

The Role of Tobacco Control Change Agents in Slowing the Spread of E-cigarettes in Thailand: An Analysis based on Diffusion of Innovations Theory

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Abstract

This study examines the mechanism of e-cigarette diffusion among Thai youth under the Diffusion of Innovations (DOI) framework. The objectives are to analyze factors based on DOI theory affecting the epidemic, synthesize the roles and strategies of tobacco control workers (Change Agents) in slowing the spread, and analyze related policy gaps. This is qualitative documentary research utilizing content analysis and policy analysis of policy documents, research, situation reports, and campaign media published between 2018–2024 (B.E. 2561–2567). The findings indicate that e-cigarettes possess all attributes under the DOI framework, which include relative advantage, compatibility, low complexity, trialability, and observability, which facilitate rapid adoption among youth. Change Agents, including teachers, Village Health Volunteers (VHVs), public health officers, community leaders, and local administrative organizations, play a crucial role in slowing diffusion. Their strategies include reducing the perceived advantage of e-cigarettes, reducing compatibility by creating positive identities for non-smokers, and increasing the perception of long-term harms and risks. However, operations face significant policy gaps: the gap between total ban policies and enforcement in online markets, the gap in the capacity of Change Agents, and the strategic communication gap that aligns poorly with youth media culture.

The discussion suggests that DOI theory effectively explains the diffusion of negative innovations, leading to the proposal of a “counter-diffusion strategy” to develop modern preventive measures. Recommendations include developing mechanisms to regulate online

markets, enhancing the digital competencies of Change Agents, adjusting communication strategies to be participatory and youth-led, and integrating e-cigarette control policies with national digital policies.

Keywords: E-cigarettes, Diffusion of Innovations (DOI), Tobacco Control Change Agents, Health behavior.

Background and Statement of the problem

Over the past decade, Thailand has experienced a rapid increase in e-cigarette use among children and youth, despite having strict control laws regarding import, sale, and possession (Ministry of Commerce, 2014; OCPB, 2015; Ministry of Finance, 2017). Data from the Tobacco Control Research and Knowledge Management Center (TRC) (2023) indicates that usage rates in some areas exceed 17%, reflecting a concerning epidemic level. Key factors include access via online media, "Toy Pod" product designs that attract youth, and misconceptions regarding the safety of e-cigarettes. These characteristics can be explained through Rogers' (2003) Diffusion of Innovations (DOI) theory, which states that e-cigarettes possess attributes facilitating adoption: relative advantage, compatibility with adolescent lifestyles, ease of use, and high observability, causing the product to spread rapidly beyond the control of legal measures alone. In the Thai context, successful tobacco control requires local-level mechanisms through the role of Tobacco Control Change Agents, such as teachers, Village Health Volunteers (VHVs), Sub-district Health Promoting Hospitals (Or Sor Mor), community leaders, and Local Administrative Organizations (LAO). These agents function to communicate risks, monitor high-risk areas, establish social norms, and support local enforcement. However, most research in Thailand focuses on youth as users rather than systematically analyzing the role of Change Agents under the DOI framework, resulting in a lack of in-depth knowledge regarding the working mechanisms of local personnel in slowing the spread of e-cigarettes.

Therefore, studying the role of tobacco control workers in slowing the e-cigarette epidemic is essential for both academic purposes, to fill knowledge gaps, and policy dimensions, to support the development of area-based prevention measures

consistent with the current situation, leading to enhanced protection of Thai youth from increasingly complex risk behaviors.

Objectives

1. To analyze factors affecting the spread of e-cigarettes among Thai youth according to the Diffusion of Innovations (DOI) framework.
2. To synthesize the roles, working processes, and communication strategies of tobacco control workers (Change Agents).
3. To analyze obstacles, limitations, and policy gaps in e-cigarette control measures.

Conceptual Framework

This research framework is synthesized from domestic and international literature, applying Rogers' (2003) Diffusion of Innovations (DOI) theory alongside Innovation Resistance Theory. This framework is used to analyze the mechanisms that Tobacco Control Change Agents can use to slow or undermine the spread of e-cigarettes among Thai youth, which are a modern tobacco product spreading rapidly with innovative attributes favorable for adoption. The framework consists of three key components as follows;

1) Independent Variables: These reflect the role of Change Agents at the local level, divided into three aspects: (1) Educator role to communicate scientific data and correct misconceptions about safety; (2) Surveillance role to monitor risk behaviors and connect users to treatment services; and (3) Social Enforcer role aimed at setting community norms and rules to reduce the legitimacy of e-cigarette use in areas such as schools and public spaces.

2) Mediating Variables: These represent the youth's perception of e-cigarette attributes as an innovation. The operations of Change Agents are expected to adjust perceptions in three dimensions: reducing the perceived relative advantage of e-cigarettes compared to cigarettes, increasing perceived health and legal risks, and reducing the compatibility between e-cigarettes and modern youth culture/identity.

3) Dependent Variables: These reflect the adoption or resistance behaviors of youth, covering two forms: Delayed Adoption and Innovation Resistance/Rejection.

These behavioral changes indicate the effectiveness of Change Agents in slowing the diffusion process locally.

Research Methodology

This study is qualitative documentary research aiming to examine the diffusion mechanism of e-cigarettes among youth under the DOI framework and analyze the role of local Change Agents. The primary methods employed are content analysis and policy analysis. All data were derived from secondary documents, with no direct human data collection.

1) Data Sources Data sources include policy documents, academic articles, public health situation reports, and campaign media or manuals related to the work of teachers, Village Health Volunteers (VHVs), and local administrative organizations. Documents were selected based on relevance, credibility, accuracy, and currency, focusing on materials published between 2018–2025 (B.E. 2561–2568) to reflect the current situation.

2) Data Collection and Analysis Data collection involved searching databases including ThaiJO, PubMed, Scopus, Google Scholar, and official government websites. The analysis involved content analysis to extract key data, thematic analysis to group findings, policy analysis to assess measure effectiveness, and conceptual synthesis to link data to the theoretical framework. Data quality was verified using triangulation, audit trails, and expert consultation to reduce interpretation bias.

Research Results

Current Situation and Trends of the E-cigarette Epidemic among Thai Youth

An analysis of documents published between 2022 and 2024 shows a serious problem, as e-cigarette use among Thai youth has become a widespread epidemic. This crisis is defined not just by the volume of users, but by the rapid evolution of the products and the demographics they attract. Most alarmingly, the prevalence rate among high school and vocational students in certain urban areas has surged to between 17.6% and 30.4%. This represents a more than threefold increase in just five years compared to 2018 data, with vocational students currently engaging in the behavior at nearly double the rate of general education students. This surge correlates

with a calculated shift in product design. The market has transitioned almost entirely from complex refillable systems to disposable "Toy Pods," which now account for over 80% of youth usage. These devices are dangerous specifically because they are accessible and deceptive; priced as low as 150–300 THB, they are designed to resemble stationery or cartoon characters, allowing students to hide them in plain sight from parents and teachers. Furthermore, the demographic profile of the "typical smoker" is changing. While smoking was historically male-dominated, the arrival of pastel-colored devices and fashion-oriented marketing has successfully courted female youth, narrowing the male-to-female ratio to approximately 1.2:1. Fueling this entire ecosystem is an unregulated "online black market." Platforms such as Twitter/X, TikTok, and Line OpenChat have become virtual storefronts where direct sales and Cash on Delivery (COD) services operate freely, by-passing age verification laws entirely.

Analysis of Diffusion Factors under the DOI Framework

To understand why these products have spread so effectively, one must look through the lens of Rogers’ (2003) Diffusion of Innovations (DOI) theory. Rogers posits that five specific attributes determine how quickly a new idea or product is adopted. In the context of Thai youth, e-cigarettes have been engineered to hit every single one of these triggers as Table 1 summarizes the application of these attributes to the Thai context.

Table 1 Application of DOI Innovation Attributes to E-cigarette Diffusion in Thai Youth

Innovation Attribute (DOI)	Application to E-cigarettes in Thai Youth	Effect on Diffusion
1. Relative Advantage	Youth perceive e-cigarettes as "safer" than cigarettes, having no smoke/smell, appearing cheaper per use, and having a modern image.	Accelerates adoption and trial as they are viewed as less risky and "cooler" than cigarettes.
2. Compatibility	E-cigarettes are integrated into digital lifestyles such as TikTok clips, subculture belonging, and relationship building.	Reduces psychological resistance, making smoking "normal" in youth social circles.
3. Complexity	New models, especially disposable pods, are very simple to use (unwrap and use immediately) and portable.	Lowers barriers to entry, allowing even youth with no smoking experience to try easily.
4. Trialability	Low price, sharing among friends, and access to informal trial sources lower the cost of the "first try."	Results in a higher initiation rate compared to traditional tobacco products.
5. Observability	High vapor volume, pleasant scents, and widespread reviews on social media make it highly visible.	Creates motivation to imitate and spreads usage rapidly within youth social networks.

Roles and Strategies of Tobacco Control Change Agents

Synthesis of manuals and reports reveals that Change Agents (teachers, VHVs, community leaders) play a role as "Linkers to Desirable Health Innovations." They promote life skills, creative community activities, and social measures like "Smoke-Free Sub-district Health Charters". Furthermore, they employ specific strategies to counter the DOI attributes of e-cigarettes, as detailed in Table 2.

Table 2: Strategies Countering DOI Attributes of E-cigarettes

DOI Attribute	Change Agent Strategy	Perception Modification Goal
1. Relative Advantage	Expose the "safer" myth with data; exhibits/clips on long-term effects of nicotine salts.	Decrease Relative Advantage
2. Compatibility	"New Gen Loves Health, Not Smoke" campaigns promote a new identity where "Not smoking is truly cool."	Decrease Compatibility
3. Complexity	Emphasize the "hidden complexity of danger" such as addiction.	Increase the Complexity of Harm
4. Trialability	Create environments reducing trial opportunities (School/Community Watch); reinforce refusal skills.	Decrease Trialability (Increase difficulty)
5. Observability	Create "visible" alternative online content for successful Gen Z non-smokers.	Counter Observability

Cross-Case Analysis and Policy Gaps

A cross-case analysis of the current tobacco control landscape reveals three profound structural and operational gaps that undermine the efficacy of prevention efforts. These deficiencies highlight the disconnect between legislative intent and the practical realities of the evolving e-cigarette epidemic.

Foremost among these challenges is the Policy–Enforcement Gap. Although Thailand ostensibly enforces a "total ban" on electronic cigarettes, a stark dichotomy exists between the strict prohibition in physical spaces and the permissive environment of digital markets. While offline channels are relatively contained, online platforms operate with little oversight. This enforcement failure is exacerbated by the fragmentation of authority across various agencies, which include the Office of the Consumer Protection Board (OCPB), the Customs Department, and local administrative bodies. The lack of a unified command structure and proactive coordination among these entities creates jurisdictional ambiguities that allow illegal online trade to flourish. Simultaneously, a

Capacity Gap significantly impedes the effectiveness of frontline Change Agents. Teachers and Village Health Volunteers (VHVs), who are central to community-based prevention, are often burdened with existing responsibilities and lack continuous training regarding the rapidly evolving nature of e-cigarette products and marketing tactics. Furthermore, schools and communities frequently suffer from resource constraints, preventing the production of modern, appealing media content that resonates with youth. Consequently, in the absence of adequate counseling skills and resources, institutions often revert to punitive measures, which address the symptom rather than the root cause of addiction.

Finally, a Strategic Communication Gap persists in how prevention messages are disseminated. Current communication strategies rely heavily on a "top-down" approach that utilizes "fear appeals" to deter usage. This method often proves ineffective as it conflicts with the adolescent psychological construct of the "personal fable," the belief in one's own invulnerability and uniqueness. By failing to integrate behavioral insights or include youth participation in the design of health messaging, current campaigns often alienate the very demographic they aim to protect, widening the distance between health authorities and at-risk youth.

Summary of the Study

This study investigates the causes behind the rapid spread of e-cigarettes among Thai youth and evaluates the response from tobacco control networks. The results confirm that the "epidemic" is driven by how well e-cigarettes fit the five criteria of Rogers' Diffusion of Innovations (DOI) theory. Specifically, these products appeal to youth because they offer a relative advantage (appearing safer and modern), fit well with digital lifestyles (compatibility), are easy to use (low complexity), are cheap to try (trialability), and are highly visible on social media (observability). The research also focuses on the essential role of local Change Agents, such as teachers, Village Health Volunteers (VHVs), and community leaders. These individuals act as the community's primary defense. Their strategy involves "counter-diffusion," or slowing the trend by correcting safety misconceptions, establishing social norms that value non-smoking, and enforcing local rules to limit access.

However, the discussion identifies three major barriers that limit the effectiveness of these efforts:

1. The Policy–Enforcement Gap: There is a disconnect between strict laws (a total ban) and the reality of unregulated online markets.
2. The Capacity Gap: Frontline workers often lack the necessary resources and modern digital skills to keep up with changing products.
3. The Strategic Communication Gap: Current prevention campaigns rely heavily on "fear appeals," which often fail to influence the behavior of young people.

Theoretically, this study demonstrates that perception is often more powerful than fact when youth decide to adopt a new product. Practically, the findings suggest that a shift in strategy is needed. Instead of relying solely on punishment, policymakers should adopt a "Counter-diffusion Strategy" that empowers youth and equips Change Agents with the tools needed to address the problem in the digital age.

Discussions

The findings of this study offer critical theoretical and practical insights into the mechanisms driving the e-cigarette epidemic among Thai youth. Theoretically, the research confirms that Rogers' Diffusion of Innovations (DOI) theory is not only applicable to beneficial technologies but also serves as a powerful framework for explaining the spread of "negative innovations." The rapid adoption of e-cigarettes in Thailand validates the premise that adoption is driven less by the objective safety of a product and more by its perceived attributes. For Thai youth, e-cigarettes have successfully masqueraded as a "superior innovation" to offer the perceived relative advantages of safety, social status, and modernity over combustible tobacco. This suggests that future prevention efforts cannot rely solely on factual health warnings; they must actively dismantle these positive perceptions, essentially employing a "counter-diffusion" strategy that re-frames non-smoking as the true innovation.

Practically, the study highlights a necessary paradigm shift for Tobacco Control Change Agents. The current analysis reveals that while the structural network of teachers, Village Health Volunteers (VHVs), and community leaders is robust, their traditional role as "enforcers" is becoming obsolete in the digital age. The "Controller"

model, which focuses on bans and punishment, struggles to compete with the agile, youth-centric marketing of the e-cigarette industry. The discussion points towards a need for these agents to evolve into "Facilitators" and "Empowerers." By shifting the focus from suppressing behavior to building digital literacy and resilience, Change Agents can partner with youth to co-create protective social norms, rather than imposing them from above.

Finally, at the policy level, the persistence of the "epidemic" despite strict legal bans exposes the limitations of a fragmented control system. The study underscores that the battleground has shifted from physical storefronts to a complex digital ecosystem comprising social commerce, logistics, and influencers. The "Policy–Enforcement Gap" discussed here in suggests that successful control requires "ecosystem governance." This entails moving beyond siloed health policies to integrate with national digital economy frameworks, ensuring that online platforms and logistics providers are held accountable as gatekeepers. Without this structural integration, local efforts by Change Agents will remain a temporary fix to a systemic problem.

Recommendations

1. Develop legal frameworks and a specific unit for online e-cigarette market regulation with authority over social media, payments, and logistics.
2. Integrate control policies with National Digital Policies, embedding digital and media literacy in education curricula.
3. Allocate targeted budgets via local health funds for continuous local prevention projects.

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