



## Misleading Tobacco Content is on the Rise on YouTube

A content analysis of popular videos on YouTube containing tobacco-relevant material revealed five categories of misleading content about tobacco use in 2013. A re-examination in 2019 of the most heavily viewed exemplars of these categories identified in 2013 revealed a striking increase in viewership in all categories but especially in the portrayal and promotion of vaping. Because Internet sites such as YouTube are immune from responsibility for the content they host, it remains a challenge to correct or remove these videos.

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### Research question

What is the nature of misinformation about tobacco products on the video-sharing platform YouTube, and has viewership of such content, especially regarding the popularity of vaping, grown in recent years?

### Essay summary

- Misleading portrayals of the safety of tobacco is widespread on YouTube, a video-sharing platform very popular among young people.
- A content analysis of YouTube videos with tobacco themes identified five categories of misleading content on the site in 2013. These ranged from videos demonstrating how to use tobacco delivery devices without any warnings about the hazards of using the devices to messages contending that various uses of tobacco are safe despite the lack of any scientific evidence to that effect.
- A re-examination of the most popular content in the same categories in 2019 revealed dramatic increases in views per day, especially for tutorials about vaping products.
- However, misleading content was observed across several tobacco products, consistent with surveys indicating that young people use multiple tobacco products in addition to vaping.
- The easy access to such material suggests that YouTube is a fertile environment for the promotion of tobacco products despite its banning of tobacco advertising. Because YouTube is not responsible for the content of the material on its platform, it remains a challenge to

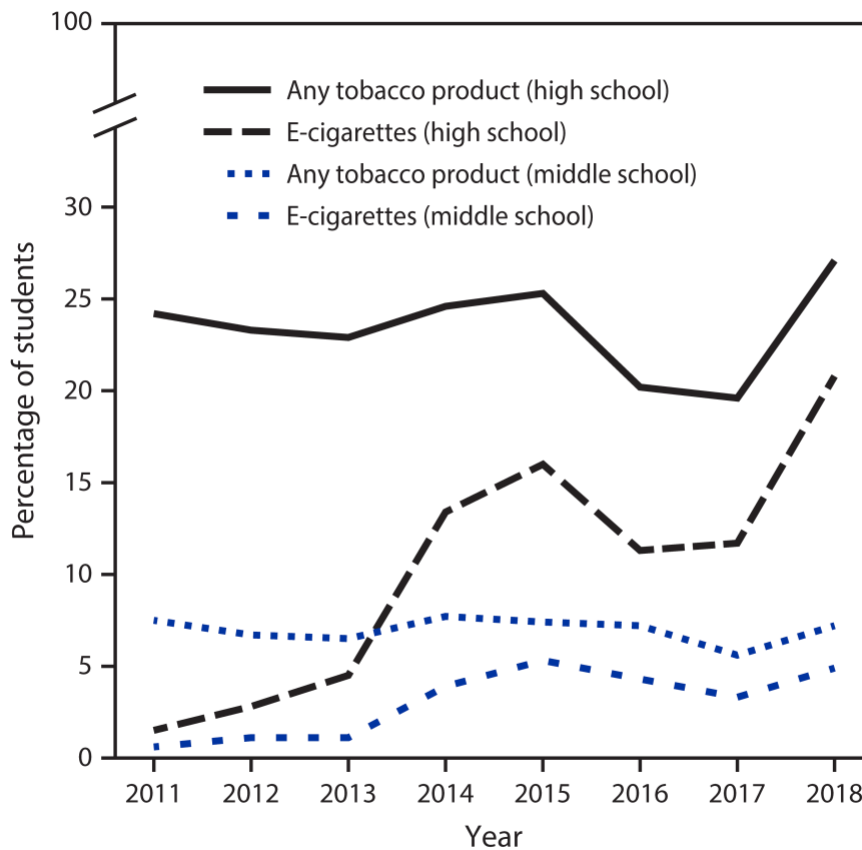
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formulate policies that can correct or remove misleading videos about tobacco products on the platform.

## Implications

YouTube is a major video-sharing platform that reaches millions of Americans and 85% of adolescents (DMR, 2019). It is second only to Google in visits in the US (Feinn, 2017). As a result, the platform has the potential to influence the information that young people receive about many topics, including those that are hazardous to health such as tobacco products (e.g., Kong et al., 2019). Although use of conventional cigarettes has declined in young people, the overall use of tobacco products has not changed (Cullen et al., 2018). Indeed, over 80% of youth who use any tobacco product also use at least one other product (Anic et al., 2018). As seen in the figure below, despite the rise of electronic cigarette use (vaping), the use of any tobacco product by middle and high school students, including smokeless tobacco, cigarettes, cigars, hookahs, has remained virtually the same in recent years. This stable group of adolescent users of tobacco is also likely to search for information about tobacco on sites such as YouTube (Bae et al., 2019), making the information on the site a likely source of influence on youth.



**Figure 1.** Percentage of middle and high school students who currently use e-cigarettes and any tobacco product--National Youth Tobacco Survey, United States, 2011-2018. Source: Cullen et al., MMWR, 2018.

The emergence of vaping as a major delivery mechanism of nicotine has raised concerns about its role in attracting youth to this form of nicotine (Navon et al., 2019). Aside from its potential harm as an inhalant

of toxic chemicals (Bhatta & Glantz, 2019), its use can encourage use of other tobacco products and potentially lead to long-term dependence on nicotine (Hair et al., 2019). Facebook [prohibits advertising](#) that promotes tobacco products. More recently, YouTube [banned videos](#) that incorporate ads for the industry. But this policy may not remove user created content that promotes the use of a tobacco product or makes unsubstantiated claims about tobacco use. In view of the wide use of the YouTube platform by young people, the potential for dissemination of misleading content about vaping on the platform is cause for concern.

Our initial search of pro-tobacco content on YouTube in 2013 found that it can take two major forms: (a) demonstrating and instructing how to use tobacco products without any warning about the potential harms of the products and (b) disseminating incorrect and misleading information about the benefits of tobacco products, such as contending that some tobacco products are safer than scientific evidence would suggest. Preliminary evidence indicates that such videos can enhance the appeal of tobacco products (Albarracín et al., 2018; Romer et al., 2017). These concerns led us to re-examine the types of misleading content about tobacco products that appeared on YouTube in 2013 with the expectation that the rise in the use of tobacco vaping by youth was paralleled by an increase in misleading content about vaping products.

Consistent with expectations, our re-examination of misleading tobacco content on YouTube in 2019 identified dramatic increases in two categories that promoted vaping products: instructional and risk management (see Tables 1 and 2 below described in the Findings). In the first category, the most watched video (i.e., highest views) demonstrates how to make a vaping device in order to do smoke tricks. For the category that promotes ways to manage the risks of inhaling tobacco, the most viewed video focuses on reducing the harms of vaping products. Yet its recommendations are based solely on the creator's personal experience. The popularity of these videos is consistent with the dramatic rise in tobacco vaping among youth as seen in the Figure above. The presence of misleading information about various tobacco products is also consistent with the widespread use of various tobacco products other than cigarettes, which have become less popular due to years of messaging about the adverse health consequences of the product.

Despite moves by major social media sites to prohibit tobacco advertising, videos that promote the use of tobacco products remain active on YouTube. The misleading-information environment on YouTube raises questions about how best to counteract such content. There is evidence that providing corrective information might be a strategy to reduce their effects (Romer et al., 2017). But how best to achieve that outcome poses other questions because it is not clearly in the financial interests of YouTube to moderate the enormous flow of information on its platform.

One disincentive for correcting misleading information is that YouTube as well as other internet content providers are shielded from responsibility for the content they house. According to Section 230 of the Communications Decency Act of 1996 (CDA), "interactive computer services" such as YouTube and other social media platforms are not regarded as the publishers of the content they provide. They may restrict content that is deemed indecent such as pornography, but they are not responsible for managing the veracity of the information that is placed on their platforms by content providers. Although the breadth of the CDA has been slowly restricted over time (Kosseff, 2016), the regulatory regime essentially removes responsibility for monitoring or controlling the information provided by the providers of content on social media sites, even harmful health misinformation.

Under the very liberal regulatory regime of Section 230, it is not clear who is responsible for protecting the public from misleading health content on the internet. As our study of YouTube illustrates, producers of misleading tobacco content can primarily represent private individuals rather than tobacco manufacturers. Indeed, the producers of the tobacco videos we identified in the Table do not appear to be employees of the tobacco industry. Although we did not see evidence of any connection to the

industry, it is nevertheless possible that a content creator could receive endorsement payments from a tobacco company.

One approach to counteracting misleading tobacco videos is to place ads that counter the information in those videos on the same page as the videos. YouTube allows advertisers to place “display ads” which are shown on the screen next to the selected video. These ads could invite viewers to learn more about the product, such as: *Things You Should Know about Vaping!* Because this advertising would ironically also benefit YouTube, the company could donate the placement of these ads as a public service. This approach could provide viewers with fact-based information that warns them about the hazards of the product despite the misleading content of the target video. If these videos were selected with sufficient frequency, they would also become part of YouTube’s recommendation algorithm for other misleading videos about tobacco products.

Placing corrective ads on YouTube raises the question as to who should pay for the production of such ads. Traditionally, The Truth Campaign and the Centers for Disease Control and Prevention have funded messages that educate the public about the hazards of tobacco. These organizations could also employ this strategy for YouTube content. At present, they have channels on YouTube that provide information about tobacco hazards, but they are not targeted to the highly viewed content we have identified. More careful targeting could help to counteract this misleading content.

Yang et al. (2019) have suggested that the government can also incentivize social media platforms to modify their terms of service to allow them to remove misleading health content without encroaching on the protections afforded by Section 230 of the CDA. However, those platforms may respond by saying that the evidence for the harm of this content has not been scientifically established. Nevertheless, the widespread presence of misleading tobacco content on YouTube suggests that this information environment promotes tobacco use by young people who are avid users of the site (Albarracín et al., 2018; Romer et al., 2017) and who are likely to be exposed to this content (Bae et al., 2019). Furthermore, the initiation of any one tobacco product is likely to be accompanied by use of other tobacco products. This evidence should spur further research by government health agencies into the effects of these videos and ways to counteract them.

## Findings

*Finding 1: We identified five categories of misleading content that had received at least 20,000 views in 2013. The same categories were evident when we conducted a follow-up search in 2019.*

- (1) Demonstrating fun ways to use tobacco, such as using vape equipment to do smoke tricks without any information about the potential ill effects of inhaling nicotine vapor or tobacco smoke;
- (2) Instructing how to assemble and use a tobacco product without any warning about the health effects of the product;
- (3) Arguing that the harms of tobacco use can be managed by various fixes (with no scientific evidence of their efficacy);
- (4) Asserting that tobacco use is actually healthy; and
- (5) Asserting that a tobacco product’s risks are no greater than, and in some cases less than, other life risks without describing the risks that the product does present (e.g., asserting that cigars are healthier than cigarettes without acknowledging the risks that cigars pose).

These misleading messages were found across six of the major tobacco products used by young people (cigarettes, smokeless, hookah, pipes, cigars, and e-cigarettes) (see Table 1 below).

*Finding 2: Demonstration and instructional videos were the most common across the products, with views in the range from 47 to 468 views per day in 2013. By 2019, daily views in these categories had increased dramatically to as high as 68 thousand per day.*

The most viewed examples of these messages from our searches in 2013 (Table 1) and 2019 (Table 2) indicated dramatic increases in views of the demonstration and instructional categories. The instructional category rose from a total count of just over 62 thousand views in 2013 for how to use a pipe to a view count of over 40 million for how to make a vape device in 2019. It is also noteworthy that across both years, misleading information was available about multiple tobacco products, including smokeless tobacco (also known as dip), cigarettes, and cigars. It is also of note that none of the videos appear to promote a specific brand of tobacco.

**Table 1.** Results of searches for misleading tobacco content on YouTube in 2013

Category	Video Title	Video Link	Views	Date Posted	Date Accessed	View Accrual
A. Modeling of Tobacco Use	FIRST DIP VIDEO & yes, im a girl (:	<a href="https://youtu.be/WeYZ6lo5mmU">https://youtu.be/WeYZ6lo5mmU</a> *	654,433	1/4/2010	11/1/2013	468 views per day
B. Tutorials	HOW TO SMOKE A PIPE Pt. 4: Should you inhale?	<a href="https://youtu.be/ZHiTnTLrwgE">https://youtu.be/ZHiTnTLrwgE</a>	62,221	4/28/2010	11/15/2013	47 views per day
C. Managing Risk	Remove FSC Chemical From Your Cigarettes	<a href="https://youtu.be/keydDPiUFg8">https://youtu.be/keydDPiUFg8</a>	85,869	1/3/2010	9/6/2013	63 views per day
D. Assertion of Benefits of Health/Wellbeing	pipe smoking and health., general discussion	<a href="https://youtu.be/zCjMu4vTi2E?t=361">https://youtu.be/zCjMu4vTi2E?t=361</a>	37,011	8/27/2009	11/15/2013	24 views per day
E. No Riskier Than	Side effects of dipping	<a href="https://youtu.be/pmAeBy6B2l4?t=440">https://youtu.be/pmAeBy6B2l4?t=440</a>	27,234	9/17/2013	10/10/2013	1184 views per day
* Video has been removed by user						

**Table 2.** Results of searches for misleading tobacco content on YouTube in 2019.

Category	Video Title	Video Link	Views	Date Posted	Date Accessed	View Accrual
A. Modeling of Tobacco Use	Peer pressuring KIDS into Dipping Tobacco	<a href="https://youtu.be/8_7nd1JMTs0">https://youtu.be/8_7nd1JMTs0</a>	1,270,454	1/28/2017	8/16/2019	1366 views per day
B. Tutorials	The Art of Vape	<a href="https://youtu.be/Sycci7rd3Lk">https://youtu.be/Sycci7rd3Lk</a>	40,021,286	1/9/2018	8/16/2019	68529 views per day
C. Managing Risk	The Real Negative Side Effects of Vaping - IndoorSmokers	<a href="https://youtu.be/9Lo4D8n59GY">https://youtu.be/9Lo4D8n59GY</a>	3,562,468	10/23/2013	8/16/2019	1678 views per day
D. Assertion of Benefits of Health/Wellbeing	Is nicotine bad for you ?	<a href="https://youtu.be/PwrXc7CedMM">https://youtu.be/PwrXc7CedMM</a>	344,696	5/15/2017	8/16/2019	418 views per day
E. No Riskier Than	Cigars vs. Cigarettes: How bad are they for you? (ft. Liga No. 10)	<a href="https://youtu.be/h6OSqgAHAJk?t=311">https://youtu.be/h6OSqgAHAJk?t=311</a>	1,005,838	4/26/2017	8/16/2019	1194 views per day

## Methods

The taxonomy was based on a search of the YouTube platform using 135 tobacco-related keywords (see Appendix) which included various common terms for tobacco use (e.g., smoking), methods of delivery (e.g., pipes, hookah, e-cigarette), tobacco brands (e.g., Marlboro, Blu), and forms of tobacco (e.g., shisha, chew). We used these terms as input to the YouTube Data API to identify relevant videos in 2013, which identified over 8,000 items with more than 20,000 views. Using a random number generator, we examined 200 unique videos for more in-depth analysis. After excluding videos without audio or in languages other than English, we used an inductive approach to classify both the visual and

spoken content into non-overlapping categories (Krippendorff, 2004). This led to the identification of five major types of misleading content that three coders were subsequently able to reliably identify within a set of 30 different videos (Krippendorff alphas > .91). Although there may have been other content that our search did not uncover, our interest was to identify the most common categories of misleading content that could be tracked over time.

Once we identified these types of content, we conducted further searches to identify the most frequently viewed examples of these categories. We used YouTube's recommendation algorithm to identify videos with the same tobacco content for each misinformation category. The algorithm has been found to produce related and highly viewed video content using prior searches of the user, especially for frequently viewed videos (Davidson et al., 2010; Zhou et al., 2010). This approach was deemed superior to using the YouTube Data API to collect videos, because the API requires a query, such as keywords, to identify results. Using the recommendation algorithm allows YouTube to identify content that might not emerge using the API. We continued this process for each category until we no longer found novel items. This enabled us to identify the most viewed video in each category at both time points. We then calculated the rate of viewing for each video in the taxonomy using the number of views divided the number of days since its appearance on the site.

There are limitations to our analysis. We cannot determine characteristics of the viewers, such as age and gender, or the number of unique viewers of each video. We also did not conduct a new search for additional misleading content in 2019. Our aim was primarily to determine whether misleading tobacco content in our categories of interest has grown since our first search in 2013 and the type of tobacco product and message that has drawn the most attention.

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### **Competing Interests**

The authors have no competing interests to declare.

### **Ethics**

The data for the project were obtained from publicly available online sources and thus were exempt from IRB review.

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