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Original Investigation

Barriers and facilitators to enforcing E-cigarette regulations for online sales

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Abstract

Introduction: **Online sales of e-cigarettes challenge the enforcement of state tobacco control (TC) policies. Using key informant (KI) interviews, we examined barriers and facilitators to implementing TC policies in the context of e-cigarettes sold online.**

Methods: **From April 2023 to December 2024, we invited state representatives from all 50 states and the District of Columbia to participate in KI interviews. Guided by Bullock's (2021) policy implementation framework, we examined licensure, minimum legal sales age, flavor bans, and taxation. Data were analyzed using team-based, iterative coding.**

Results: **We conducted 74 semi-structured interviews with 90 KIs across 41 states, of which online sales emerged as a key theme in 41 interviews with 60 KIs across 34 states. KIs noted how online sales interacted with existing legal frameworks and enforcement methods, often creating challenges, including jurisdictional ambiguity over out-of-state or international sellers, limited capacity to monitor the emergence of new online sellers, statutory language not designed for digital commerce, supply chain ambiguity, and logistical difficulties in conducting online decoy buys. KIs noted several potential enforcement facilitators, including the Prevent All Cigarette Trafficking Act (e.g., monthly delivery sales reports), consumer complaint systems, internet surveillance, directories of products authorized for sale, and interstate coordination of data sharing. Some states pursued legal action against online retailers using consumer protection laws.**

Conclusions: **Online e-cigarette sales present a regulatory challenge for TC implementation, requiring policy adaptation, cross-jurisdictional coordination, enhanced monitoring, and research to guide effective regulation of the digital marketplace.**

Implications: **This work may inform future policy and enforcement strategies by highlighting the unique regulatory gaps created by online e-cigarette sales. Traditional tobacco control mechanisms, developed initially for brick-and-mortar retailers, are not well-suited to the rapidly evolving online marketplace. Strengthening the utility of the Prevent All Cigarette Trafficking Act by integrating reporting, shipping, and tax compliance data into state licensure, minimum legal sales age, flavor, and tax enforcement could help states more effectively detect noncompliant sellers. Complementary measures such as robust age verification, clearer statutory definitions, and partnerships with carriers, financial institutions, and technology platforms are critical to adapting tobacco control to the realities of digital commerce.**

Keywords legislation/regulations/policies, e-cigarettes/vaping, tobacco regulatory science

Introduction

"*The biggest issue with e-cigarettes is it's an industry that changes so rapidly and so quickly. And then people are—they're buying a significant amount of product over the internet . . .*"

The electronic cigarette (e-cigarette) landscape in the United States has evolved rapidly, driven in part by the expansion of online access. Estimates of the proportion of e-cigarette sales occurring online range from 7% to 45%, with lower estimates derived from surveys of youth behavior and higher estimates

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from online surveys or sales-based samples of adult populations, reflecting uncertainty in the size of the online market across populations and measurement approaches.[1-6] Online platforms such as social media and delivery apps further expand the sale and distribution of e-cigarettes.[3,7-11] These online channels create unique enforcement challenges to existing tobacco control (TC) policies such as retail licensure, minimum legal sales age (MLSA), flavor restrictions, and taxation, originally designed for brick-and-mortar retail environments.

Several federal policies have been enacted to regulate e-cigarette sales in the United States. The Food & Drug Administration (FDA)'s 2016 "Deeming Rule" expanded regulatory authority to include e-cigarettes under existing tobacco regulations, requiring premarket review, age restrictions, and labeling requirements.[12] In 2020, the Prevent Online Sales of E-cigarettes to Children Act amended the 2010 Prevent All Cigarette Trafficking (PACT) Act to include e-cigarettes, expanding federal oversight of online e-cigarette sales.[13,14] The amended PACT Act requires online sellers to submit monthly reports of delivery sales (ie, internet, mail-order, telephone transactions) to state tax administrators, prohibits the shipment and transport of products through the U.S. Postal Service, requires identity verification, and imposes package labeling requirements.[13-17] The Act also requires sellers to comply with state and local TC laws, including licensure, MLSA, flavor restrictions, and taxation for e-cigarette sales.[18] Since 2016, the federal government, led by the Department of Justice (DOJ), has prosecuted untaxed cigarette sales under the PACT Act, including remote and delivery sales, and in 2024, the DOJ formed a multi-agency task force with the FDA to address illegal e-cigarette sales, including online.[19,20] Despite these federal efforts, online sales continue to complicate states' enforcement of e-cigarette policies.[11,21,22]

While challenges have been noted, details on barriers and facilitators to implementing e-cigarette policies in the context of online sales remain underexplored. This paper aims to understand how online sales fit into the existing e-cigarette policy implementation landscape and to highlight enforcement challenges and potential solutions using qualitative data from state regulators.

Materials and methods

This study examined state-level implementation of five e-cigarette policies: MLSA, taxation, clean indoor air, tobacco retailer licensure, and flavor restrictions.[23-25] The study recruited participants from the Tobacco Control Network of the Association of State and Territorial Health Officials, the National Federation of Tax Administrators, and state websites across all 50 states and the District of Columbia to participate in interviews for 1–3 policies. A purposive sampling approach was used, considering variation in policy characteristics, policy context, and geographic distribution. Participants were assured that their names or state identifier would not be attached to the reported data to encourage open dialog.

Interview guides were designed using Bullock's theoretical framework for determinants of policy implementation,[26] with online sales emerging in response to broader implementation questions such as, "What are the main weaknesses of the implementation process?," "Is there anything in the language [in the policy] that makes it challenging for you to do what you need to be doing?," and "Are there important loopholes to the statute?" The Mass General Brigham IRB determined the study was "exempt" human subjects research under 45CFR 24.104(d) (Protocol #2022P001445).

Semi-structured key informant (KI) interviews were conducted. Interviews were video-recorded, transcribed, dual-coded, and analyzed using a codebook derived from deductive and emergent codes in Nvivo 14.[27] Coding discrepancies were resolved through consensus. Deductive and emergent code definitions were tailored for each policy through an iterative, team-based approach that enabled identification of themes specific to individual policies as well as comparisons across policies. Data within each code were summarized by the coding team and reviewed by the larger study team to generate themes.

Results

Between April 2023 and July 2024, we conducted 74 interviews with 90 KIs across 41 states, covering five TC policies. Online sales were discussed across all policy areas except clean indoor air, appearing in 41 interviews with 60 KIs across 34 states. In total, 169 coded segments referenced online sales: 10 of 15 licensure interviews (15 KIs), 12 of 23 MLSA interviews (17 KIs), 7 of 9 flavor policy interviews (7 KIs), and all 12 tax interviews (21 KIs). Quotes from 23 KIs across 22 states are included in the results (1–3 quotes per KI; median = 2). Key themes related to regulating online e-cigarette sales emerged, including legal frameworks, enforcement methods, and enforcement challenges. Findings are presented by policy area: licensure, MLSA, flavor restrictions, and taxation.

Licensure

In licensure interviews, KIs described how state laws, originally designed for regulating brick-and-mortar tobacco retailers, often failed to account for the complexities of online sales, resulting in inconsistent licensing practices, uncertainty about enforcement authority, and challenges in identifying and addressing violations across jurisdictions. KIs shared their states' approaches to licensing online retailers, with some requiring physical retail locations within the state for e-commerce licensure, some licensing out-of-state online retailers, and some limiting licensure to only over-the-counter sales—essentially prohibiting licensure of online retailers all together. Several KIs noted legal ambiguity and regulatory gaps, as many laws did not explicitly address licensure for online sales of e-cigarettes. "*We don't have regulation that accounts for [online retailers] . . . I'm going to handle it just like it's a brick-and-mortar situation. But as I said, we don't have an administrative rule that accounts for it.*"

In the absence of clear legal guidance, states varied widely in how they enforced licensure requirements for online e-cigarette retailers. Some KIs mentioned using PACT Act reports to identify unlicensed shippers and to enforce compliance ("*We do get the PACT Act reports and stuff from the wholesalers coming in, so we can look to see who may be receiving product that is not licensed with us.*"), while others were unaware of or did not use the reports ("*No. I don't know that I've heard of the PACT Act*"). One KI mentioned that enforcement responsibility fell to the Attorney General (AG)'s office for online sales, which could impose penalties and bar unlicensed out-of-state sellers from future licensure.

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Table 1 Licensure policies

Domains	Quotes
Legal framework	"*I was thinking from a delivery seller perspective, are you including online sales of part of this licensure process? When this first rolled out in [year], I believe there wasn't really a delivery seller piece of that where you could capture those online sales. But we do have that in place. And that is actually administered by the [Department of Revenue]. So, we do license them at the state level for basically the online sellers.*"
	"*. . . there's some parts that are a little awkward and that it doesn't necessarily deal well with kind of internet-based transactions for registrants outside the state, which is a problem almost for all of our law if it doesn't particularly call it out.*"
Enforcement methods	"*. . . currently enforced by the [Attorney General] . . . we did put in [the budget request] additional funds to perform online buys. That is one area that is extremely difficult to enforce, and especially because of the way our statutes read. If you're an out-of-state wholesaler, and you sell to a retailer or ultimate consumer in our state, you have to be licensed as a wholesaler. So, when we do online buys, that's what we're going to be looking for is an out of state wholesalers who doesn't have a presence in our state and did they sell it to [someone in City X]. Those will be enforced. Obviously, at that point, they're going to be operating as an unlicensed wholesaler, which will incur civil penalties, will incur a cease-and-desist letter as well . . . technically, we couldn't take a suspension hearing because there's no license to suspend at that time. But we could absolutely, because of that enforcement action, restrict and prohibit them from receiving a license in the future.*"
	"*The tax compliance area, which is us. And our examiners reach out to the companies who are identified as shipping products into the state. And we reach out and say, 'Hey, you need this license with us to do that.'*"
Enforcement challenges	"*. . . the biggest challenge for us has been to conduct compliance checks to have products delivered to a location. Unfortunately, you don't want products to be shipped to your own personal home because again, it typically goes through a carrier, which means that information is available to them and possibly the driver . . . So again, you don't want to ship it to your own agency because then that may be something that is captured by them or known ahead of time to prevent it, right? So, we found a lot of states grappling with exactly how to conduct online compliance check if you don't have a residential home that you can attempt delivery on just to see how it would be done, right? But it's something that we do try to do, but the actual purchase itself, typically, we don't follow completely through so that the shipping doesn't go through. We want to see if the website has any blocks, any warnings, any restrictions . . .*"
	"*Okay. So, with online sales, unless someone complains on it or I happen to see somebody selling online, we're not even going to look at it. I mean, that's just reality because I don't just sit and look on the internet for stuff because I don't have time to do that. If I happen to come across it or somebody sends me something, then we would try to check on it. But it's very, very difficult.*"

Five key informants across five unique states were quoted in this table.

Despite efforts to enforce licensure requirements, KIs described persistent challenges related to jurisdiction, supply chain complexity, and resources. Jurisdictional limitations were a major barrier, especially when dealing with online retailers selling products across state lines or from outside the United States. A frequent sentiment among KIs was "*your bigger problem is when you have the unlicensed distributor selling direct to end consumers and those internet sales that you cannot track.*" One KI described how e-cigarettes often move outside the traditional wholesale–retail system, particularly when manufacturers bypass wholesalers and sell directly to retailers, or manufacturers and wholesalers sell directly to consumers, increasing the risk of unlicensed sales from out-of-state sources:

> "*. . . we do see a higher risk of retailers purchasing [e-cigarettes] from a source that is less likely to report themself or get licensed in [State] from out of state . . . And a part of that reason is because the manufacturer themselves are selling it. So, they're not really going through this vertical system of going through a wholesaler and then going to a retailer.*"

(Note: "Distributors" and "wholesalers" are used here interchangeably to refer to intermediaries that supply products to retailers, though legal definitions may vary by state.) KIs also noted struggles due to limited resources, reliance on consumer complaints, and the lack of proactive monitoring and surveillance tools: "*that means that we absolutely 100% need more resources, especially when you're talking about changing how the industry should be regulated with possible online sales, deliveries, and things like that.*" Further illustrative quotes are found in Table 1 for licensure.

Minimum legal sales age

In MLSA policy interviews, many KIs described significant gaps in enforcing age restrictions for online e-cigarette sales, highlighting weak or absent age verification processes, limited use of monitoring tools such as decoy buy attempts, and major barriers to identifying and holding online sellers accountable. As a result, many KIs noted the ease with which underage buyers are sold e-cigarettes online illegally in their states.

Building on these concerns, KIs described a range of enforcement approaches, though in many cases, states were not actively enforcing MLSA laws in the online space: "*we don't necessarily do the online checks right now.*" Some states did conduct online decoy buys, often in coordination with the AG office, although these efforts were limited. Other enforcement tools included citizens' complaints submitted via email or phone. In contrast, one KI described a more systematic and relatively uncommon approach involving internet surveillance and online decoy buys, where "*investigators attempt to purchase one of those products*" to identify violations and "*document data relative to that purchase, everything from do they ask if you are over 21?*" In this state, completed sales in violation of MLSA laws were referred to the AG's office for cease-and-desist actions or civil penalties, resulting in substantial settlement amounts. The KI also reported plans to expand enforcement by using artificial

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Table 2 Minimum legal sales age policies

Domains	Quotes
Legal framework	"*Well, the other issue that we haven't really talked about is the issue of online sales and delivery sales. Obviously, social sources, but I leave that a little bit more to the public health side. And we do talk about social sources in our retailer education class and give some suggestions for avoiding those. But generally, that's a little bit more on the education side. So, we have a statewide delivery sales ban where it's illegal to order traditional commercial tobacco products, combustible tobacco products over the internet. It would be fabulous if we could get e-cigarettes added to that because I think online sales are a big gap.*"
Enforcement methods	"*. . . they'll actually go ahead and try to purchase the cigarettes online with probably a gift card or something like that to see if they're going to sell without checking.*"
Enforcement challenges	"*. . . we don't have purchase money or anything to be able to purchase products like that . . . And if they're trying to see if someone's delivering to a minor or anything like that . . . There's a lot to them having to set up a house and wire it and have a minor there . . . you can't keep somebody's kid over there for days in case the shipment was late.*" "*So, it is challenging on our side to find out who is and, when new retailers come online, who's selling tobacco products, because we only can go with the information that we have.*" "*So, I think that's a strong point for us that we did the work to put the language in the statute that was needed. But then like [Interviewee 2] said, especially the vapor industry, which is what we're kind of talking about today, it's still the Wild, Wild West. Everybody is putting stuff on the internet. So, we have the laws, and we can try to enforce the laws, but it's a very difficult process to enforce online sales when a company in another state is more than willing to pop a vapor product in the mail to a 12-year-old, so.*"

Five key informants across five unique states were quoted in this table.

intelligence to enhance detection and monitoring of online sales.

Enforcement of MLSA for online sales remained difficult in most states. One of the biggest challenges was identifying who was selling online into the state to verify compliance with age restrictions. KIs noted that weak age verification systems and the potential for false IDs undermined compliance efforts. As previously reported,[28] one KI explained: "*they also have a method for remote sales or verification when we would probably prefer that they have a requirement that age verification occur in person . . . it could be—yeah, like somebody steals their parent's ID, their website doesn't sufficiently check that kind of thing.*" Several KIs emphasized the need for robust checks not only at the point of sale but also at the point of delivery, to prevent underage access even when online purchases were successfully made. One KI questioned the extent to which online sales were occurring, suggesting that most e-cigarette transactions still occurred in physical stores, despite the absence of any specific state regulations banning or monitoring online e-cigarette sales. Illustrative quotes on MLSA online sales are found in Table 2.

Flavors

In interviews for flavored e-cigarette restrictions, KIs raised concerns that existing flavored product policies were difficult to apply to the context of online sales. Although most state laws restricted flavored e-cigarette sales by "retailers," many KIs noted that the legal language was typically tailored to brick-and-mortar stores, creating confusion around online enforcement, especially when flavored products were stored at physical retail locations within a flavor ban state to be sold online, or when transactions occurred through apps. In these cases, it was unclear whether such sales were subject to the same rules as over-the-counter transactions. One KI described how their state addressed this loophole by explicitly prohibiting flavored products from being stored on-site, even if they were intended for online, out-of-state sales:

> "*The regulations say that it can't be on the premises. Right? So, if you find it, they need to take it out of the building. They can't just say, I have an online business also, and I'm shipping it to wherever.*"

States used different strategies to enforce flavored product restrictions online. One KI described a process in which TC compliance investigators manually conducted a set number of investigations of online sellers by visiting vendor websites, initiating transactions up to the payment stage, capturing screenshots of terms and conditions, and determining whether the seller shipped into the state. The investigators were tasked with bringing online retailers "*into compliance or issue fines.*" This included researching corporate entity status and locating registered agents in relevant states to facilitate enforcement. A KI in another state mentioned conducting underage compliance checks that included tracking whether online sellers were offering flavored products.

KIs cited unclear agency roles ("*I'm not sure who's addressing that. I don't know*"), jurisdictional ambiguity, and the added complexity introduced by COVID-era practices such as curbside pickup and app-based ordering challenging the enforcement of flavor policies in the online environment. The lack of agency authority was especially apparent in states where TC enforcement was delegated locally, with little to no action at the state level. States also pointed to the difficulty of identifying flavored products online, where sellers often used vague or coded product listings to circumvent flavor bans. Additional quotes from flavor interviews are found in Table 3.

Taxation

In tax interviews, KIs described uncertainty and challenges with how existing tax frameworks apply to online e-cigarette

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Table 3 Flavor policies

Domains	Quotes
Legal framework	"*So, they could have a website where they're selling out-of-state. So, the fact that they have these [flavored] products, for example, maybe behind the counter or in their storeroom . . . they can say, 'Well, we're not selling them to anybody here, but we have them back there because we're shipping them out to wherever.*"
Enforcement methods	"*We did do our own online kind of compliance checks just to see if we could get product. But mostly it was for underage. And our compliance check rates were the same online as they were in stores, roughly. Still high, higher than we want, but it was like 13% of the online places sold. And they sold flavored products.*" (quote also reported in Kruse et al., 2025)
Enforcement challenges	"*So, if you're thinking of a bottle with holes in it, we're trying to put corks in it to stop the sale— or these products coming out. We've stopped a few holes, but the online sales part, the out-of-state sales part, the ambiguity of who should be enforcing it, I think those are corks that are not being put in specific holes.*"
	"*So, the weaknesses really, I believe, are confusion sometimes. Right? Like about what products are really included or not included . . . And the ability to address things like online buys or products that are being sold only with certain code words or being able to kind of ferret out those types of situations. Especially when it comes to the big products because— I just think that they're easier to kind of hide somehow or—*"

Four key informants across four unique states were quoted in this table.

transactions. While most states assess excise taxes at the wholesale level, several KIs noted that this model often breaks down when out-of-state or unlicensed sellers ship products directly to consumers. In these cases, it is unclear whether the tax obligation fell on the seller or the buyer, leading to inconsistent application of tax laws:

> "*. . . one person has to pay the tax [in an online sale to an individual], either the person that receives it or the person that sends it in. Generally, if they're sending it in, they would want to be licensed to handle that burden for all of their customers, but it doesn't necessarily work out that way.*"

One KI explained that out-of-state sellers must register as remote sellers and are legally obligated to pay taxes according to product type.

States employed a range of enforcement methods to address online tax compliance. One KI described conducting compliance checks and issuing cease-and-desist orders as part of their enforcement strategy. Other methods included coordination between states to share information on violators ("*We'll get some information from other states that will identify sales going direct to consumers*"), as well as collaboration with federal agencies such as the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) to assist in enforcement actions ("*And if they're [sellers] not sending [PACT Act reports], and we find out, then we generally reach out to the feds, to the ATF, to pursue compliance*"). Several KIs described using PACT Act reports to identify incoming delivery sales, detect tax violations, and pursue compliance, even billing consumers for untaxed sales.

> *"That's another fresher issue for us is the delivery sales. And we're just starting to kind of audit that a little bit. Our statute, even though it's tied to PACT Act stuff, the feds . . . the PACT Act provides us some authority to tax that.*"

Even with these tools in place, enforcement of tax compliance remained difficult. KIs reported challenges tracking and taxing low-volume shipments from unlicensed sellers who operated outside the typical distribution chain. One KI noted that the absence of a standardized product directory for e-cigarettes further complicated efforts to verify and audit online sales. Many also cited resource and staffing constraints that limited their ability to proactively monitor digital sales channels.

> "*Here's the thing. Again, that's kind of like nailing Jell-O to a wall. As I understand it, from my limited knowledge, I think that we would have to create a separate unit that monitors the internet. And we don't have the manpower to do that. We don't have the budget or the manpower yet to do that.*"

Illustrative quotes for taxation are found in Table 4.

Discussion

This study highlights the growing challenges states face in enforcing TC policies (licensure, MLSA, flavor restrictions, and taxation) in the context of online e-cigarette sales. Cross-cutting enforcement challenges included jurisdictional ambiguity when retailers operate across state lines, limited resources to monitor the proliferation of online sellers, statutory language not tailored to digital commerce, complexity of online supply chains, and logistical difficulties of conducting online decoy buys. States often relied on tools such as the PACT Act, citizen complaints, and federal support to fill enforcement gaps.

Although some challenges resemble those in cigarette regulation, the scope and nature of regulatory challenges in the online e-cigarette market are distinct. E-cigarettes entered the market rapidly with far less regulatory oversight than existed for cigarettes, while being marketed through digital channels and social media. Online retailers offer a wide variety of flavors, devices, nicotine concentrations, and delivery formats, complicating product classification and enforcement. Furthermore, regulatory frameworks and shipping bans that apply to cigarettes were not initially extended to e-cigarettes, leaving gaps that many sellers continue to exploit.

These regulatory gaps are especially pronounced in online sales, where tracking authorized products and enforcing federal requirements is challenging. Under federal law, e-cigarette manufacturers must submit FDA premarket tobacco product applications (PMTAs) for marketing authorization. To date, only 39 products, limited to tobacco and menthol flavors, have been authorized. Over 26 million products have been denied, more

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Table 4 Taxation policies

Domains	Quotes
Legal framework	"*So, for online sales, the sellers are required to file a monthly PACT Act report with the state that they are shipping into. That's a federal requirement. So, we have quite a few PACT Act reports that we get from out-of-state sellers. Some of them are online selling to individuals. Some of them are shipping into [State] to some of our retailers . . . So basically, if the out-of-state seller is selling to individual customers, they are required to register with us as a remote seller, and they're required to register for the tax for whatever product that they're selling. If it's the container e-liquid, they have to register for the vapor business tax. If it's the pods and the cartridges, they have to register for the tobacco tax. So that's at the federal level. And we kind of rely on the ATF to go after those people because we have no jurisdiction to go after them because they're not in [State]. Obviously, if it's a [State] seller that is selling over the internet, we can go after those people if they're not doing things properly.*"
Enforcement methods	"*So, if we get a PACT Act report and somebody's selling— looks like it should be taxable to us, but maybe they're not registered, our investigators could reach out on that situation.*"
	"*So, in regard to online sales, if it's an in-state wholesaler or even an out-of-state wholesaler that's registered to us, they still have to report who they sold it to. Our reporting is, for tax purposes, if you're in-state, it's when the product is first received. If you're out-of-state, it's when the product is sold to a retailer or ultimate consumer. And online sales are extremely difficult to enforce only because it's hard to track websites. It's hard to see what somebody's doing through there. However, if a wholesaler is licensed and they do make sales through their online system, they do have to report those sales to us. When they do their monthly filings with us, they have to provide the date the product was sold, the date they received the product, the invoice number, who it was sold from, and—received from and sold to. So, we track the product as much as we can. But online sales, if they're here or if they're registered with us, are still required to be reported.*"
Enforcement challenges	"*If we do an audit on the distributors, if it's somebody that's totally off our radar, they'd be very hard to find . . . But if you're selling just really small sales, but maybe a lot of them, it's going to be really hard to uncover that . . . periodically, we might get information from another state that, 'Hey, it looks like these guys are selling a bunch of stuff into your state.' And we share that too with other states when we run across that*"
	"*We're barely keeping our thumb on the pulse of what's going on in the physical stores in our state, let alone dealing with everybody from every other state who's selling into our state. I can say that, recently . . . we've had several applications for wholesale licenses from online businesses. And that's a new project for us because we've never issued licenses to online businesses before. And we're kind of understanding that, well, the first reaction might be, 'Oh. We're not giving you a license.' Then we have to kind of take a step back and think, 'Okay. This might be a way to monitor what they're doing and have a modicum of control over what's happening in our state with these online businesses.' . . . we're navigating our way through how to give a license to an online business that isn't even located in [State] and get them to report sales and remit tax to us.*"

Four key informants across four unique states were quoted in this table.

than 20 million remain under review, and many unauthorized products continue to be sold, often without publicly available information on the status of PMTA review.[29-31] The FDA Center for Tobacco Products estimates that up to 54% of the e-cigarette market is illicit and has issued warning letters to online retailers selling unauthorized products.[32-34] Despite federal enforcement efforts, insights from KIs and state policy reviews suggest state-level opportunities to strengthen statutory language, close enforcement gaps, and improve interagency coordination to regulate online sales.

Licensure emerged as a foundational policy area, closely tied to taxation, MLSA, and flavor enforcement. A central challenge in regulating online e-cigarette sales was identifying who the sellers were and where products were being delivered from, particularly when vendors operated outside state lines or outside formal distribution channels. While the PACT Act requires registration with federal and state authorities and delivery sales reporting, our findings suggest its potential remains underutilized. Several informants noted leveraging PACT Act reports to support licensure and tax enforcement by cross-referencing shipment data against lists of licensed retailers and identifying noncompliant vendors. However, PACT Act reports lack product-level detail, making them less useful for monitoring sales of flavored products.[35] This limitation seems to be reflected in our findings, as PACT Act reports were not mentioned in any flavor-focused interviews as an enforcement tool. States like Nebraska have adopted a more proactive approach to utilizing the PACT Act by codifying language in state statute that explicitly prohibits unauthorized delivery sales of e-cigarettes into the state and requires manufacturer certification.[36] This statutory alignment strengthens state authority by integrating federal requirements into the state's licensure and tax framework. Looking ahead, enhanced collaboration with shipping carriers, which are explicitly regulated under the PACT Act,[17] could further support enforcement. These entities play a critical role in enabling online transactions and shipments and could serve as valuable enforcement partners by helping to identify, intercept, or block illicit transactions. Voluntary agreements with major credit card companies, established in 2005, illustrate how collaboration with financial institutions could contribute to reducing illegal sales.[37]

MLSA enforcement also faces persistent challenges in the online environment. While 27 states require some form of age verification, only seven mandate presentation of a government ID at delivery, and fewer utilize third-party databases.[38] Minimum standards of online age verification, including third-party identity verification at the point of sale, government-verified e-ID schemes, and ID scanning at the point of delivery, should be considered.[39] Establishing robust online age verification practices can help prevent illegal underage sales of e-cigarettes.

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Online flavor enforcement is constrained by vague legal definitions, mislabeled or deceptively marketed products, and the use of vague or euphemistic flavor descriptors. One strategy to strengthen enforcement is the adoption of a definition of non-tobacco-flavored products that encompasses both characterizing flavors and concept flavors, including those created with synthetic nicotine. While a universally accepted definition has not been adopted nationwide, efforts at the state level illustrate possible models. California has addressed this gap through legislation AB 3218 and SB 1230 establishing an "Unflavored Tobacco List" administered by the State AG, which prohibits delivery sellers (including online sellers) from selling any tobacco products not on the list.[40] San Francisco has also strengthened enforcement by limiting permitted sales to products authorized through the PMTA process.[29,30] Clearly identifying authorized products through an inclusion list, rather than exclusion, can help jurisdictions monitor and restrict online product sales.

Taxation enforcement is particularly difficult in the fragmented online marketplace. While many states currently impose e-cigarette excise taxes at the wholesale level, this model often fails to capture direct-to-consumer transactions, especially when sellers act as both manufacturer/wholesaler and retailer, as reflected in our interviews. In these cases, uncertainty about tax responsibility can obscure liability and allow parties to shift responsibility and subvert payment. Maryland and New York place tax responsibility at the retail level, thereby reducing opportunities to circumvent payment by ambiguous supply chain actors.[41] Clarifying that online and direct-to-consumer sellers qualify as "retailers" under state law can help close enforcement gaps by requiring taxes be paid prior to or at the point of a retail transaction. Additional strategies, such as implementing e-cigarette tax stamps, could further improve traceability and compliance with state tax requirements.

Across policy areas, coordinated efforts between and within states remain a critical strategy to help close jurisdictional gaps and deter noncompliant online sellers. Civil actions led by state AGs have resulted in settlements, court orders, and business bans of retailers that violate e-cigarette regulations. States and local jurisdictions have pursued legal action against online sellers, including cases brought by New York City,[42] Vermont,[43] California,[44] and Chicago.[45,46] These actions demonstrate how existing consumer protection, tax, and flavor statutes can be leveraged to address enforcement challenges. While these cases are not the norm, their success highlights promising enforcement strategies. Expanding such efforts through interstate collaboration, data-sharing agreements, increased funding for online decoy buys and investigative staff, and additional litigation could strengthen state and local oversight of the online marketplace. Additionally, clear legal definitions and statutory provisions specific to online sales are essential for effective enforcement. Without these provisions, many online sellers may evade policy requirements by operating across state lines or outside traditional supply chain classifications.

Finally, technology-based enforcement holds promise. Tools like artificial intelligence and web-scraping may support monitoring by identifying unlicensed sellers, detecting restricted or mislabeled products, and tracking activity across social media and e-commerce platforms.[39,47] However, cautious implementation is essential to address data privacy concerns, ensure legal compliance, and mitigate algorithmic bias and inaccuracies through appropriate oversight. As the online marketplace continues to evolve, these tools may help scale enforcement efforts.

This study has several limitations. Not all U.S. states were represented, as 10 states declined, withdrew, or did not respond to interview requests. Because a limited number of interviews were conducted per policy topic, not all states were represented across all policy areas. Nevertheless, thematic saturation was achieved, with consistent themes emerging across interviews. Online sales emerged unprompted in most early interviews, with probes added later, underscoring its salience in e-cigarette policy implementation.

Currently, U.S. states vary widely in their regulation of e-cigarettes and online tobacco sales. While some states, including Arkansas, Maine, South Dakota, Utah, and Vermont, have enacted bans on online e-cigarette sales, others rely on general tobacco regulations that may not fully address the complexities of the digital marketplace.[21,48] Even in states with full online sales bans, implementation may vary. Internationally, countries also vary in their approaches to e-cigarette regulation, with 42 countries completely banning e-cigarettes and 91 countries adopting regulatory measures that shape how products are sold and distributed, some of which include regulations on online sales.[49] The recommendations presented here are based on logical extensions of challenges identified by KIs. Further research is needed to assess the effectiveness of the proposed strategies, many of which may be resource-intensive and dependent on jurisdictional capacity, political will, available funding, and federal support for state regulation and enforcement.

This study reveals the growing enforcement challenges that states face in regulating online e-cigarette sales across licensure, MLSA, flavor restrictions, and taxation. Enhanced use of PACT Act reports, clearer legal definitions, stronger age verifications, and adoption of new technology can help support more effective regulation. Strengthening interstate coordination and adapting existing TC frameworks to the realities of online commerce will be critical to closing enforcement gaps and protecting public health in the digital age.

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Data availability

The data underlying this article cannot be shared publicly due to privacy of the states that participated in the study. The data will be shared on reasonable request to the corresponding author.

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