Licensed Marijuana Companies Health Claims on Twitter: Impact on the Digital Conversation and Implications for Public Health

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INTRODUCTION

More than 30 states have now legalized the use of marijuana for medicinal purposes, ushering in a large, profitable, and growing industry of marijuana companies.[1] Despite a lack of validation from rigorous clinical investigation, many marijuana companies claim their products are safe and effective treatments for serious diseases, including cancer, mental health disorders, Alzheimer's disease, and diabetes. These false and misleading claims pose a real risk to vulnerable patient populations and should be a cause for concern among state and federal policymakers and regulators. Such promotion can cause vulnerable patients to use ineffective therapies and deter or delay patients from accessing appropriate, recognized therapies. When patients facing a serious or fatal disease are misled by the industry's marketing tactics, the outcome can be catastrophic.[2]

State-by-state legalization of marijuana for medicinal purposes has created numerous intrastate marketplaces for marijuana. The federal government generally refrain from enforcing various federal laws applicable to state-sanctioned marijuana commerce, essentially allowing states to regulate their respective marketplaces.

Regulating a marijuana marketplace is a complex and difficult task for states. In many instances, states lack the resources, personnel, and expertise necessary to effectively regulate certain aspects of their marijuana market. The marketing of marijuana with therapeutic claims is one such example. While many states have adopted regulation intended to prohibit misleading therapeutic claims, they lack the resources to exercise sufficient oversight and enforcement. Numerous peer reviewed articles highlight the prevalence of unlawful and unsubstantiated marketing of marijuana products by

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1. https://www.jsad.com/doi/abs/10.15288/jsad.2022.83.5
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6348695/#:~:text=Two%20cases%20of%20sudden%20death,relied%20on%20artisanal%20cannabis%20therapies.

businesses operating in state programs.[3] As regulators have started to pay greater attention to false or misleading claims, marijuana companies have found more insidious ways to skirt regulation, imply therapeutic claims, and mislead patients.

Federal agencies such as the Food and Drug Administration (FDA) and the Federal Trade Commission (FTC) possess oversight and enforcement authorities that could stop abusive marketing of unsubstantiated therapeutic claims in state marijuana programs. However, to date, these agencies have only intervened to halt such abusive marketing tactics in the hemp market (e.g., for cannabidiol or CBD products marketed with therapeutic claims). Similar oversight or enforcement activity has not been exercised over "marijuana" businesses operating in state programs, even though many of the same marketing tactics and therapeutic claims are deployed in both markets.

Many marijuana companies marketing their dispensary products with therapeutic claims use social media platforms to disseminate their advertisements, creating further regulatory and enforcement challenges. This project aims to better understand how marijuana businesses use social media, specifically Twitter, to promulgate unlawful, unsubstantiated, and/or misleading health claims about their products. We analyze qualitatively how these claims are framed to appeal to consumer audiences and determine the reach of this messaging. We hope sharing these findings will serve as a catalyst for enhanced state and federal regulatory and enforcement action to end false and potentially harmful marketing.

THE IMPORTANCE OF THIS ANALYSIS

Since 1962, the federal Food, Drug & Cosmetic Act has required that before a product may be marketed for therapeutic use, it must undergo a rigorous evaluation of safety, quality, and effectiveness. This requirement exists under federal law to ensure consumers will not be the victims of fraud or unsafe and ineffective medications.

The requisite scientific evaluation – reviewed by the FDA – requires sponsors to generate substantial, causal evidence of safety and efficacy in adequate, well-controlled clinical studies conducted by qualified experts. This comprehensive course of study typically includes, among other things, preclinical trials to demonstrate that a drug candidate can be safely studied in humans; Phase I through III clinical investigations examining a specific drug formulation, dosing, and delivery mode in the target patient population; and various clinical pharmacology and toxicology studies that take place in addition to Phase I through III clinical trials. The results from these investigations are used to weigh whether a candidate drug's benefits outweigh its risks. Strict quality controls are also in place to ensure that

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3. https://pubmed.ncbi.nlm.nih.gov/31913671/; https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768239; https://pubmed.ncbi.nlm.nih.gov/29629505/

a drug's identity and purity are reliable and consistent throughout the development process and post-approval. FDA drug standards apply to both artificial and botanically derived drugs, as botanical compounds are not without risks.

Marijuana products sold in dispensaries have largely not undergone rigorous clinical investigation and have not been approved by the FDA. As a result, the safety and efficacy profiles of these products are not fully understood. In virtually all cases, the therapeutic efficacy of dispensary products has not been demonstrated, and a full accounting of risks has not been established. This is particularly concerning given that marijuana use has been associated with several adverse health effects, including adverse mental health outcomes,[4] cardiovascular risks,[5] risks to developing brains, and risks from use during pregnancy.[6] Nevertheless, cannabis companies aggressively market their products to vulnerable patient populations for various serious diseases.

METHODOLOGY

The research team first scraped listings from two online directories of licensed marijuana businesses – Weedmaps and Leafly (full company database is available HERE), capturing a nearly comprehensive list of licensed marijuana dispensaries in the United States. Twitter handles were obtained from company profiles and websites, and all tweets from those handles were collected (Company Corpus).

To identify marketing tactics that may warrant active oversight from FDA, the team tagged and categorized potential health-related claims from the Company Corpus of Tweets using a keyword search algorithm (see chart).

The team further identified the top 25 marijuana company Twitter accounts making the most health-related claims in the Company Corpus and analyzed how Twitter users have interacted with their content.

Top25Companies		
Company Name	**Twitter Screen Name**	**Type**
The Apothecarium CA	apothecariumca	Medical / Recreational
Ascend Retail	ascendretail	Medical / Recreational
Berkeley Patients Group	bpgtweet	Medical / Recreational
Capital City Care	capitalcitymmj	Medical
Citiva	citivallc	Medical
Cross Genetics	cross_genetics	Medical / Recreational
Curaleaf	curaleafny	Medical
curiowellness	curiowellness	Medical
Cornerstone	cw_losangeles	Medical / Recreational
Fluent Cannabis Care	fluentcannabis	Medical
Goddess Delivers	goddessdelivers	Medical / Recreational
Harvest House of Cannabis	harvesthoc	Medical / Recreational
The Botanist	iamthebotanist	Medical
Wellness Connection of Maine	mainewellness	Recreational
Mary and Main	maryandmain	Medical
Medithrive	medithrive	Medical / Recreational
Natural Herbal Pain Relief	nhpainrelief	Medical / Recreational
Reef Dispensaries	reefdispensarie	Medical / Recreational
Rise Dispensaries	riseminnesota	Medical
Surterra Wellness	surterra	Medical
Takoma Wellness	takomawellness	Medical
Texas Original	texasoriginalcc	Medical
Torrey Holistics	torreyholistics	Medical / Recreational
Treehouse Dispensary	treehouse_sc	Medical / Recreational
Marley Natural	weedadvisor1	Recreational

4. https://www.psychiatry.org/File%20Library/About-APA/Organization-Documents-Policies/Policies/Position-Cannabis-as-Medicine.pdf
5. https://www.ahajournals.org/doi/full/10.1161/CIR.0000000000000883
6. https://www.hhs.gov/surgeongeneral/reports-and-publications/addiction-and-substance-misuse/advisory-on-marijuana-use-and-developing-brain/index.html

The research team then identified the overall top ten Twitter accounts in terms of making health claims about marijuana and collected all Tweets posted on these accounts between September 2020 and August 2022 (General Corpus). The General Corpus tweets were categorized into egregious and non-egregious claims, with egregious claims being directly related to severe diseases and illnesses, including cancer, HIV/AIDS, and neurological diseases. We used the General Corpus to assess the association between FDA Warning Letters targeting the CBD-specific market and the volume of social media posts related to CBD, as well as to evaluate how the potential benefits and risks of marijuana are discussed online.

Given the risks posed to patients by misleading marketing strategies, it is important for policymakers and regulators to better understand the nature, scope, and reach of marijuana-related social media marketing. These results underscore the need for enhanced oversight and enforcement from state and federal policymakers and regulators.

	Number of Tweets
Any Topic/Condition	26333
Autism	382
Cancer	2457
Cardiovascular	162
Dermatology	66
Gastrointestinal Health	921
HIV/AIDS	433
Immunology	338
Inflammation	849
Mental Health	10491
Metabolic Syndrome	673
Neurology	395
Ophthalmology	118
Pain	9060
Rheumatology	398
Seizures	1263
Sexual Health	184
Spasticity	195
Substance Use	3663

KEY FINDINGS

FDA ENFORCEMENT

Overall, Twitter posts about CBD (General Corpus) hit a peak in the early stages of the COVID-19 pandemic, as there was significant conversation regarding the use of CBD to treat COVID-19 and other illnesses. That volume has declined since then but has remained at a steady pace of just over 1,000 egregious* health claims per month and approximately 4,000 moderate health claims per month.
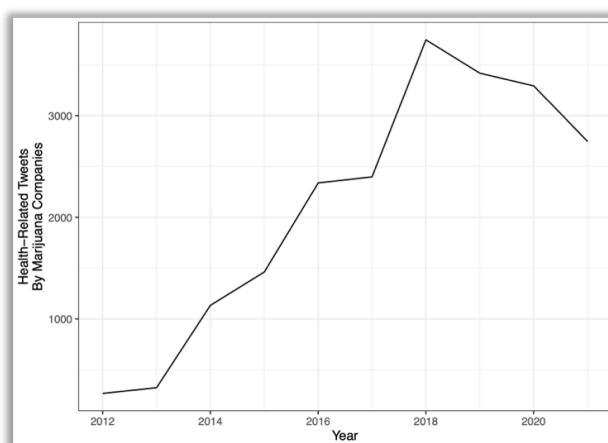
There is some evidence that the FDA's efforts to warn companies that boast unsubstantiated health claims in the CBD-specific market is associated with a reduction in Twitter posts regarding CBD health benefits. However, the association is less clear among potentially health-related Tweets from marijuana companies (Company Corpus); instead, the number of potentially health-related Tweets from marijuana companies has risen over time (see chart).

MARKETING TACTICS AND MISLEADING MESSAGES

The types of health-related marketing tactics employed by marijuana companies generally fall into three broad categories – direct claims, citing academic studies, and using consumer testimonials.

Direct Disease Claims

The analysis of marijuana company tweets (Company Corpus) identified multiple examples of marijuana companies making direct or misleading claims about the health and medical benefits of their products. Many claim that specific diseases can be mitigated, treated, or prevented using marijuana-derived treatments, including, and most commonly, cancer and depression. Some companies post leading questions that are designed to lend additional support to the false medicinal claims, such as:


- Medithrive, a San Francisco cannabis delivery service touts the "highest quality medicine" by asking the rhetorical question, "Did you know that #cannabis has been suggested as an effective #medicinal treatment for Chemotherapy Convalescence?"

- Matchbox Cannabis, "purveyors of fine cannabis products and accessories" tweeting that women in the past and until today have used cannabis for menstrual cramps, heavy periods, pregnancy, and active labor."

Invoking Academic Partnerships, Studies, or Using Scientific Terminology to Assert Credibility

The analysis also found a tendency for marijuana companies to cite academic collaborations or studies and use scientific terminology to give their assertions the aura of validity. Many of the studies cited, however, are preliminary, early-stage, or otherwise methodologically weak. The review found frequent references to academic research on how marijuana can be used to address inflammation, anxiety, cancer, and other health conditions.
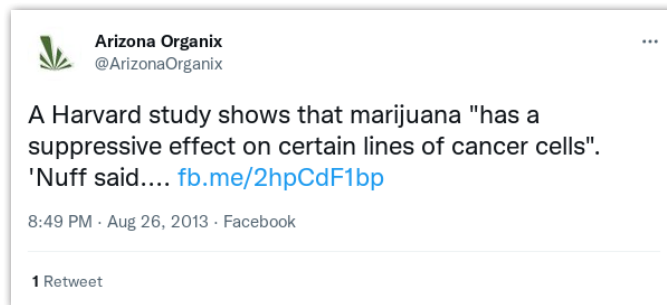
- Harvest House of Cannabis, a "medical and recreational" dispensary with locations in Arizona, Colorado, California, Pennsylvania, Florida, and Maryland, highlights a study out of Israel which followed less than 200 autism spectrum disorder (ASD) patients over a six-month period.

- Arizona Organix, the state's "first licensed medical marijuana dispensary," points to preliminary findings from Harvard laboratory and mouse studies, implying these results may demonstrate marijuana's impact on cancer patients.
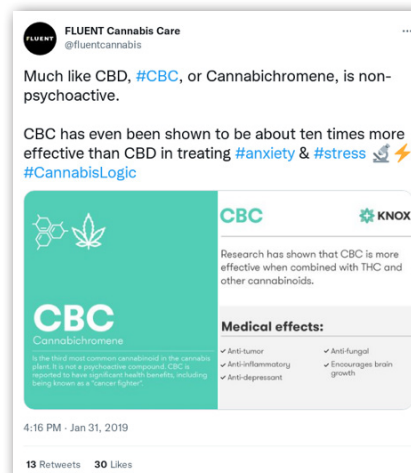

- Terrabis, a Missouri-based cannabis operator "dedicated to patient care" tweeting that prenatal exposure to marijuana does not lead to cognitive impairment in children.

- Curaleaf, a "leading medical and recreational marijuana dispensary" serving more than "350,000 registered patients across 23 states," tweets several mental health related benefits experienced by medical cannabis users.

- FLUENT Cannabis Care, which provides medical dispensaries in Florida, Pennsylvania & Texas, claims cannabichromene (CBC) has been "shown to be about ten times more effective than CBD in treating" anxiety and stress.

A study[7] released in January 2022 found that some of the largest marijuana companies establish partnerships with academic entities to legitimize health claims, even though little or little or no subsequent, meaningful clinical investigation is pursued to support those claims. Companies use collaborations with academia, related journal articles, and/or articles from external academic institutions as marketing tools to mislead the public into thinking their products have been scientifically tested and proven safe and effective. The National Consumers League study also found that marijuana companies often take preliminary scientific evidence straight to consumers and policymakers in an effort to convince them that the results are conclusive, bypassing the established FDA approval process.

Utilizing Consumer Testimonials or "Expert" Opinions

The analysis yielded multiple instances in which marijuana companies treat first-person consumer testimonials as "expert" opinions to give their health-related claims more credibility. However, consumer testimonials can be plagued by potential biases, such as coincidence, the placebo effect, and attributing cause to the wrong agent. In many cases, consumer testimonials are not corroborated by scientific investigation. Some examples include:
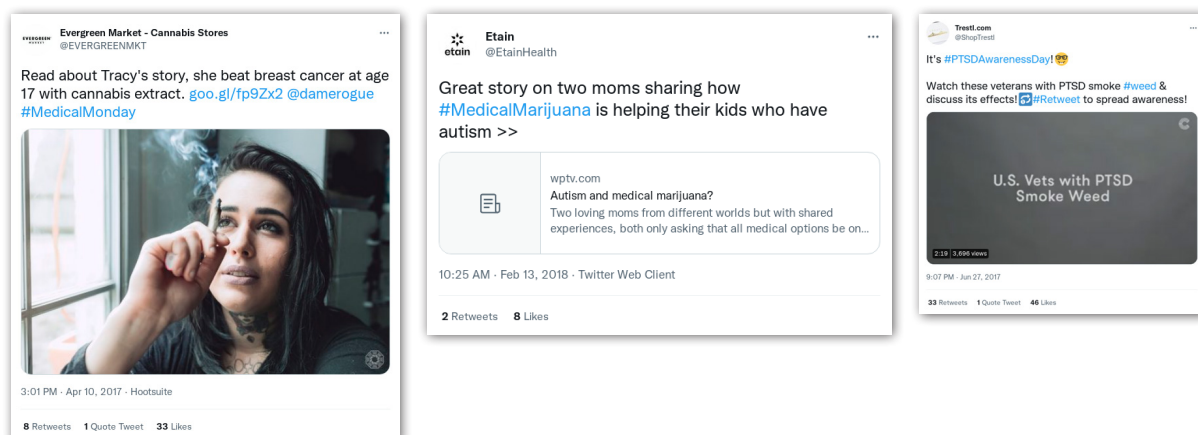
- Evergreen Market Cannabis Stores in the state of Washington urging its Twitter audience to reach about "Tracy's story" and how she beat breast cancer as a 17-year-old by using cannabis extract.

- Etain Health, a family-run, woman owned-and-operated cannabis company in New York sharing a story about marijuana helping kids with autism.

- Trestl, a California based company, shares a video of Veterans who claim marijuana has helped them battle PTSD.

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7. https://www.jsad.com/doi/abs/10.15288/jsad.2022.83.5

How Marijuana Advocates Expand the Digital Conversation

As noted earlier, the FDA can and does issue warnings to companies making false and misleading claims about the supposed health benefits of their CBD products. However, this effort to protect public health becomes more problematic when the claims are made on social media by individuals and organizations with sizeable followings and high-profile followers who can amplify their messages. Some of these individuals have ownership interests in CBD companies. NCL found in the General Corpus that, over time, the claims from these pro-marijuana Twitter accounts have become less egregious* in nature (focused on less severe health ailments such as difficulty sleeping and stress management), but they continue to promote medical benefits from marijuana-derived products with no or little clinical evidence to support them.

* Note: when analyzing the broader conversation, "egregious" claims are those that are directly related to severe diseases and illnesses, including cancer, HIV/AIDS, and neurological diseases.

John Harston

Harston is a former professional soccer player and owner of a marijuana company, Supreme CBD. Even though he is based in the United Kingdom, he has a strong social media following in the United States, much of it in the entertainment industry. He frequently references the power of CBD products to help cancer patients and those struggling with depression.

- **Followers:** Over 400,000, including Variety magazine and BBC Sport.

- **Frequency and Reach of Health Claim Tweets:** 8.44 percent of his tweets make health claims, 3.69 percent of them egregious, reaching 5.4 million Twitter users.

Cannabis Culture

This Vancouver-based marijuana retailer also publishes a magazine and circulates a web-based video program. As a social commentator, Marijuana Culture makes claims about the value of CBD and other marijuana-based products in treating disease without necessarily referring to specific products they sell. They have a strong social media following that includes news organizations and well-known influencers.

- **Followers:** Over 335,000, including Huffington Post Politics and CNBC's The Profit.

- **Frequency and Reach of Health Claim Tweets:** 5.72 percent of tweets make health claims, 3.28 percent of them egregious, reaching three million Twitter users.

NORML

NORML is perhaps the most widely known pro-cannabis advocacy organization, frequently speaking on national- and state-level cannabis policy issues. While devoting much of its social media activity to laws and regulations regarding cannabis, it also has a comparatively high percentage of moderate and egregious health claims.
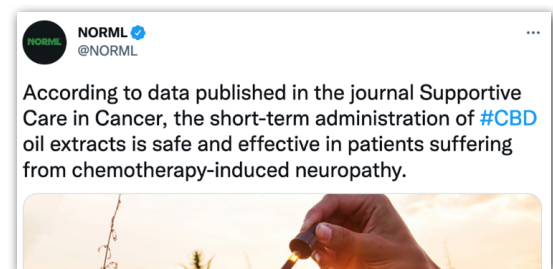
- **Followers:** Over 321,000, including Meet the Press host Chuck Todd, U.S. Senator Cory Booker, and the conservative Heritage Foundation.

- **Frequency and Reach of Health Claim Tweets:** 11.38 percent of tweets make health claims, with seven percent of them egregious, reaching 5.3 million Twitter users.

Carver Johns

Johns has built a significant social media following with his pro-cannabis perspective. He is the founder of a cannabis company and runs a website that features cannabis news and promotion of his own products. His social media stream includes many claims that cannabis-derived products can be used to treat major illnesses.

- **Followers:** Over 111,000, including CBS talk show host Sheryl Underwood and the Bipartisan Report

- **Frequency and Reach of Health Claim Tweets:** 6.25 percent of tweets make health claims, 2.59 percent of them egregious reaching 1.16 million Twitter users.

CONCLUSION AND RECOMMENDATION

The marijuana industry, through its own social media channels or via the messaging of advocates, actively claims marijuana products have a myriad of health benefits (and a dearth of risks), even though such claims are not approved by the FDA or have been validated by rigorous clinical testing. These products may provide no clinical benefit at all or, worse, cause serious harm to users' health. Nevertheless, marijuana company messages may reach and mislead potentially millions of social media users.

Marijuana companies continue to disregard federal law on the use of health claims to promote marijuana-derived products. While direct health claims still exist on social media, research shows frequent use of more subtle methods to communicate these health and wellness benefits, including citing "research", personal testimonials, suggestive hashtags, and the uses of rhetorical and leading questions is equally harmful to consumers.

These findings suggest that, in addition to enhanced enforcement of existing laws and regulations, regulators should devote more resources to monitoring social media posts from medical marijuana companies. On Twitter alone, there is a continuous flow of health claims being made that would not survive FDA scrutiny, but first the FDA must know they exist. As the state and federal regulatory landscape surrounding marijuana products becomes increasingly complex, it is imperative that state and federal regulators have the authority and resources to develop and enforce effective regulation that protects consumers.

We therefore recommend, given the magnitude of the communications taking place on social media, that the FDA begin using automated tools to monitor marijuana companies' social media posts efficiently and effectively. The warning letters on false health claims that have been issued by the FDA in recent years have had a chilling effect on the claims and health and wellness benefits these companies are making. A similar crackdown on unfounded and misleading social media posts could have a similar, pro-consumer effect.

In parallel, the FDA must expand its oversight and enforcement activities beyond the hemp market. A review of the marijuana market should be conducted, giving regulators the authority to address the breadth of misleading marijuana claims. While the agency's steps to curb misleading marketing of CBD products – including several FDA warning letters – is a promising start, the same type of unsubstantiated health claims that put consumers at risk in the hemp market also occur in state medical cannabis programs. The agency should take immediate steps to protect consumers that participate in those programs, particularly given that the risks of marijuana products could be greater than those from hemp CBD.

We recommend that Congress encourage FDA and FTC to expand their enforcement against therapeutic claims made by cannabis companies and provide the necessary resources for the FDA to conduct effective oversight of marijuana-related health claims on social media platforms.