Machine Learning Analysis for the Characterization of Vape/E-cigarette Marketing and Sales on Instagram

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Background

- In December 2019, Facebook and Instagram prohibited private sales of tobacco and vaping products on its platforms

- However, unverified users can still market potentially illicit products that can lead to online sales

- Vague company policy can lead to a robust online marketplace for unregulated vaping products

- Machine learning models are well suited to cluster Instagram posts and comments into themes related to vape marketing and sales

Objective

- To utilize a machine learning approach to identify characterize the online vaping/e-cigarette marketplace on the Instagram platform into themes relating to types of sellers, products being sold, and location of sellers

Methods

- Collect posts with specific hashtag queries using a Web Scraper

- Hashtags related to vaping: "vape", "liquid", "juice", "coil", "pen"

- Hashtags related to marketing/selling: "DM", "whatsapp", "wickr", "deliver", "telegram"

- Short-text topic modeling algorithm (Biterm Topic Model) to thematically categorize Instagram posts into clusters

Results

- After filtration and human annotation, 3,179 out of 3,841 total collected posts were relevant to vaping sales/marketing (84.3%)

- *Who is selling these products?*

- Individual and online sellers made up 50% (n = 1588) of the database, with brick and mortar stores comprising of the rest

- Individual and online sellers offer products to be purchased only through external URL, Direct Message, or offer contact information for encrypted messaging platforms to lead to offline sales

- *What products are they selling?*

- e-liquids and juices (53.6%, n = 1704), vapes (20.6%, n = 656), wholesale kits with various vaping products (2.6%, n = 83)

- *What regions are these sellers most commonly from?*

- Indonesia (50.0%, n = 1588), United Arab Emirates (18.6%, n = 591), United States (3.4%, n = 108)

Examples

GHPi
Global Health Policy Insitute
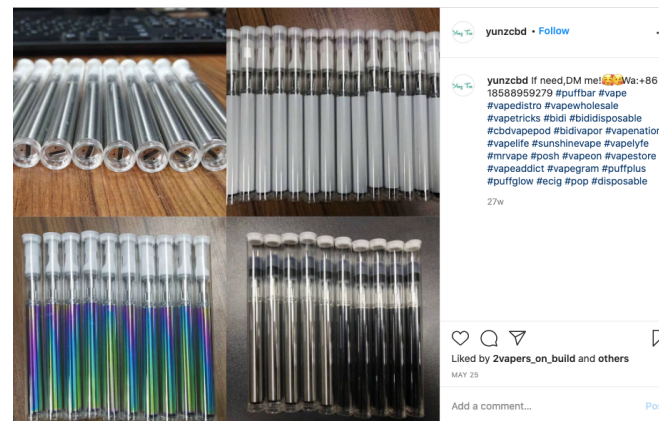
Discussion

- Biterm Topic Model in combination with hashtag queries is an effective means to target posts relating to the marketing and sales of vaping products on Instagram

- Instagram remains an avenue for the global marketplace of unregulated vaping products offered by unverified individual and online sellers

- Primary means of communication for unverified online and individual sellers to buyers is through direct messaging and encrypted messaging applications (Wickr, Kik)

- Wide array of vaping related accessories advertised on Instagram: pods, mods, coils, wholesale kits, e-liquids

- In light of EVALI outbreak in 2019-2020, it is necessary to strictly regulate the marketing and sale of vaping products on social media platforms

- Instagram and Facebook's policy must be re-evaluated to better regulate marketing/sales of vaping products on its platforms by unverified users

Future Directions?

- Examining whether the types of vaping products linked to EVALI outbreak are being advertised and sold on Instagram

- Establishing recommendations for effective and uniform regulation of marketing and sales of vaping products on Instagram

- Continuing research in social media to see if there is an unregulated vaping marketplace on other different platforms