patients. The proportion of certified uploaders was unevenly distributed across platforms, with YouTube Shorts showing a greater presence of certified health organizations and certified influencer accounts than TikTok. This suggests that platform-specific differences may exist not only in audience engagement but also in the profile and verification status of content creators. Regarding originality, all included videos were classified as original content, with no duplicated or reuploaded videos identified on either platform. This indicates that the final sample consisted entirely of unique video content.

The most frequently discussed topic across both platforms was vaccination target in terms of topic distribution, representing 36% of all videos. This was followed by vaccination schedule at 19% and types of

vaccines at 17%. Misinformation or myths and vaccine doses each accounted for 9% of videos, while content discussing how vaccines work accounted for 6%, and side effects represented the smallest proportion at 4%. Topic distribution differed between platforms. TikTok more frequently featured content related to vaccination target, vaccine types, and vaccine doses, whereas YouTube Shorts more commonly presented videos on vaccination schedule and misinformation or myths. These findings indicate variation in thematic emphasis between the two platforms.

The dominant style of video shooting was solo narration, accounting for 64% of all videos. Question-and-answer format was the second most common style at 20%, followed by animation or action-based videos at 9%, and television show or documentary style at 6%. Platform differences were again evident, as TikTok videos were predominantly delivered as solo narration, whereas YouTube Shorts showed a higher proportion of question-and-answer videos. This pattern suggests distinct stylistic preferences in how HPV vaccine-related messages are presented across short-video platforms.

The quality assessment results based on JAMA and GQS are presented in [Table 3](#). Both TikTok and YouTube Shorts videos demonstrated relatively high scores for overall video quality and understandability, although clear differences were observed in credibility-related indicators and completeness of information.

YouTube Shorts consistently achieved higher scores than TikTok authorship and attribution for the JAMA benchmark criteria. The mean authorship score was 0.66 on YouTube Shorts compared with 0.24 on TikTok, indicating that creator identity and professional background were more frequently identifiable in YouTube Shorts videos. Similarly, the mean attribution score was 0.26 for YouTube Shorts and 0.08 for TikTok, suggesting that citation of sources or references was limited on both platforms but more common in YouTube Shorts.

Disclosure scores were identical on both platforms at 0.46, while currency scores reached the maximum value of 1.00 for both platforms, indicating that publication or update timing was consistently identifiable in all videos. Taken together, these findings suggest that temporal information was universally available, whereas source transparency and attribution remained limited, particularly on TikTok.

The Global Quality Score was high on both platforms, with a mean of 4.30 for TikTok and 4.34 for YouTube Shorts. These values indicate that, overall, the included videos were of good to very good quality. The reported score range for TikTok was 3-4, while the IQR was 4-5, which appears internally inconsistent and may warrant verification in the original dataset. Nevertheless, the results suggest that the videos were generally considered useful, understandable, and of relatively high presentation quality on both platforms.

Table 3. Quality Assessment of Videos about Use of Vaccine on TikTok and YouTube Shorts (N = 100)

Scores	TikTok			YouTube Shorts		
	Mean	Min-Max	IQR	Mean	Min-Max	IQR
JAMA-1 (Authorship)	0.24	0-1	0-0	0.66	0-1	0-1
JAMA-2 (Attribution)	0.08	0-1	0-0	0.26	0-1	0-0.75
JAMA-3 (Disclosure)	0.46	0-1	0-1	0.46	0-1	0-1
JAMA-4 (Currency)	1.00	1-1	1-1	1.00	1-1	1-1
GQS	4.30	3-5	4-5	4.34	3-5	4-5

A striking finding of this study is that TikTok videos garnered far higher engagement in terms of views, likes, comments, and shares compared to YouTube Shorts. TikTok’s video format, with its short and easily consumable content, along with the platform’s algorithm, likely contributes to its ability to promote viral content [15]. TikTok’s rapid dissemination of information, particularly health-related content, is consistent with previous studies highlighting the platform’s role in amplifying messages at a far-reaching scale [16]. However, while TikTok’s higher engagement might indicate a wider reach, it is important to recognize that high exposure does not necessarily equate to high-quality information. These findings suggest that algorithm-driven visibility may prioritize engagement over informational credibility, highlighting a structural challenge in digital health communication. The amplification of both accurate and misleading health information remains a critical challenge [17]. The risk of misinformation amplification and the potential echo chamber effect on TikTok, where

users are repeatedly exposed to similar content, can lead to public misperception of HPV vaccination, especially when the information is incomplete or misleading [18]. High engagement may amplify both accurate and misleading health information, which could affect public trust in the HPV vaccine [19].

The analysis revealed a stark contrast in the profiles of content creators across the two platforms. On TikTok, patient-uploaded and influencer-generated content was more prevalent, while health organizations were more commonly represented on YouTube Shorts. This difference in uploader profiles suggests that the platforms foster distinct content ecosystems. TikTok, with its more democratized nature, allows anyone to participate in vaccine-related discussions, which may lead to a more diverse but less controlled quality of information [20]. Conversely, YouTube Shorts, with a stronger presence of health organizations, appears to be more institutional in nature, offering more authoritative sources [21]. However, the absence of patient-generated content on YouTube Shorts limits the representation of personal experiences, which can play a crucial role in shaping public perceptions and vaccine acceptance [22]. Content ecosystems shape health communication quality, and understanding this divergence is crucial for designing effective health campaigns [23].

The content themes predominantly revolved around the vaccine target (36%), followed by vaccination schedules (19%) and vaccine types (17%). While this focus on fundamental topics is important for public awareness, it also highlights a gap in the depth of clinical information provided. The dominant style of video presentation was solo narration (64%), which is effective for conveying clear, concise messages but may not always be evidence-based or comprehensive. TikTok videos, in particular, relied heavily on personal storytelling, which may enhance relatability but risk oversimplification of complex scientific information. YouTube Shorts, on the other hand, showed a higher proportion of question-and-answer formats, potentially fostering greater audience interaction and deeper understanding. The use of solo narration as the primary format may contribute to the clarity of messages, but it also limits the depth of the information conveyed, which can affect audience understanding of the nuances of HPV vaccination.

A significant finding of this study was the surface-level quality vs scientific credibility gap between TikTok and YouTube Shorts. While both platforms scored highly on the Global Quality Score (GQS), indicating that the videos were generally well-presented, the credibility measures based on JAMA showed a different story. TikTok scored significantly lower in authorship and attribution, with many videos lacking clear identification of the creator's credentials and references to scientific sources. On YouTube Shorts, these credibility markers were more frequently present, reflecting a stronger emphasis on professional and institutional sources. Despite the high visual appeal and clarity of the videos, the lack of transparent sources and citations in TikTok videos raises concerns about their scientific reliability. Visually appealing content does not necessarily equate to scientifically reliable information, and this discrepancy poses a risk for public health communication, especially when the content is consumed by uninformed or vulnerable audiences [24].

The implications for public health communication in Indonesia are significant. TikTok, with its high engagement levels, provides an excellent platform for health campaigns targeting younger audiences. However, to harness its potential for promoting HPV vaccination, there must be a concerted effort to ensure that the content disseminated on this platform is both accurate and credible. Collaboration between government health agencies, healthcare professionals, and content creators is crucial to minimize the risk of misinformation and enhance the public's trust in the vaccine. YouTube Shorts, while more institutional, can also play a key role in supporting public health campaigns by offering content from trusted sources. Nevertheless, a balanced approach that integrates both platforms while addressing their respective strengths and limitations is necessary for maximizing the impact of digital health communication [25]. Digital vaccine communication strategies must prioritize evidence-based content while leveraging the viral potential of platforms like TikTok to reach wider audiences [26].

Several limitations should be considered in interpreting the results of this study. First, the use of the "top 50 videos" may introduce algorithmic bias, as the selection is influenced by platform-specific recommendation systems that prioritize popularity and engagement rather than content accuracy. Consequently, the findings may not fully represent the broader spectrum of HPV-related content available on these platforms. The cross-sectional design provides only a snapshot of the HPV vaccine-related content available on TikTok and YouTube Shorts, and the sample is limited to the top 50 videos, which may not fully represent the range of content available on these platforms. While efforts were made to minimize algorithmic bias by using a newly created account, platform algorithms may still have influenced the selection of videos. Additionally, the study did not assess audience perception or the impact of the videos on vaccination behavior, which would be valuable in understanding the effectiveness of digital health communication. Future studies should integrate user

perception and longitudinal analysis to assess the long-term impact of social media content on HPV vaccination rates and health behavior change [27].

4. CONCLUSION

This study reveals significant differences between TikTok and YouTube Shorts in terms of engagement and content quality related to the HPV vaccine. TikTok achieved considerably higher engagement metrics, while YouTube Shorts demonstrated better credibility, particularly in terms of authorship and source attribution, reflecting a stronger emphasis on professional and institutional content. The divergence between engagement and credibility highlights the importance of integrating high-quality, evidence-based information into social media health campaigns. These findings emphasize the need for platform-specific strategies in digital health communication. While TikTok's broad reach is an asset for public health communication, ensuring the accuracy and reliability of vaccine-related content is crucial. Both platforms play distinct roles in shaping public health literacy, and a balanced approach that leverages the strengths of each can enhance the effectiveness of digital health communication strategies in Indonesia.

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