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Content analysis of age verification, purchase and delivery methods of internet e-cigarette vendors, 2013 and 2014

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Abstract

Objective—Identify the population of internet e-cigarette vendors (IEVs) and conduct content analyses of their age verification, purchase and delivery methods in 2013 and 2014.

Methods—We used multiple sources to identify IEV websites, primarily complex search algorithms scanning more than 180 million websites. In 2013, we manually screened 32 446 websites, identifying 980 IEVs, selecting the 281 most popular for content analysis. This methodology yielded 31 239 websites for screening in 2014, identifying 3096 IEVs, with 283 selected for content analysis.

Results—The proportion of vendors that sold online-only, with no retail store, dropped significantly from 2013 (74.7%) to 2014 (64.3%) ($p<0.01$), with a corresponding significant decrease in US-based vendors (71.9% in 2013 and 65% in 2014). Most vendors did little to prevent youth access in either year, with 67.6% in 2013 and 63.2% in 2014 employing no age verification or relying exclusively on strategies that cannot effectively verify age. Effective age verification strategies such as online age verification services (7.1% in 2013 and 8.5% in 2014), driving licences (1.8% in 2013 and 7.4% in 2014, $p<0.01$) or age verification at delivery (6.4% in

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2013 and 8.1% in 2104) were rarely advertised on IEV websites. Nearly all vendors advertised accepting credit cards, and about ¾ shipping via United States Postal Service, similar to the internet cigarette industry prior to federal bans.

Conclusions—The number of IEVs grew sharply from 2013 to 2014, with poor age verification practices. New and expanded regulations for online e-cigarette sales are needed, including strict age and identity verification requirements.

INTRODUCTION

The 2014 US electronic cigarette market was estimated at \$2.5 billion¹ and forecast to reach \$10 billion by 2017, eclipsing cigarette sales by 2023.² Nearly 20.4 million US adults have tried e-cigarettes, with prevalence rates increasing steadily.³ Among youth, e-cigarette use is now twice as prevalent as combustible cigarette smoking.⁴ The Surgeon General has called for expanded surveillance of the e-cigarette market.⁵ This includes internet e-cigarette vendors (IEVs), which capture 30% of US sales, more than any other store type category,¹ offering convenience, at least 466 brands and 7764 unique flavours.⁶

Youth access is a critical concern with online e-cigarette sales. In 2015, 11% of teen e-cigarette users reported buying them online, and while 30% of teen e-cigarette users were refused sale in physical stores, only 12% were refused sales at online stores.⁷ A recent content analysis of 57 IEV websites found that 37 (64.9%) vendors used some form of age verification, with 35 relying on self-verification (such as a checkbox) and two vendors requesting the buyer's date of birth (DOB), yet apparently failing to verify it with public records databases.⁸ No other content analyses of IEVs⁶⁹ have reported findings about age verification, purchase and delivery options used by IEVs. A recent youth purchase study by our team tested the age verification practices of IEVs¹⁰ and observed a youth purchase success rate of 93.7%, with *none* of the 98 studied vendors complying with North Carolina's 2013 online e-cigarette age verification law.¹¹ As has been the case with cigarettes,¹²¹³ easy online access could encourage use among youth who may have difficulty obtaining e-cigarettes from other sources. Another concern is that inexpensive online e-cigarette vendors may be attracting price-sensitive consumers of e-cigarettes and other tobacco products.¹⁴

While online e-cigarette sales transactions are currently not restricted in their methods of payment and delivery, the US Food and Drug Administration (FDA) asserted jurisdiction over and issued the first federal regulations affecting e-cigarettes in 2016,¹⁵¹⁶ requiring age verification for online sales. However, the rules did not specify *how* age should be verified and what constitutes acceptable and effective age verification. Nevertheless, in September 2016, the FDA issued warning letters to 55 tobacco retailers for making sales to minors in one of the first federal tobacco regulation retailer compliance check operations ever to include online retailers.¹⁷

In the future, FDA regulations affecting online sales may specify minimum standards for age verification practices and may further restrict online sales using the model that the federal government used to restrict hard-to-target online vendors of *cigarettes*, by using elements of our Quarantine of Unhealthy Internet Trade (QUIT) Framework¹⁸ to interrupt the business between internet cigarette vendors (ICVs) and the companies with which they need to do

business to complete their sales: their payment processors and shipping companies. Use of credit cards or PayPal for buying cigarettes online and use of United Parcel Service (UPS), FedEx or DHL for deliveries has been banned under voluntary agreements with the government since 2005.^{19–22} The Prevent All Cigarette Trafficking (PACT) Act²³ reinforced the shipping bans and added United States Postal Service (USPS) to the list of banned shippers in 2009. It also required age verification with government records databases at the point of order and with photo ID at delivery. The FDA may follow a similar approach with new regulations or potentially expand the aforementioned policies to include e-cigarettes.

Surveillance of the internet e-cigarette marketplace is crucial to informing FDA e-cigarette regulation and enforcement actions. An analysis of IEV websites will help inform regulatory action by expanding existing surveillance research⁶⁸ with new data and a substantially larger sample size than any previous study of online e-cigarette sales. It will also provide a baseline of IEV practices before federal regulation with which to compare data currently being collected about vendor practices after FDA regulations take effect. Prior studies^{68,9} have included small samples of IEVs and have not attempted to estimate the size of the population of IEVs, which is important to understanding and regulating this industry. Our previous research on ICVs has shown that the size of the industry grew steadily from 88 to 775 vendors prior to federal regulation, but has shrunk substantially following increasingly restrictive regulations.^{18,24,25} By providing a more detailed picture of the online e-cigarette marketplace, this study will inform development and enforcement of the FDA's new policies to restrict e-cigarette sales to minors and minimise the negative impact of internet tobacco vendors (ITVs) on public health.

METHODS

Website identification procedures

This study aimed to first identify, as closely as possible, the population of IEVs, and to then conduct website content analyses of the most popular vendors. It includes two cross-sectional samples collected in 2013 and 2014. While prior website content analysis studies employed structured web queries using popular internet search engines to identify potential websites,^{8,9,26} our methodology yields a larger and more diverse population. We identified IEVs from a concurrent study of the practices of ITVs selling all types of tobacco products.²⁷ We used several sources to identify potential ITVs, as described in figure 1 depicting study sampling sources and procedures.

In January 2013, we employed complex automated search algorithms, developed and updated annually since 2004, to search 180 million websites, newsgroups, message boards and spam emails for IEVs, yielding 14 171 potential IEV links. Huang *et al*²⁸ analysed Twitter posts containing e-cigarette keywords, yielding an additional 17 102 uniform resource locators (URLs), of which 16 705 were excluded after testing indicated that URLs tweeted fewer than 20 times were unlikely to be functional IEVs. We identified the remaining sites from prior work²⁹ by our research team (n=522), sites linked from promotional sites identified during screening (n=522) and sites identified by R.J. Reynolds (n=129).³⁰ Ultimately, we manually screened 32 446 websites for eligibility from March to May 2013.

During the same period in 2014, we identified a second cross-sectional sample of IEVs by following a similar sampling strategy as the previous year, including review of 15 285 potential ITVs identified by search algorithms, 15 515 potential ITVs identified in our previous research and 439 potential ITVs linked from promotional websites identified during screening. During this second wave, we manually screened 31 239 URLs for eligibility, resulting in the exclusion of 28 143 URLs because they were defunct, duplicates or did not sell e-cigarettes.

Sample identification procedures

We used Alexa's (<http://www.alexa.com>) traffic rankings³¹ as a quantifiable measure of popularity to identify the most visited IEVs for inclusion in the content analysis study. For 2013, we included the 236 most visited e-cigarette vendors (originally planning for 200, some popular ITV sites initially identified during preliminary screening as not selling e-cigarettes were found to sell them on deeper examination during content analysis, and included in the sample), as well as an additional 45 IEVs that were not among the most popular e-cigarette vendors but were among the 200 most popular vendors of cigarettes, little cigars or other tobacco products and *also* sold e-cigarettes, resulting in a final sample size of 281 popular IEVs. In 2014, we used the same methodology to select the 206 most popular IEVs, along with 77 ITVs that were among the most popular vendors in other tobacco product categories but who also sold e-cigarettes, resulting in a sample size of 283 popular IEVs.

Coding procedures and content analysis

We created offline archives of all websites in the study sample between May and October of 2013 and 2014 using software applications Wysigot V.6.1, SiteSucker V.2.4 and Evernote V. 5.0. Whereas some prior studies collected data from live sites,⁸²⁶ we collected our data from archival copies using OnTrAC (Online Tracking, Auditing and Coding), our proprietary data collection application built for analysing website content. Two data collectors completed content analysis of each website, and OnTrAC flagged any inter-rater discrepancies for resolution by senior staff. Final records were cleaned and analysed with SAS V.9.3. Analyses included frequencies, descriptive statistics and χ^2 tests to evaluate significant differences between groups from 2013 to 2014.

Measures

We collected descriptive demographic data across all sites (table 1), details of age warnings and age verification strategies employed (table 2) and payment methods accepted and delivery methods offered (table 3).

RESULTS

IEV population

In 2013, we identified 980 English-language IEVs selling e-cigarette products for home delivery. Of the IEVs identified in 2013, 36.8% had gone out of business by 2014, comparable with the rate of attrition for ICVs prior to federal regulation.²⁵ Screening done

in 2014 identified 3096 IEVs, a threefold increase in the number of vendors over the previous year.

Website location and characteristics

Most IEVs sold online-only (with no retail store) with a significant decrease from 74.7% in 2013 to 64.3% in 2014 ($p<0.01$), and few vendors had Native American affiliation (table 1). Although vendors were identified in at least 38 countries, 71.9% featured a US location in 2013 (65.0% in 2014) and 14.9% were in the United Kingdom (14.7% in 2014). While 88.1% of vendors appeared to be based in a single country, 11.7% gave indications of business operations in two or more countries, such as a Swiss mailing address and a US toll-free phone number. The proportion of popular vendors located in the US dropped significantly from 2013 to 2014, with most of the increase in international vendors coming from Europe. Drops in US vendors in some states may indicate the vendors went out of business or that they were no longer as popular in 2014 as the international vendors identified.

As noted, 36.8% of vendors went out of business between 2013 and 2014. By 2014, only 31.0% of vendors were still in business *and* received enough visits to be included in the 2014 sample. Thirty-three vendors (11.7%) had gone out of business, 1.0% were still in business but no longer selling e-cigarettes and 56.2% were still in business but had dropped in traffic rankings relative to other sites, so were not among the most visited sites selected for the 2014 sample.

Youth access

While more than half of vendors featured warnings about the minimum age to purchase tobacco products on their home page (table 2), this was not indicative of a pattern of those vendors using effective age verification tools. Further, not only was age verification rigour poor, as an industry, IEVs were doing a *worse* job of youth access prevention in 2014 than in 2013.

From 2013 to 2014, χ^2 tests indicated significant decreases in the proportion of popular IEVs featuring age warnings (from 59.8% to 52.3%, $p<0.05$). There was also a significant increase in the proportion that featured *no* age verification at all (from 6.0% to 11.3%, $p<0.05$).

More than half of vendors relied *only* on age verification strategies that *cannot* effectively verify age (such as a checkbox to indicate the buyer is of legal age, a passive (and false) statement indicating that submitting an order certifies the buyer is of legal age or that accepting only credit cards for payments limits buyers to those of legal age (which is false, as minors may obtain prepaid debit cards, debit cards on their own checking accounts or credit cards issued on their parents' accounts)). There was a significant increase in vendors claiming to require a copy of the buyer's driving licence from 1.8% in 2013 to a still low 7.4% in 2014 ($p<0.01$), with only nominal increases in other potentially effective forms of age verification such as online age verification services or age verification at delivery. During the same time, the proportion of vendors featuring the false claim that accepting only credit cards ensures buyers are adults (common among ICVs)^{1832–36} increased significantly

from 0.7% to 7.8%, whereas the overall proportion of vendors using ineffective age verification methods remained steady over the study period at near 90%.

About a third of vendors in both years used age verification strategies that could *potentially* verify age, primarily DOB. Few used it in conjunction with a more rigorous age verification strategy. Even fewer vendors (6.4% in 2013, 8.1% in 2014) claimed to use age verification at delivery, the only opportunity for face-to-face age verification in an online sale.

Payment and delivery

IEVs accepted a wide variety of payment methods (table 3). While 97.2% accepted credit cards and 23.1% accepted PayPal in 2013 (both of which are banned payment methods for internet cigarette sales), other payment options such as prepaid cheques, personal cheques and e-cheques were fairly common. A year later, there was a significant decrease in the proportion of vendors accepting credit cards (to 92.6%), and a significant increase in the proportion of vendors using bank transfers and relatively little-known money transfer services, such as Dogecoin, MoneyGram, Dwolla and CarrotPay.

Nearly all popular IEVs (96.1%) shipped to US customers in 2013, with significantly fewer shipping to the USA in 2014 (90.8%), $p<0.05$. The USPS was, by far, the most commonly used carrier delivering to US customers, used by about three-quarters of vendors in both years, with about a quarter offering UPS, and half as many offering FedEx as offered UPS. Many vendors did not specify on their websites how they ship their products, and a growing number are using courier services.

DISCUSSION

With 980 unique ITVs selling e-cigarettes for home delivery in 2013, the number of IEVs had surpassed the number of ICVs ($n=775$) at the height of that industry.¹⁸ Even with more than a third of 2013's ITVs going out of business a year later (a rate comparable to the preregulation ICV industry),²⁵ the number of unique IEVs identified in 2014 had ballooned to 3096. It may come as no surprise that in the absence of federal regulation, few websites have used effective age verification strategies, as doing so would likely reduce their profits. This is very similar to what was found in the early years of the ICV industry prior to federal regulation.³³³⁵

Website location and characteristics

Unlike the early years of the internet cigarette sales industry where more than half of vendors were located on Native American reservations,³⁷ very few IEVs were affiliated with a Native American tribe. This may be because Native tribal businesses could easily obtain untaxed cigarettes to sell inexpensively and advertise as tax-free, and in the absence of widespread e-cigarette taxes, this advantage is eliminated. Furthermore, tribal tobacco businesses may foresee similar regulatory restrictions coming for IEV sales as they saw heavily restrict their ICV businesses and are avoiding investing into selling this new (and less related to traditional tribal tobacco use practices) product line.

The upward trend in online vendors with a retail location from 2013 (25.3%) to 2014 (35.7%) could be a result of vendors attempting to reach more customers by taking advantage of the regulatory vacuum and capitalising on the increasing popularity of electronic cigarettes. Continued surveillance of the IEV industry and evaluation of the impact of recent federal regulations will show if this trend continues or reverses.

With more than a quarter of popular e-cigarette vendors located outside the USA in 2013 growing to more than a third in 2014 (and with more than 10% indicating more than one country location, further complicating determination of legal jurisdiction while clearly targeting US customers), the FDA and US Customs enforcement departments will need to foresee and address challenges posed by these international and multinational sales; merely identifying incoming packages can be a major challenge. In our study of e-cigarette sales to minors online, only 3 of 11 packages received from outside the country¹⁰³⁸ bore customs declarations that clearly declared the products being shipped as containing e-cigarettes and only one bore other labelling (eg, return address) that clearly identified it was coming from a tobacco product seller. Others had misleading declarations (eg, that they were ‘lipstick’ or ‘gift pen sets’).

Youth access

Our finding that more than 80% of vendors in both years included language implying that visiting the site or submitting an order certifies legal age, is concerning—and our larger study found a lower proportion of vendors (under 60%) featuring age warnings than in Mackey *et al*⁸ who found age warnings on 78.9% of 57 IEV websites. Other studies of IEV websites have not examined youth access prevention in-depth. It is concerning that more than half of 2013’s vendors (61.6%) relied exclusively on age verification methods that cannot, by their very nature, verify age, but that proportion did decrease a year later to 51.9%. This decrease is not nearly as impressive, however, when accounting for the significant increase in the proportion of vendors making no attempts to verify age year over year (6% in 2013 to 11.3% in 2014).

While just more than a quarter of vendors used DOB for age verification, which *could* be used in combination with buyers’ contact information to verify age in public records databases, it is unlikely most did so, as in another study by our team, most vendors requesting DOB appeared not to verify it with public records databases,¹⁰ and few used it in conjunction with a more rigorous age verification strategy.

While the proportion of vendors requiring a driving licence number or image increased from 2013 (1.8%) to 2014 (7.4%), as well as an increase in vendors claiming to use age verification at delivery (6.4% in 2013 up to 8.1% in 2014), these small proportions do not sufficiently negate the fact that effective age verification is practically non-existent on e-cigarette vendor websites. This resulted in a 93.7% sales rate to minors in our youth purchase study.¹⁰ There is a documented disparity between vendor *claims* about use of online age verification services¹⁰ and age verification at delivery,³⁹ and *actual* vendor practices in that few that claim to use these age verification strategies actually do so, further easing youth access. There were 25 cases of vendors saying they ‘may’ require a type of age

verification without necessarily doing so; in our e-cigarette purchase survey,¹⁰ five vendors claimed to use age verification at delivery, but none actually did.

Overall, the IEVs studied were doing a worse job of youth access prevention in 2014 than 2013; this is likely explained by the increase in popularity of international sellers targeting US customers, which may see themselves as beyond US jurisdictional reach. Because IEVs are doing such a poor job of using effective age verification, regulators, researchers and parents should further investigate the number of teens who are obtaining e-cigarettes from online sources.

Payment and delivery

The state of online e-cigarette payments and deliveries is very similar to that of the internet cigarette sales industry prior to regulation,²⁵ with nearly all vendors accepting credit cards and a variety of other payment methods available. While federal regulation²³ bans all the major shipping companies (USPS, FedEx, UPS and DHL) from shipping cigarettes to consumers, no such regulation affects e-cigarette sales, leaving these carriers free to deliver unlimited e-cigarettes to consumers, most of which receive them via USPS. While nearly all vendors, regardless of their country location, clearly targeted US customers, there was a small but significant decrease in the proportion of vendors shipping to US customers from 2013 to 2014, which may be indicative of the increase in the popularity of IEVs targeting customers in other countries.

The US regulations affecting payment and shipping for internet cigarette sales could be extended to apply to e-cigarette sales as well, which when combined with enforcement, would substantially cripple the IEVs' ability to process transactions and deliver products to their customers. It is possible that the industry is anticipating such forthcoming regulations as evidenced by the year over year decrease in the proportion of vendors accepting credit cards in favour of alternative methods of payments (such as bank transfers) as well as the overall proportion in both years of vendors not specifying the shipping methods used. The increase in the proportion of overseas vendors may also contribute to these changes.

CONCLUSIONS

Effective regulation of ICVs over the years has been complicated by issues of jurisdiction, difficulty enforcing regulations and vendors' adaptability to regulatory change. In the absence of targeted, specific regulation and enforcement actions, tobacco product vendors take little action to comply with public health recommendations and related efforts to prevent sales to minors.

Today's online e-cigarette sales industry closely resembles the online cigarette sales industry before regulations such as the PACT Act²³ and agreements between Attorneys General and the credit card and delivery companies.²⁵³² The FDA's current youth access prevention requirements for other tobacco products provide little guidance to vendors about how to effectively prevent online sales to minors, only specifying that sales to minors violate the law. Ideally, there would be evidence-based and proven online age verification systems that

could be mandated and a comprehensive enforcement programme to detect vendors that sell to minors.

Follow-up surveillance is needed to determine whether FDA's newest youth access regulation and enforcement strategy for deeming will reduce the rate of illegal internet e-cigarette sales to minors. If FDA regulations and enforcement efforts are not effective, then the FDA may want to consider other stepped up strategies that have been successful in restricting online cigarette sales, such as restricting payment processors and shipping methods.²⁵³²

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What this paper adds

- ▶ Three small-sampled studies have assessed internet e-cigarette vendor (IEV) sales practices.
- ▶ Prior studies showed that 65% of IEVs use some form of age verification, with nearly all relying on ineffective self-verification.
- ▶ A youth purchase study by our team observed a 94% youth purchase success rate from 98 IEVs, with none complying with North Carolina's 2013 age verification law for internet e-cigarette sales.
- ▶ No other study of IEVs has reported in-depth findings about age verification, purchase or delivery options used by these sellers.
- ▶ We now know that more than 3000 IEVs existed in 2014, prior to federal regulation, a more than threefold increase over the prior year.
- ▶ Use of rigorous age verification among IEVs is rare, most rely on age verification strategies that *cannot* effectively verify age, and IEVs were doing a worse job of youth access prevention in 2014 than the year before. Payment and delivery methods advertised by vendors were similar to the internet *cigarette* vendor industry prior to federal restrictions banning the use of credit cards, PayPal, and United States Postal Service, United Parcel Service and FedEx; these methods are widely advertised by IEVs.

Figure 1.
Sampling for internet e-cigarette vendor content analysis.

Table 1

Demographic features of internet tobacco vendors (ITVs) selling e-cigarettes

	2013 n=281	2014 n=283
Feature	ITV sites, n (%)	ITV sites, n (%)
Selling from a retail shop [*]	71 (25.3)	101 (35.7)
Native American affiliation	5 (1.8)	7 (2.5)
Number of countries		
One country	248 (88.3)	249 (88.0)
Two countries	27 (9.6)	28 (9.9)
Three or more countries	6 (2.2)	6 (2.1)
Country		
USA ^{†,‡}	202 (71.9)	184 (65.0)
Florida	30 (14.9)	27 (14.7)
California	28 (13.9)	31 (16.8)
New York	25 (12.4)	25 (13.6)
Texas	11 (5.4)	8 (4.3)
Virginia [†]	11 (5.4)	4 (2.2)
Illinois	9 (4.5)	8 (4.3)
Arizona [†]	8 (4.0)	1 (0.5)
Pennsylvania	8 (4.0)	9 (4.9)
North Carolina	7 (3.5)	6 (3.3)
New Jersey	6 (2.1)	11 (6.0)
Other [§]	53 (26.2)	53 (28.8)
US, state not specified	9 (4.5)	10 (5.4)
United Kingdom	47 (16.7)	53 (18.7)
China	15 (5.3)	13 (4.6)
Canada	9 (3.2)	7 (2.5)
Other Europe [¶]	24 (8.5)	35 (12.4)
Other Asia [¶]	12 (4.3)	15 (5.3)
Other Americas [¶]	1 (0.4)	0 (0.0)
Other Africa [¶]	1 (0.4)	5 (1.8)
International (country not specified)	9 (3.2)	4 (1.4)
Location not specified	4 (1.4)	4 (1.4)

^{*} p<0.01 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[†] p<0.05 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[‡] The percentages for states represent the per cent of US vendors, not of all vendors.

[§]2013: 'Other' states include one to six vendors in each of the following states: CO, CT, DE, GA, HI, ID, IN, KY, MA, MD, ME, MI, MN, MO, NE, NH, NM, NV, OH, OK, OR, SC, SD, TN, UT, WA, WI. 2014: 'Other' states include one to five vendors in each of the following states: CO, CT, DE, GA, HI, IA, IN, KY, MA, MD, ME, MI, MN, MO, NE, NH, NV, OH, OK, OR, SC, UT, WA, WI.

[¶]2013: 'Other' countries include one to three vendors in each of the following countries: Europe: Belgium, Cyprus, Czech Republic, France, Germany, Ireland, Italy, Latvia, Netherlands, Sweden, Europe (country not specified); Asia: Australia, Hong Kong, India, Malaysia, New Zealand, Philippines, Singapore, United Arab Emirates, Asia (country not specified); Americas: US Virgin Islands; Africa: South Africa. 2014: Other countries include one to seven vendors in each of the following countries: Europe: Cyprus, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Poland, Romania, Spain, Sweden, Europe (country not specified); Asia: Australia, Hong Kong, India, Indonesia, Malaysia, Republic of Korea, Singapore; Africa: Cote D'Ivoire, Egypt, Kenya, Morocco, South Africa, Uganda.

Table 2

Age verification methods used by internet tobacco vendors (ITVs) selling e-cigarettes

	2013 n=281	2014 n=283
Strategy or method	ITV sites, n (%)	ITV sites, n (%)
Age warning on home page [*]	168 (59.8)	148 (52.3)
No attempts to verify age at all [*]	17 (6.0)	32 (11.3)
Uses <i>only</i> age verification strategies that cannot effectively verify age [*]	173 (61.6)	147 (51.9)
Age verification strategies that cannot effectively verify age [†]	252 (89.7)	244 (86.2)
User clicks checkbox/button	128 (45.6)	126 (44.5)
'Submitting order' certifies age	232 (82.6)	227 (80.2)
Accepts only credit card payments [‡]	2 (0.7)	22 (7.8)
Age verification strategies that could <i>potentially</i> verify age [†]	91 (32.4)	104 (36.7)
Date of birth	75 (26.7)	82 (29.0)
Date of birth only	8 (2.8)	4 (1.4)
Date of birth+less rigorous strategy [§]	47 (16.7)	50 (17.7)
Date of birth+more rigorous strategy [¶]	20 (7.1)	28 (9.9)
Claims to use online age verification service	20 (7.1)	24 (8.5)
Site claims age verified at delivery	18 (6.4)	23 (8.1)
Sending a copy of driving licence [‡]	5 (1.8)	21 (7.4)
Entering driving licence number	2 (0.7)	5 (1.8)
Social Security Number	1 (0.4)	3 (1.1)
Call customer service	0 (0.0)	1 (0.4)
Challenge question	0 (0.0)	1 (0.4)

The data in the table include both vendors who reported they would use the age verification strategy and those that said the user 'may be' required to undergo that type of age verification, including three 'may be' answers for date of birth, five for claiming to use an online age verification service, 14 requiring sending a copy of a driving licence and two requiring entry of a driving licence number.

^{*} p<0.05 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[†] Because some vendors offer multiple age verification methods, subcategories are not mutually exclusive.

[‡] p<0.01 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[§] Less rigorous strategies include user clicks checkbox/button, 'submitting order' certifies age and accepts only credit card payments.

[¶] More rigorous strategies than date of birth include all other strategies listed below date of birth.

Table 3

Purchase and delivery methods used by internet tobacco vendors (ITVs) selling e-cigarettes

	2013 n=281	2014 n=283
Strategy or method	ITV sites n (%)	ITV sites n (%)
Methods of payment [*]		
Credit card [†]	273 (97.2)	262 (92.6)
PayPal	65 (23.1)	75 (26.5)
Money order/certified cheque/cashier's cheque	38 (13.5)	34 (12.0)
Bank transfer [‡]	33 (11.7)	48 (17.0)
Personal cheque	32 (11.4)	23 (8.1)
E-cheque	31 (11.0)	32 (11.3)
Cash on delivery	12 (4.3)	9 (3.2)
Western Union	8 (2.8)	10 (3.5)
Skrill (formerly named Moneybookers)	5 (1.8)	3 (1.1)
Bitcoin [‡]	1 (0.4)	7 (2.5)
Sagepay	1 (0.4)	5 (1.8)
MoneyGram [‡]	0 (0.0)	3 (1.1)
Other ^{†,§}	3 (1.1)	26 (9.2)
Methods of delivery [*]		
USPS [¶]	219 (77.9)	209 (73.9)
UPS	63 (22.4)	73 (25.8)
FedEx ^{**}	41 (14.6)	39 (13.8)
DHL [‡]	7 (2.5)	18 (6.4)
Pickup from vendor [†]	6 (2.1)	0 (0.0)
Courier [†]	0 (0.0)	11 (3.9)
Other ^{††}	0 (0.0)	4 (1.4)
Not specified	48 (17.1)	35 (12.4)

UPS, United Parcel Service; USPS, United States Postal Service.

^{*} Because some vendors offer multiple payment and shipping options, subcategories are not mutually exclusive.

[†] p<0.01 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[‡] p<0.05 (data reflecting statistically significant differences between 2013 and 2014 are boldfaced).

[§] 2013: 'Other' payment methods include one to two vendors offering each of the following: Afterpay, Gopay (both found one each in 2013 but not in 2014), Mail in cash. 2014: 'Other' payment methods include one to two vendors offering each of the following: Dwolla, Giropay, Interac, WebMoney, Maestro, Bankersdrafts, CarrotPay, Coinbase, Payson, Virtapay, Walley, Wiretransfer-NS, AlertPay, Payza, Litecoin, Dogecoin, Ideal, Paga, POD and Mail in cash.

[¶]Internet e-cigarette vendors that shipped to the USA were classified as using USPS if they used any shipping method that results in delivery by the USPS in the USA, including international postal services (such as SwissPost), and more general references to types of mail including air, international, postal, express and priority.

^{***}FedEx includes vendors that advertised using Bongo International (2013, n=1; 2014, n=2), which was acquired by FedEx in December 2014.

^{††}2014: 'Other' shipping methods include one to three vendors offering each of the following: Local driver, Ontrac.

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