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Clicking Into Harm's Way: The Decision to Purchase Regulated Goods Online

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Abstract

The growth of the Internet has expanded e-commerce, opening a vast array of purchasing options for consumers while also increasing illicit sales. Such sales place consumers at risk. This study examines consumers' decisions to purchase cigarettes and prescription pharmaceuticals, two highly regulated goods, from online vendors. Drawing on a statewide survey of nearly 1,000 residents in Michigan, we assess the prevalence of Internet purchases of these goods, the differences between those who make these purchases online and those who do not, and the factors associated with Internet purchase decisions. In general, it was discovered that the prevalence of Internet purchases of these goods is relatively low, but the frequency with which the sales are illicit is relatively high. Additionally, the factors that explain the decision by consumers to purchase these items online and their reasons for doing so vary by product type. The study offers a discussion of these findings and their implications for crime prevention and further research.

Keywords

online, Internet, pharmaceuticals, cigarettes, crime prevention

Introduction

The advent of the Internet and the growth of virtual marketplaces have dramatically changed the ways in which legitimate goods and services are marketed and sold to consumers. Since June of 2006, the number of people across the globe using the Internet has more than doubled, growing from 1.17 billion users to 3.61 billion (www.

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internetworldstats.com/emarketing.htm). Today nearly 50% of the world's population is connected to the Internet in some way. While not all people use the Internet to shop for goods and services many do, with Internet users living in developed nations being those most likely to shop online. For example, in 2015, 69% of American adults shopped for goods and services from Internet sources (Mintel, 2015), while 65% of Internet users in Europe purchased products from e-commerce sites (Reinecke, 2015).

While growth of the Internet has expanded opportunities for legitimate trade and commerce, it has also helped facilitate the sale and distribution of many illegitimate goods. Online marketplaces allow criminals an efficient and effective way to sell illegitimate products to unwitting consumers, in part by controlling the cues they experience (Fejes & Wilson, 2013). When a consumer shops at a physical marketplace he or she may be able to see clear indications of illicit activity (e.g., the market is located in a place with a reputation for criminal activity, or there are other criminal activities such as drug dealing occurring at the location) that may influence whether the shopper will buy a product or go somewhere else. However, virtual marketplaces allow criminals to employ sophisticated veils of legitimacy (Benson & Simpson, 2009) that make themselves and their goods appear trustworthy and safe.

Criminals working on the Internet seek to take advantage of the fact that consumers are not always able to discern who should and should not be trusted online (Cheung & Lee, 2006; Jarvenpaa, Tractinsky, & Vitale, 2000; Urban, Sultan, & Qualls, 2000). This creates a situation where those looking to buy regulated goods on the Internet place themselves into an inherently risky situation, and on a path toward potential victimization. For example, the sale of regulated goods, especially those that can be ingested in the body, through unregulated virtual marketplaces constitutes a significant public safety issue. The severity of this issue is due partly to criminals' ability to hide the illegitimate nature of the goods they peddle, but is primarily due to the fact that the use of counterfeit and illicit cigarettes and prescription pharmaceuticals can cause serious health problems for consumers.

This article seeks to advance understanding of the reasons why consumers go to the Internet to purchase two forms of ingestible, regulated goods—cigarettes and prescription pharmaceuticals. Through a review of relevant literature and an exploration of recently collected data, we investigate the prevalence of this practice, identify key characteristics that distinguish online buyers from those who do not buy regulated goods online, and describe consumers' rationales for purchasing regulated goods on the Internet. Following this, we discuss several implications drawn from these findings that relate to crime prevention and consumer behavior. We conclude with a summary of the limitations of this study and lessons for developing future research.

The Online Sale of Cigarettes and Prescription Drugs

E-commerce websites can be key to sustaining and increasing a business's strategic advantage because the Internet allows sellers to tailor a customer's experience, reduce costs, and increase profit margins (Piris, Fitzgerald, & Serrano, 2004). The Internet has reduced or negated many barriers to entry that once protected the sale of certain goods

and services, and businesses that make e-commerce strategies a central part of their overall marketing and sales strategies become highly competitive (Chang, Jackson, & Grover, 2003; Drew, 2003). The spread of the Internet has also led to the formation of businesses based solely on a strict e-commerce marketing strategy (Kaplan & Sawhney, 2000; Mahadevan, 2000). Two products that have realized rapid and stable e-commerce growth are cigarettes and prescription pharmaceuticals (Mackey & Nayyar, 2016), which are also two of the most regulated goods in the United States if not the world.

We focus on cigarettes and prescription pharmaceuticals because the virtual and physical sale of these goods are stringently restricted to qualified individuals (i.e., individuals of legal age and those with a valid prescription, respectively), irrespective of the context or location within which sales occur. Cigarettes and prescription pharmaceuticals are traditionally distributed and sold through licensed and regulated channels for many reasons, chief of which may be the desire to control who has access to these products, as well as to control the quality of the products consumers receive. The growth of unauthorized Internet marketplaces offering these items for sale makes it more difficult to control who purchases these products and extremely difficult to assess the quality of the goods sold prior to their sale. Additionally, the Internet makes it easier for criminals to take advantage of consumers who may be looking to purchase regulated goods through unlicensed or unauthorized channels.

Risks of Internet Pharmacies

Research exploring the use of the Internet to purchase pharmaceuticals gives an inconclusive picture regarding the number of people who go online to buy prescription drugs. According to the U.S. Government Accountability Office (2013) and the Pew Charitable Trust (Fox, 2004), as much as 25% of Americans have purchased pharmaceuticals online. Yet other scholars have found that only about 4% of Americans have purchased pharmaceuticals online (Vries, 2004). According to Atkinson, Saperstein, and Pleis (2009) the percentage of Americans who have bought drugs online increases when vitamins and nonprescription drugs are included, yet 5.6% of their sample had purchased prescription pharmaceuticals online. Research by the Michigan State University Institute for Public Policy and Social Research (2011, 2012, 2013) found that the percentage of Michigan residents using the Internet to purchase prescription pharmaceuticals increased over 3 years from 5.2% to 9.4%.

The sad reality is that many Internet pharmacies exist as an avenue that allows consumers to avoid traditional checks and balances that exist to prevent the unauthorized distribution of fraudulent medicines (Weiss, 2006), and it has been estimated that as many as 35,000 illicit Internet pharmacies are currently in operation (The Center for Safe Internet Pharmacies, 2016; LegitScript, 2016). The Center for Safe Internet Pharmacies (2016) further states that as many as 82% of Internet pharmacy sites have tailored their offerings and business models to attract American consumers.

Yet not all Internet pharmacies pose risks to consumers. A typology of Internet pharmacies developed by Littlejohn, Baldacchino, Schifano, and Deluca (2005) identified four distinct categories of websites: legitimate pharmacies, subscription pharmacies,

lifestyle pharmacies, and no-prescription pharmacies. The websites identified as legitimate pharmacies were the only type to require a valid medical prescription before dispensing drugs to a consumer. The other three website categories offered drugs to consumers through a type of pay-for-access service to no-prescription pharmacies (subscription pharmacies), by allowing consumers to hold an online consultation with a physician (lifestyle pharmacies), or by simply selling drugs without any prerequisites (no-prescription pharmacies). Of the websites examined by Littlejohn et al., 8.6% turned out to be legitimate pharmacies, while 51.4% were lifestyle pharmacies and another 28.6% were no-prescription pharmacies.

This suggests that the vast majority, possibly even as many as 90%, of the Internet pharmacies currently operating may offer consumers access to regulated drugs without requiring appropriate medical prescriptions. Unless consumers are directed to buy from a particular site by their health care provider or some other legitimate source, or unless the consumer has verified the legitimacy of a particular site on their own, there is a high likelihood of selecting an illicit pharmacy. Research conducted by the Michigan State University Institute for Public Policy and Social Research (2011, 2012, 2013) found that Michigan residents who purchased prescription medications online typically used a website referred to them by their doctor or their employer. However, the third most common method used to find an Internet pharmacy was through the use of an Internet search engine.

The danger of illicit Internet pharmacies has been recognized by both the U.S. Government Accountability Office (2014), as well as the U.S. Food and Drug Administration (2016). Each of these agencies has joined numerous industry associations in stressing the dangers of buying prescription drugs from unapproved marketplaces in an attempt to raise consumers' awareness of the dangers of illicit Internet pharmacies. However, it is not always easy for consumers to recognize the signs of an illicit Internet pharmacy and the advice given to consumers may not prevent them from purchasing from these sites.

For example, on its website the U.S. Food and Drug Administration gives the following suggestions to consumers: "Be wary of websites that send you drugs with unknown quality or origin, doesn't provide a way to contact the website by phone, offers prices that are dramatically lower than the competition, or may not protect your personal information"; "check the physical appearance of the medicine (color, texture, shape, and packaging) and check to see if it smells and tastes the same when you use it"; and "look for privacy and security policies that are easy to find and easy to understand." These suggestions assume that consumers will be able to determine drug quality or the composition/origin of the products they receive and are able to otherwise engage in self-protective behaviors not common to the typical consumer.

The U.S. Food and Drug Administration website does give several very good suggestions for buying prescription pharmaceuticals online, including suggesting that consumers "only buy from state-licensed pharmacy websites located in the U.S.," that they "don't buy from websites that sell prescription drugs without a prescription," and to "check with your state board of pharmacy or the National Association of Boards of Pharmacy to see if an online pharmacy has a valid pharmacy license and meets state

quality standards." However, it is unclear how many Americans are aware of these messages, which may play an important role in protecting patients, as ever increasing numbers of Americans find themselves needing to purchase their drugs online (Clifton, 2004; Oliver, 2000).

Selling Cigarettes Online

Laws governing the sale of tobacco (21 U.S.C. §387) make it difficult to legally purchase cigarettes and other tobacco products online under any circumstance, irrespective of the consumer's age. In addition to the requirement that sellers of tobacco products verify the age of a purchaser, unless the purchaser is traveling out of the country with the purchased products federal and local sales and usage taxes must be collected with proper tax stamps affixed to the product. The issues of youth smoking and tax collection have been prominent in discussions regarding the sale of cigarettes online, as Internet vendors can easily avoid age verification requirements and rarely, if ever, collect applicable federal or state sales and usage taxes.

In terms of underage access to cigarettes, several researchers have found that many cigarette websites provide little to no age-related protections (Bryant, Cody, & Murphy, 2002; Fix et al., 2006; Unger, Rohrbach, & Ribisl, 2001). While many anti-smoking campaigns have taken to the Internet and social media in an attempt to encourage youth to avoid cigarettes and tobacco, the Internet is replete with messaging and images that glamorize and promote smoking and the use of tobacco products (Ribisl, 2003). These dueling messages are likely to find new audiences if the trend of raising the minimum age to purchase tobacco found in several western U.S. states picks up around the rest of the nation. Specifically, in 2016 California and Hawaii raised the minimum age to purchase tobacco to 21 years, the same as the legal drinking age. The Internet may offer an easy to access alternative for smokers between the ages of 18 and 21 years who were previously engaging in a legal activity but have now been disenfranchised.

For adult smokers, the decision to buy cigarettes online is in many ways an economic decision, as regular smokers can realize significant cost savings by shopping lost-cost marketplaces found on the Internet (Hrywna, Delnevo, & Staniewska, 2004; Hyland, Higbee, Bauer, Giovino, & Cummings, 2004; Kim, 2002; Kim, Ribisl, Delnevo, & Hrywna, 2006). In particular, the common anti-smoking tactic of raising cigarette taxes to substantially increase the financial costs of smoking, thereby decreasing the number of people who take up smoking, may be especially counterproductive. Consumers who are the most sensitive to cigarette tax increases may be more likely to turn to the Internet to purchase cigarettes rather than to abandon, or even reduce, their cigarette smoking (Goolsbee, Lovenheim, & Slemrod, 2010). The smokers who are most likely to be sensitive to cigarette tax increases are heavy smokers and younger smokers, who tend to buy from private sellers and purchase cigarettes from overseas vendors (Cantrell, Hung, Fahs, & Shelley, 2008).

Smokers living in New York, the state with the highest cigarette taxes in the nation, seem to have the greatest economic reasons to avoid paying high prices for

cigarettes, and research by Davis, Farrelly, Li, and Hyland (2006) finds that 37% of smokers in New York purchase from what they call "low price" sources, such as Native American reservations or the Internet. The authors also state that raising cigarette taxes is one of the most effective ways to curtail smoking among all populations, yet they likely discount the role of Internet tobacco retailers whose products become more attractive as state cigarette taxes increase. Furthermore, Internet cigarette retailers have consistently shown that they are willing to ignore federal and state laws regulating the sale of tobacco products online, particularly when it comes to age verification procedures and the collection of taxes (Ribisl, Kim, & Williams, 2002; Williams, Ribisl, & Feighery, 2006).

Finally, the prevalence of counterfeit cigarettes found on illicit Internet websites is high, which places smokers at greater health risks than they would face through the consumption of traditional, legitimate cigarettes. Research on the chemical composition on counterfeit cigarettes has found them to contain significantly greater amounts of cadmium, lead, and thallium (Pappas, Polzin, Watson, & Ashley, 2007), as well as higher amounts of beryllium, arsenic, molybdenum, antimony, and mercury (Swami, Judd, & Orsini, 2009) as compared to legitimate cigarettes. Smokers who turn to the Internet to purchase low price, or as they are commonly marketed "cheap," cigarettes are likely placing themselves at great risk for harm.

The Internet and Consumer Decision Making

People choose to buy products from Internet retailers for a number of reasons including holding positive perceptions about the usefulness of the product (Lian & Yen, 2014), having convenient access to a range of products coupled with an easy purchasing process (Jiang, Yang, & Jun, 2013), and having the ability to quickly analyze other users' opinions about their product experiences (Wu, 2013). Furthermore, perceived cost-savings of shopping online relative to buying from physical retailers have a significant impact on consumers' intentions to purchase goods from Internet sources, as does the ease with which products can be found and transactions completed (Limayem, Khalifa, & Frini, 2000). Lower prices for goods sold on the Internet leads consumers to perceive there are fewer financial risks associated with purchasing the product, which increases the likelihood of the consumer completing the transaction (Bhatnagar, Misra, & Rao, 2000).

However, consumers are typically reluctant to purchase products when they perceive there is a high degree of uncertainty about whether the product will perform as expected (Bhatnagar et al., 2000), or if they are concerned that the product will not be delivered or that the wrong product will be sent (Grabner-Kraeuter, 2002). Consumers may also be concerned about the risks related to data security breaches (Kim, Tao, Shin, & Kim, 2010), or they may have concerns about seller misrepresentations (Chen & Xie, 2008). Consumers will seek to mitigate their exposure to risk as best they can (Aldás-Manzano, Lassala-Navarre, Ruiz-Mafe, & Sanz-Blas, 2009; Antony, Lin, & Xu, 2006; Bhatnagar & Ghose, 2004). For Internet retailers, both legitimate and illegitimate, increasing consumers' trust in their operation and decreasing their

perceptions of risk increases the likelihood of the consumer making a purchase (Heinonen, Holt, & Wilson, 2012; Kim, Ferrin, & Rao, 2008; Wilson & Fenoff, 2014).

Decreasing or addressing consumers' perceptions of risk is essential to the success of Internet businesses selling regulated goods, and the operators of illicit Internet marketplaces have realized the importance of establishing believable signs of legitimacy (Wilson & Fenoff, 2014). In particular, creating a perception of legitimacy and engendering consumer trust becomes part and parcel to the seller–consumer relationship (Kim et al., 2008; Jarvenpaa et al., 2000; Urban et al., 2000), particularly when the seller is offering illegitimate goods. While Internet marketplaces allow for easy virtual interactions among people and organizations that are separated by wide spatial distances, they do not allow strong interpersonal relationships to develop as would happen within traditional buyer–seller relationships (Doney & Cannon, 1997; Walter, Ritter, & Gemünden, 2001). As a result, Internet-based commerce relationships are highly transactional in nature, a situation that requires sellers to quickly and positively establish trust and legitimacy with potential buyers (Bhattacherjee, 2002; Kim, Song, Braynov, & Rao, 2005).

Gaining consumers' trust and presenting signs of legitimacy can reduce perceived risks, which in turn will increase the likelihood that a consumer will buy a particular product or purchase from a particular website (Chang & Wu, 2012). Therefore, the operators of a website that sell illegitimate goods need only convince consumers that their website is safer and less risky than other e-commerce alternatives. This drives variation in the techniques illicit Internet marketplaces use to draw customers to their sites and variation in the type and quality of information presented to consumers in an effort to get the individual to buy from the site. Yet every effort made to present a superficial appearance of legitimacy (Benson & Simpson, 2009) is an attempt to shift the criminal opportunity structure in favor of the criminal.

Opportunities for crime, including product counterfeiting, develop when motivated offenders come into contact with targets deemed suitable for victimization within an unguarded, or poorly guarded, space (Cohen & Felson, 1979; Hollis, Fejes, Fenoff, & Wilson, 2015; Hollis & Wilson, 2014). The veils of legitimacy used by the operators of illicit Internet marketplaces work to reduce guardianship and increase the likelihood of a suitable target visiting the illicit marketplace, thereby allowing target and offender to interact. Criminals peddling illicit goods online leverage the Internet as a largely unguarded space where suitable targets are plentiful. At the same time, virtual marketplaces create a multitude of opportunities for offenders and targets to meet without requiring an offender to actively engage with a target (Heinonen et al., 2012; Reyns, Burek, Henson, & Fisher, 2013; Reyns, Henson, & Fisher, 2011). The efficiency of e-commerce platforms can make shopping online a relatively easy experience compared with shopping in a physical marketplace. As consumers become more comfortable using e-commerce sites to purchase regulated goods, it is likely the case that they will be increasingly exposed to motivated offenders and the illicit goods these offenders are selling.

Increased comfort and familiarity with online shopping may lead people to engage in fewer self-protective behaviors or to see personal guardianship measures as less

important than they previously believed. Reducing one's level of self-protective behaviors in situations where opportunities for victimization are high will significantly increase their exposure to motivated offenders. As previous research has identified, there is no shortage of motivated offenders on the Internet who use legitimate business features, such as signs, symbols, and trademarks, as veils of legitimacy for their illegal acts (Fittler, Bősze, & Botz, 2013; George, 2006; Ivanitskaya et al., 2010; Rost, 2000). Furthermore, consumers' may not have the ability to accurately detect illicit Internet retailers, even when they are actively looking to identify illicit pharmacies (Ivanitskaya et al., 2010). However, even when consumers know a site to be illicit some will still choose to purchase from that site, particularly if their motivation is to obtain a product they would otherwise have difficulty obtaining or if they are extremely price sensitive (Moodie, Hastings, & Joossens, 2011).

A Study of Consumer Behavior

Research Questions

Our examination of consumers' attitudes, beliefs, and behaviors was guided by three related research questions. These questions reflect our interest in gaining a better understanding of the frequency with which consumers purchase regulated goods from online marketplaces, a desire to understand and identify the factors that distinguish those who purchase regulated goods online from those who do not, and an interest in understanding buyers' reasons for choosing a virtual marketplace over a physical location. Answers to these questions will also help us understand issues of guardianship and exposure to victimization in situations where potential victims make conscious choices to engage in what could be very risky behaviors.

The first question we sought to answer related to how often the Internet was used by consumers to purchase regulated goods:

> **Research Question 1:** What proportion of people have purchased cigarettes or prescription pharmaceuticals from an online marketplace?

Answers to this question will lead to estimates of the prevalence with which consumers use the Internet to purchase a highly regulated good. Additionally, a series of survey questions were developed to allow us to gain a better understanding of the factors that lead respondents to choose the Internet as a source for regulated goods.

The second research question reflects our curiosity about differences between consumers who have purchased regulated goods online and those who have not:

> **Research Question 2:** Are there important differences between people who have gone online to buy cigarettes and prescription pharmaceuticals and those who have not?

Answers to this question will allow us to determine if there is something unique about individuals who purchase regulated goods online in terms of their demographic

characteristics, attitudes about the Internet, or their behaviors while online. Should important differences emerge between online buyers and nonbuyers, these differences can be used to develop interventions or highlight opportunities for crime prevention and risk mitigation strategies.

The final research question we posed centers on understanding why people choose to go online to purchase cigarettes and prescription pharmaceuticals:

> **Research Question 3:** What reasons do people give for going online to buy cigarettes and prescription pharmaceuticals?

Answers to this question should offer us rich detail about the specific reasons consumers chose to buy regulated goods online rather than in person. While there is much literature discussing consumers' desire to purchase goods online, including consumer desire to purchase counterfeit or other illicit goods online, no study to our knowledge has identified the reasons why consumers turn to the Internet specifically for cigarettes and pharmaceuticals. As such, results of this study will contribute substantially to knowledge of consumer choice in the online environment, as well as develop knowledge and understanding of the factors that most commonly influence consumers' use of the Internet to purchase highly regulated goods with significant health implications.

Method

Data Collection

The data used in this study come from the 72nd wave of the State of the State Survey (SOSS), a public opinion survey of Michigan citizens over the age of 18 years. The SOSS is conducted by the Institute for Public Policy and Social Research at Michigan State University. The 72nd wave of the SOSS was conducted in the winter of 2016. The survey has been conducted several times per year (although the number of waves per year varies) since 1994. Each wave of the SOSS consists of three categories of questions: demographic core questions, non-demographic core questions, and non-core client questions.

Questions from the demographic core and non-demographic core areas are standard across all waves of the SOSS. The questions found in the non-core client questions will vary across survey waves, as these questions are included in the survey at the request of a researcher or organization. The data we analyze in this study come from all three sections of the 72nd wave of the SOSS, with questions specific to use of the Internet and the purchase of regulated goods coming from the non-core client questions section. Interviews were conducted between December 5, 2015, and March 26, 2016, with adult members of Michigan households whose phone numbers were randomly selected from a statewide directory.

Approximately 1 week prior to the beginning of data collection, households selected to receive a phone call were sent a letter indicating that an attempt to contact the

household would be made. When contact was successfully made, an adult member residing in the household was randomly selected to complete the survey; selection was made using the Trohldal–Carter technique. If no contact had been made after nine call attempts and it was determined that the number had been called over a variety of time periods, the number was retired as a nonworking number. The average interview lasted just over 26 minutes, and the median completion time was 25.00 minutes. Further details on the SOSS methodology can be found at: http://ippsr.msu.edu/survey-research/state-state-survey-soss/soss-data.

Sample

The SOSS uses Computer Assisted Telephone Interviewing to gather data from a representative sample of Michigan adults. The sampling frame consisted of all non-institutionalized, English-speaking adults in Michigan, who lived in a home with a landline phone or who had a cell phone. Because the SOSS is conducted multiple times each year a portion of the sample is derived from previously interviewed individuals who agree to be re-interviewed. Many of the measures we examine were only included in the 72nd wave of the survey, so we treat new respondents and re-interviewed respondents the same. All data have been weighted to be representative of the state's population as a whole.

A total of 995 individuals completed a survey during the 72nd wave, representing an overall response rate of 16.4%. The average number of calls made to individuals who completed a survey was 4.0, and a total of 85,620 calls were made to landline and cell phone numbers (this includes individuals who participated as well as those who refused and those who did not answer). Because of our focus on use of the Internet to purchase goods, we have removed the 133 respondents who reported never having used the Internet from the final sample. Characteristics of the 862 individuals who completed a survey and have previously used the Internet are displayed in Table 1. The respondents were split almost equally in terms of sex (50.5% female) and marital status (53.9% were married). The majority of respondents were White (79.1%), and one-third lived in a suburban community (33.1%). The respondents were 44.6 years old, on average, and nearly half (49.1%) stated that their current financial situation is "Good."

Table 1 also displays population metrics for the State of Michigan. A comparison of this study's sample to that of the population from which it was drawn show that in terms of sex and race the sample is highly reflective of the population. The median age for the sample (45) is 6 years higher than the median age for the state (39), yet it should be expected to be higher as the population's median age includes persons below 18 years of age—this group was excluded from the study's sampling frame. In terms of education, 96.9% of survey respondents had completed high school, while 41.1% completed a bachelor degree or higher; state-wide 89.3% of people have completed at least a high school education, and 26.4% have completed a bachelor degree or higher.[1]

Table 1. Demographic Characteristics.

	Sample		Population (state of Michigan)	
Sex	*N*	%	*N*[a]	%
Male	427	49.54%	4,881,907	49.20%
Female	435	50.46%	5,040,669	50.80%
Total	862	100.00%	9,922,576	100.00%
Race	*N*	%	*N*[a]	%
White	682	79.12%	7,908,293	79.70%
Black	95	11.02%	1,409,006	14.20%
Other	85	9.86%	605,277	6.10%
Total	862	100.00%	9,922,576	100.00%
Education	*N*	%	*N*[b]	%
Less than high school	27	3.14%	471,035	9.06%
High school graduate	154	17.89%	1,500,532	28.85%
Some college	326	37.86%	1,806,838	34.74%
College +	354	41.11%	1,422,628	27.35%
Total	861	100.00%	5,201,033	100.00%
Age (in categories)	*N*	%	*N*[c]	%
18 to 24	118	13.69%	443,239	12.61%
25 to 29	78	9.05%	283,615	8.07%
30 to 39	138	16.01%	568,700	16.18%
40 to 49	150	17.40%	679,098	19.32%
50 to 59	154	17.87%	695,173	19.78%
60 to 64	55	6.38%	271,431	7.72%
65 and older	110	12.76%	573,577	16.32%
None given	59	6.84%		
Total	862	100.00%	3,514,833	100.00%
Median age	45		39*	
Community	*N*	%		
Urban	110	12.85%		
Suburban	285	33.29%		
Small city/village	247	28.86%		
Rural	203	23.71%		
Other	11	1.29%		
Total	856	100.00%		

(continued)

Table 1. (continued)

Relationship status	*N*	%
Married	465	54.13%
Single	219	25.49%
Divorced	81	9.43%
Other	94	10.94%
Total	859	100.00%
Current financial situation	*N*	%
Excellent	81	9.42%
Good	423	49.19%
Just fair	253	29.42%
Not so good	61	7.09%
Poor	42	4.88%
Total	860	100.00%

[a]2015-2016 estimates. Data obtained from: http://www.census.gov/quickfacts/table/PST045215/26. Population estimates as of July 1, 2015. [b]State adult population aged 25 to 64. Data obtained from: http://www.house.mi.gov/hfa/pdf/highereducation/highered(1-30-14_testimony_miaccess).pdf. [c]2015-2016 estimates. Data obtained from: https://suburbanstats.org/population/how-many-people-live-in-michigan.

Measures

In addition to the demographic measures described in the previous section, we use several other measures that address the following themes: respondent's attitudes, beliefs, and behaviors related to the Internet; respondents' use of the Internet to purchase prescription pharmaceuticals; and respondents' use of the Internet to purchase cigarettes. A listing of each of these measures and related survey questions asked of respondents is displayed in Table 2. Table 3 displays the response choices and related frequencies.

The category of measures capturing respondents' attitudes, beliefs, and behaviors related to the Internet is comprised of seven variables, with all seven having the same set of response choices. Two of these measures assess respondents' perception of self as related to the Internet, specifically whether being online helps them to not feel lonely and whether the Internet makes life easier. Two measures capture respondents' perceptions of the Internet's usefulness in completing tasks: whether the Internet offers an efficient way to find information and whether using the Internet helps them to save time. The final three measures in this category focus on respondents' perceptions of potential drawbacks to the Internet and assess whether respondents' feel it is difficult to protect personal information online, whether the Internet is frustrating to use, and whether there is too much inappropriate information on the Internet.

The prescription pharmaceutical category is comprised of five measures that capture respondents' use of the Internet to purchase prescription pharmaceuticals. The

Table 2. Measures and Description.

Measure	Survey question
LONELY	When I'm online I don't feel lonely
INFO	Going online is an efficient way to find information
EASY	The Internet makes life easier
EFFIC	The Internet helps me save time
PROTECT	It's difficult to protect personal information once it's online
FRUSTRATE	The Internet is frustrating to me
INAPPROP	There is too much inappropriate and bad material online
BUYPHARM	Have you ever purchased prescription medicine on the Internet?
PPURCH	About how many times in the past year have you purchased prescription medications on the Internet?
PSPEND	What is the approximate dollar amount you spend on an average Internet prescription purchase?
PCHOICE	Why do you choose to buy these items on the Internet as opposed to going to a store?
PPRESCRIP	How often are you asked to provide a prescription for your Internet prescription purchases?
BUYCIG	Have you ever used the Internet to purchase cigarettes?
CPURCH	How many times in the past year have you used the Internet to purchase cigarettes?
CSPEND	About how much do you typically spend when you buy cigarettes online?
CCHOICE	Why do you buy cigarettes online instead of going to a physical store?
CQUAL	In terms of quality, how do the cigarettes you have purchased online compare to those you have purchased in a physical store?
VERIF	Have you ever encountered age verification procedures when buying cigarettes online?
VERIFTYP	What type of age verification procedures have you encountered?
MITAX	Do the cigarettes you purchase online ever have a Michigan tax stamp on the pack?
OTHTAX	Do the cigarettes you purchase online ever have another state's tax stamp on the pack?

first measure asks whether the respondent has gone online to purchase prescription pharmaceuticals, while a related measure asks about the number of times the respondent has purchased. Additional measures in this category capture the dollar amount spent online buying prescription pharmaceuticals, respondents' reasons for buying online rather than in a store, and whether the respondent was asked for a prescription before being allowed to buy online.

There are nine measures that comprise the category of cigarette purchase. Similar to the pharmaceutical purchase category, measures in this category ask respondents about whether they have gone online to buy cigarettes, and if so how many times they have done so. Also, respondents who bought online were asked how much they spent

Table 3. Measures and Frequencies.

Measure	Response choices (code)	*N*	%
LONELY	Agree (1)	189	21.93%
	Neither agree nor disagree (2)	45	5.22%
	Disagree (3)	615	71.35%
	Don't know/refused (4)	13	1.51%
	Total	*862*	*100.00%*
INFO	Agree (1)	828	96.06%
	Neither agree nor disagree (2)	12	1.39%
	Disagree (3)	22	2.55%
	Don't know/refused (4)	0	0.00%
	Total	*862*	*100.00%*
EASY	Agree (1)	712	82.60%
	Neither agree nor disagree (2)	30	3.48%
	Disagree (3)	115	13.34%
	Don't know/refused (4)	5	0.58%
	Total	*862*	*100.00%*
EFFIC	Agree (1)	720	83.53%
	Neither agree nor disagree (2)	29	3.36%
	Disagree (3)	112	12.99%
	Don't know/refused (4)	1	0.12%
	Total	*862*	*100.00%*
PROTECT	Agree (1)	704	81.67%
	Neither agree nor disagree (2)	13	1.51%
	Disagree (3)	138	16.01%
	Don't know/refused (4)	7	0.81%
	Total	*862*	*100.00%*
FRUSTRATE	Agree (1)	195	22.62%
	Neither agree nor disagree (2)	20	2.32%
	Disagree (3)	647	75.06%
	Don't know/refused (4)	0	0.00%
	Total	*862*	*100.00%*
INAPPROP	Agree (1)	589	68.33%
	Neither agree nor disagree (2)	38	4.41%
	Disagree (3)	224	25.99%
	Don't know/refused (4)	11	1.28%
	Total	*862*	*100.00%*
BUYPHARM	Yes (1)	51	5.92%
	No (0)	811	94.08%
	Don't know/refused	0	0.00%
	Total	*862*	*100.00%*
PPURCH	0 to 4	41	80.39%
	5 to 9	4	7.84%
	10 or more	5	9.80%
	Don't know/refused	1	1.96%
	Total	*51*	*100.00%*

(continued)

Table 3. (continued)

Measure	Response choices (code)	*N*	%
PSPEND	Less than $25	20	39.22%
	$25 to $50	12	23.53%
	$51 to $100	5	9.80%
	$100 or more	13	25.49%
	Don't know/refused	1	1.96%
	Total	*51*	*100.00%*
PCHOICE	Cost/cheaper	24	42.86%
	Time/convenience	10	17.86%
	Location/transport difficulties	2	3.57%
	Buy larger quantities	1	1.79%
	Other	19	33.93%
	Don't know/refused	0	0.00%
	Total	*56*	*100.00%*
PPRESCRIP	All of the time	29	56.86%
	Most of the time	3	5.88%
	Some of the time	5	9.80%
	Rarely	5	9.80%
	Never	5	9.80%
	Don't know/refused	4	7.84%
	Total	*51*	*100.00%*
BUYCIG	Yes (1)	13	3.26%
	No (0)	386	96.74%
	Don't know/refused	0	0.00%
	Total	399	100.00%
CPURCH	None	11	84.62%
	Once	2	15.38%
	Don't know/refused	0	0.00%
	Total	*13*	*100.00%*
CSPEND	Less than $25	5	38.46%
	$25 to $50	2	15.38%
	$51 to $100	1	7.69%
	$100 or more	1	7.69%
	Don't know/refused	4	30.77%
	Total	*13*	*100.00%*
CCHOICE	Cost/cheaper	10	76.92%
	Other	3	23.08%
	Don't know/refused	0	0.00%
	Total	*13*	*100.00%*
CQUAL	Online much worse	2	15.38%
	Online about the same as store	7	53.85%
	Online much better than store	3	23.08%
	Don't know/refused	1	7.69%
	Total	*13*	*100.00%*

(continued)

Table 3. (continued)

Measure	Response choices (code)	*N*	%
VERIF	Yes (1)	6	46.15%
	No (0)	2	15.38%
	Don't know/refused	5	38.46%
	Total	*13*	*100.00%*
VERIFTYP	Enter date of birth	3	23.08%
	Enter driver's license number	1	7.69%
	Other	3	23.08%
	Don't know/refused	6	46.15%
	Total	*13*	*100.00%*
MITAX	Yes (1)	2	15.38%
	No (0)	6	46.15%
	Don't know/refused	5	38.46%
	Total	*13*	*100.00%*
OTHTAX	Yes (1)	1	7.69%
	No (0)	7	53.85%
	Don't know/refused	5	38.46%
	Total	*13*	*100.00%*

during each transaction, and why they chose to buy online rather than from a physical store. In addition to these measures, several cigarette specific questions were also asked of respondents who had purchased cigarettes online. Specifically, respondents were asked to rate the quality of the cigarettes they purchased online, whether they had encountered age verification procedures during these purchases, and what those procedures were. Finally, these respondents were asked whether the products they purchased from the Internet had a Michigan tax stamp or whether the products had a tax stamp from another state.

Results

Prevalence

In asking the first research question, we sought to arrive at some understanding of the prevalence with which people used the Internet to purchase regulated goods by asking respondents a series of questions about their Internet shopping behavior. The questions asked were, *Have you ever purchased prescription medicine on the Internet?* and *Have you ever used the Internet to purchase cigarettes?* Affirmative responses to each of these questions were low, with 5.6% indicating they had purchased prescription pharmaceuticals online and 2.8% indicating they had purchased cigarettes online. Individuals who reported purchasing prescription pharmaceuticals online were statistically older ($t = 2.893$, $p = .004$) than non-purchasers, yet there was no statistical difference between the two groups in terms of income ($t = 1.456$, $p = .146$). There was no

statistical difference in the average age of smokers who had purchased cigarettes online and those who had not ($t = -.960$, $p = .338$), but there was a statistical difference between the two groups in terms of income as the non-purchasing group reported higher incomes ($t = -3.827$, $p = .002$). None of the respondents indicated they had purchased both cigarettes and prescription pharmaceuticals online.

Because none of the respondents who purchased pharmaceuticals online indicated they had purchased cigarettes online, we conducted several bivariate analyses to determine if those who purchased pharmaceuticals were different in some significant way from those who purchased cigarettes. There were no statistical differences between the two groups in terms of sex ($\chi^2[1, N = 67] = .430$, $p = .512$), race ($\chi^2[1, N = 68] = 2.452$, $p = .117$), education ($\chi^2[3, N = 67] = 2.488$, $p = .477$), or political ideology ($\chi^2[3, N = 67] = 2.040$, $p = .564$). However, there were statistically significant differences in terms of age and income, with cigarette buyers being younger ($t = -2.151$, $p = .049$) and reporting significantly lower incomes ($t = -4.669$, $p = .000$) than those who purchased pharmaceuticals.

Of those who purchased prescription pharmaceuticals online, 66% had done so within the past year (from the date of the survey). The majority of those who had purchased in the previous year (65.0%) purchased two or more times, with the most frequent buyers purchasing 12 times in the past year. Most people who reported buying pharmaceuticals online (40.8%) stated that they spend less than US$25 per transaction, yet 24.7% stated they spend more than US$100 per transaction.

Conversely, the majority of cigarette buyers (62.5%) stated they spend less than US$25 per transaction and only one individual stated they have spent more than US$100 in a transaction. While a majority of those who purchased pharmaceuticals online indicated they had purchased within the previous year, only 15.2% of those who purchased cigarettes online did so in the previous year. The majority of those who bought cigarettes (55.0%) purchased 10 packs during their transactions; this is equal to a carton of cigarettes which is the typical unit of sale for online cigarette vendors.

Those Who Buy Online

We next wanted to understand whether important differences existed between those who have purchased cigarettes and prescription pharmaceuticals online and those who have not. To investigate this possibility we conducted two separate multivariate binomial logistic regression analyses. The first logistic regression analysis was conducted to determine which factors (*age, race, education, lonely, info, easy, effic, protect, frustrate*, and *inapprop)* could reliably distinguish those who have purchased prescription pharmaceuticals online from those who have not. Regression results indicated that the overall model of 10 predictor variables was statistically reliable in distinguishing between the two groups of respondents ($\chi^2[10, N = 862] = 25.084$, $p = .005$).

However, the pseudo R^2 (Nagelkerke $R^2 = .083$) suggests that there is a weak relationship between the predictors and the outcome variable. Additionally, there is no change in the percentage of cases correctly classified (93.4%) when moving from the intercept-only model to the model with predictor variables included. Regression

Table 4. Prescription Purchase Logistic Regression.

Variable	B	*SE*	Wald	Sig.	Exp(B)
Age	0.03***	0.009	11.099	.001	1.031
White	−0.053	0.400	0.017	.895	0.948
Education	0.334	0.208	2.582	.108	1.396
Lonely	0.095	0.191	0.248	.619	1.100
Info	0.160	0.473	0.115	.734	1.174
Easy	−0.513	0.299	2.955	.086	0.598
Effic	0.376	0.222	2.870	.090	1.457
Protect	−0.088	0.213	0.171	.679	0.916
Frustrate	0.551*	0.233	5.600	.018	1.735
Inapprop	−0.128	0.178	0.517	.472	0.880
Constant	−6.570	1.433	21.034	.000	0.001

*$p \leq .05$. **$p \leq .005$. ***$p \leq .001$.

results are presented in Table 4, and a review of related Wald statistics indicated that two variables, *age* (B = .030, $p = .001$) and *frustrate* (B = .551, $p = .018$) were statistically significant predictors. Yet as expected from the low Nagelkerke value and stability in the percentage of cases correctly classified, odds ratios suggest that neither of these independent variables has a strong influence on the decision to purchase pharmaceuticals online.

We next conducted a multivariate logistic regression analysis to determine which factors (*age, race, education, lonely, info, easy, effici, protect, frustrate*, and *inapprop*) could reliably distinguish those who have purchased cigarettes online from those who have not. Regression results indicated that the overall model of 10 predictor variables was statistically reliable in distinguishing between the two groups of respondents ($\chi^2[10, N = 462] = 26.334$, $p = .003$). Unlike the prescription pharmaceutical model, the cigarette model shows a moderate relationship between the predictor variables and the choice to purchase cigarettes online (Nagelkerke $R^2 = .285$). Furthermore, the number of cases correctly predicted in the full model (97.5%) was slightly higher than the intercept-only model (96.8) suggesting that the addition of the predictor variables does aid in correctly sorting purchasers from non-purchasers. Regression results are presented in Table 5, and a review of related Wald statistics indicated that two variables, *info* (Wald = 10.126, B = 1.853, $p = .001$) and *easy* (Wald = 10.081, B = 1.185, $p = .001$) were statistically significant predictors. A review of each variable's odds ratios indicate that both have a strong influence on the outcome variable.

The Decision to Buy Online

To better understand why an individual would make the choice to buy regulated goods from an Internet marketplace, we asked respondents to tell us why they went online to purchase these goods rather than going to a traditional retail location. Respondents

Table 5. Cigarette Purchase Logistic Regression.

Variable	B	*SE*	Wald	Sig.	Exp(B)
Age	−0.032	0.022	2.181	.140	0.968
White	18.025	4828.848	0.000	.997	6.738
Education	−0.103	0.431	0.057	.811	0.902
Lonely	−0.046	0.484	0.009	.924	0.955
Info	1.853***	0.582	10.126	.001	6.376
Easy	1.185***	0.373	10.081	.001	3.270
Effic	−0.858	0.654	1.719	.190	0.424
Protect	0.077	0.431	0.032	.858	1.080
Frustrate	0.676	0.554	1.491	.222	1.967
Inapprop	0.105	0.381	0.076	.783	1.111
Constant	−24.722	4828.849	0.000	.996	0.000

*$p \leq .05$. **$p \leq .005$. ***$p \leq .001$.

were allowed to give more than one reason, although few did. The reasons each group gave for their decisions varied and highlight unique differences in the motivations held by the purchasers of each of these goods.

For those who bought cigarettes online 74.7% stated they did so because the products they wanted were cheaper online than in the store. None said they bought online due to convenience, transportation issues, feelings of embarrassment, or because of age restrictions. An additional 22% of cigarette buyers indicated they went online to purchase because of "Other" reasons, yet only one individual stated what this other reason was saying they wanted "to try them out." Finally, 3.3% of respondents stated they did not know why they went online rather than going to a physical location. Importantly, 57.6% of cigarette buyers felt that the cigarettes they purchased online where "about the same" level of quality as those they purchase from a physical retail location. Just under one-quarter (23.8%) of cigarette buyers said that the goods they purchased online were "much better" than those found in stores, while 18.7% said that what was available online was "somewhat worse" or "much worse" than the cigarettes they can obtain in physical stores.

Respondents who purchased pharmaceuticals online did so for a wider range of reasons. While the largest group of respondents purchased pharmaceuticals online because of cost considerations (44.7%), a sizeable portion (37.9%) did so for "Other" reasons. Of those responding "Other" to the reasons why they purchased prescription pharmaceuticals online, 53.5% stated they did so because they were required by their employer or their health care plan. The remaining individuals said they bought pharmaceuticals online for reasons such as "item wasn't available in the store," "the insurance would not cover it and it was cheaper to buy it online from Canada," "stores don't have what I want and it's better to go online," and "some things you can't buy in the US and they are approved in Canada."

Importantly, respondents who stated they went online to buy pharmaceuticals because of cost considerations were significantly more likely to state that their current

financial situation was "poor" ($\chi^2[4, N = 56] = 13.049$, $p = .011$). Beyond those who indicated they went online because of cost considerations or "Other" factors, respondents indicated they went online to buy prescription pharmaceuticals because of the convenience (18.6%), because they had transportation issues (3.3%), or because they liked to buy in larger quantities (2.8%). More than half (58.3%) of respondents who indicated they have purchased pharmaceuticals online stated they were asked for a prescription "All of the Time"; 14.1% indicated they are "Never" asked for a prescription. For those who purchased cigarettes online, only 17.5% stated the products they received had a Michigan tax stamp, as required by law, while an additional 4.2% indicated the products they received had a tax stamp from another state affixed to the product. Surprisingly, 47.6% of cigarette buyers stated that they encountered some form of age verification, yet the majority (48.4%) needed to only indicate a date of birth.

Discussion

While there are many positive outcomes for patients, industries, and brand owners that result from the growth of e-commerce platforms (Arruñada, 2004), opportunities for deviant and illicit practices are prolific (Orizio, Merla, Schulz, & Gelatti, 2011). Collectively our findings suggest that a relatively small proportion of people purchase pharmaceuticals and cigarettes online, 5.6% and 2.8% respectively. However, this does not negate the sizeable harms that come from the sale of regulated goods through Internet sites. Furthermore, the fact that cost was such a considerable factor in the decision to purchase prescription drugs (44.7% of those who bought online) and cigarettes (74.7% of those who bought online) is troubling.

The present-day health care issues facing many older Americans, as well as those with serious preexisting medical conditions, may create a situation where it becomes difficult and expensive to obtain optimal levels of care. Should insurance companies increase coverage costs, including prescription co-pays, or stop paying for certain drugs all together, patients may be left responsible for a significantly larger portion of their prescription drug costs. Internet marketplaces offer disenfranchised patients a cost-effective and efficient way to access essential medicines, thereby allowing them to spend less of their disposable income on the maintenance of their health. The individuals in our study who stated they bought prescription drugs online because of cost considerations were significantly more likely to be in poor financial situations.

According to antismoking advocates, one of the most effective ways to reduce rates of smoking among all ages is through increasing taxes on cigarettes. Michigan currently has a 10% per stick tax on cigarettes, equivalent to $2.00 per pack, which is the 14th highest usage tax in the nation. The sale of cigarettes online undercuts the collection of these taxes, which is an issue of serious concern to states like Michigan who depend on tobacco tax revenue to fund essential state-wide programs (Michigan Department of Treasury, 2002). In the pre-Internet era raising sales taxes and placing a greater emphasis on using place managers (e.g., store clerks, owners) to monitor and control who purchased cigarettes would have made significant strides in reducing rates of smoking and protecting minors. In the Internet age, these protections fall away as

online marketplaces offer a range of low-cost products (relative to the products in-store that carry sales and usage taxes) to consumers without enforcing effective age verification procedures.

Age was a significant factor when it came to purchasing prescription pharmaceuticals online, as was the perception that the Internet was not frustrating to use. While it may be common to assume that older Americans are more reluctant to make the Internet a part of their daily lives, research by the Pew Research Center (Zickuhr & Madden, 2012) shows that more than half of adults above the age of 65 years are online regularly and that once these individuals go online they become active in online activities like social networking sites. It is entirely possible that when an individual has a generally unfavorable disposition to using the Internet for commerce and personal transactions, forcing them to conduct personal business online increases their level of comfort with Internet marketplaces. In the aggregate, this may be a beneficial outcome as people who were once reluctant to patronize e-commerce sites and online marketplaces are exposed to the many benefits these outlets offer. However, increasing the level of comfort people have with the use of online marketplace and e-commerce platforms may also lead more people to be exposed to motivated offenders. This is because people may become less concerned about the potential dangers of online marketplaces the more they patronize these websites (Bhatnagar et al., 2000).

A chief concern with increasing numbers of consumers using the Internet to search for prescription drugs is that these consumers may not be able to discern legitimate sites from illegitimate sites. It remains to be seen how effective the recent ".pharmacy" initiative supported by the National Association of Boards of Pharmacy® will be, as well as how exactly it will affect consumers' ability to identify trustworthy websites. However, results from our study suggest that for some individuals these attempts will be ineffective as certain consumers turned to Internet pharmacies because the prescription pharmaceuticals they sought to purchase became unavailable through traditional pharmacies, such as those that are likely to be affiliated with the ".pharmacy" initiative.

Furthermore, this study's results suggest that the move to a more efficient handling of patient care (by directing consumers to purchase their prescription pharmaceuticals from online sources) can actually create opportunities for patient victimization. Efforts like the ".pharmacy" program can help mitigate some of these risks, yet issues of cost and drug availability are likely to continue to have a significant impact on consumers' decision making. Consumers who have become comfortable buying pharmaceuticals may have fewer reservations about searching the Internet for sites offering drugs at reduced prices when cost becomes a factor in their decision-making process.

In terms of the decision to purchase cigarettes from Internet sources, smokers who bought online were more likely to view the Internet as an efficient way to find information, and to believe that the Internet makes life easier. Combined with the fact that nearly three-quarters of the individuals who purchased online indicated they did so to save money, the results of this study continue to paint a troubling picture in terms of consumer behavior. Our data reveal that price is the main factor driving smokers to the Internet in search of cigarettes and that these individuals are satisfied with the quality

of product they receive, as more than 80% of those who bought cigarettes online felt that the products were about the same, or of much better quality than the products they could purchase in a physical store.

While we are unable to determine whether the cigarettes these individuals received were counterfeit or legitimate, the perception of these items as high quality likely serves to establish or reinforce positive perceptions of the Internet as a good place to buy cigarettes. Leaving the issue of counterfeit or grey market cigarettes aside, such positive perceptions of Internet cigarettes can lead to a range of other significant issues. It is important to remember that state and federal taxes go largely uncollected when consumers purchase cigarettes from these sites. Just over 21% of smokers who purchased cigarettes online stated that they products they received had a state tax stamp affixed, yet it is impossible to determine if taxes were actually paid to the state for the sale of those cigarettes. Smokers who believe that they can purchase cheap, high-quality cigarettes online without breaking the law by avoiding the payment of sales and usage taxes may have little incentive to stop buying from Internet retailers.

Implications for Crime Prevention

There is an abundance of Internet websites that offer cigarettes and prescription pharmaceuticals to American consumers. When it comes to the cigarettes sold online, these products are in many cases diverted from foreign markets, and in some cases are manufactured in unsanitary and unregulated conditions. Consumers looking for cost savings over traditional retail establishments may see the Internet as an effective alternative, and should these consumers find the quality of the products they receive to be equal to or greater than what they purchase in stores (as did nearly 80% of this study's respondents who purchased cigarettes online), they may have every incentive to buy from an online marketplace.

Policing Internet retailers and enforcing appropriate federal and state laws are significant challenges that are not easily overcome (Cohen, Sarabia, & Ashley, 2001; Ribisl, Kim, & Williams, 2001). The safeguards found in physical retail stores related to the verification procedures that allow only authorized individuals access to regulated goods are not in place in the virtual environment. On the Internet, these safeguards are easily manipulated or they are just ignored, meaning that they do nothing to prevent unauthorized parties from accessing regulated goods like cigarettes and prescription pharmaceuticals (Ribisl, Williams, & Kim, 2003).

Fortunately, situational crime prevention techniques offer suggestions for ways to think about and respond to the risk of illicit Internet commerce. Techniques that can impact consumer decision making, directly and indirectly by taking a place-based approach, should be of primary importance. For example, it is vitally important to raise the vigilance of consumers, particularly those who are more likely to make these types of purchases (e.g., older consumers who are comfortable using the Internet and online marketplaces and those who seek less expensive or otherwise unattainable pharmaceuticals, and smokers who go online in search of low-cost cigarettes or underage smokers seeking to avoid age restrictions found in brick-and-mortar establishments). The aim

here would not necessarily be to keep consumers from making purchases online, but rather to encourage them to take an active role in seeking legitimate Internet-based pharmacists and retailers, thereby protecting themselves and reducing demand for illicit goods.

Important factors to consider with this approach are the substance, form, and delivery of the message. For example, the substance might focus on the association between illicit e-commerce websites and poor-quality products (perhaps emphasizing health and taste consequences), organized crime, impact on the economy through loss of taxes and legitimate jobs, and other detrimental consequences. Awareness strategies that are targeted toward, and effectively reach, the intended recipients in a variety of formats are likely to be the most impactful. One promising avenue highlighted by our study relates to the roles of insurance companies and health care providers, given that many consumers purchased pharmaceuticals online because they were either directed by their provider to do so, or because difficulties with their insurance caused them to lose access to certain medications.

Insurance companies may be uniquely positioned (and incentivized, given negative health consequences and costs of the use of dangerous substances) to raise awareness of illicit online pharmacies and retailers, and to help identify and promote the use of legitimate suppliers. Insurance companies and health care providers should also consider working more closely with law enforcement as a way to reduce opportunities for the illicit sale of these products and to encourage greater guardianship online. These efforts would help strengthen formal surveillance and disrupt illicit marketplaces, which can help reduce opportunities for unsuspecting consumers to be taken in by Internet criminals.

Limitations

Although this study provides helpful context for understanding the complexities and nuances of the sale of regulated goods on the Internet, and potential ways to thwart illicit commerce, it is not without limitations. First, like other examinations of its kind, the response rate to this survey is rather low. While our data are drawn from a representative statewide sample and have been weighted to be representative of the state's entire population, and our analysis suggests the sample matches several key demographics at the state level, it may be possible that non-respondents are somehow different than those who responded to the survey in ways that would substantively influence the findings.

As a result, it is possible that the sample selection procedures do not allow for a truly representative sampling of Michigan residents who have purchased regulated goods online. Only one adult in a household was surveyed, and because this adult was randomly selected it is possible that systematic biases exist within the data. For example, it is possible that the time at which a household was contacted significantly influenced which adults were present and available to complete the survey. While the survey gathered information on the number of adults living in the household, it did not attempt to gather data from anyone other than the randomly selected participant. It is

possible that the random selection of one adult from a contacted household lead to a non-random selection of respondents.

Additionally, because the sample includes only English-speaking adults, study findings may not be representative of the population of non-English speaking Michigan adult residents. Importantly, study results may also be affected by the fact that the call procedures used a random-digit-dial method for landline and cell phone numbers in the state. While this does not present an issue for landline numbers, current Michigan residents who do not have a cell phone with a Michigan-based telephone prefix would not have been included in this study's sample. This means that individuals who moved to Michigan and kept their out-of-state cell phones would not be included in this study's results.

It is also important to consider that the sample only individuals who were residents of the State of Michigan at the time of the survey. We cannot make any generalizations about the extent to which these findings extend to other locations. In fact, given the importance of cost as a key consideration in online purchasing behavior, one might expect the prevalence of purchasing behavior to vary based on tax requirements and other considerations that affect cost in particular locations. Our examination was limited to two forms of regulated products. Importantly, the use of two products permitted us to show that variation exists in the factors that explain purchasing behavior by product. However, our findings do not extend beyond these products and our findings suggest the importance of examining multiple types. Finally, our sample only included adults so we were not able to draw conclusions about youth, who are a fairly significant portion of online consumers. Moreover, due to the age restrictions associated with cigarettes and pharmaceuticals, larger proportions of youth may purchase these goods online where there are fewer or less effective age checks in place.

Future Research

Based on our findings and given the limitations of our study, there are a number of suggestions for future research. Examinations of online purchasing behavior that draw on broader geographical and age samples and incorporate mechanisms to boost the response rate would be very helpful. Similarly, efforts to expand the products examined to other regulated and nonregulated items would enhance our understanding of factors that facilitate and impede sales by product. Our findings suggested a number of strategies that may help reduce the opportunity for illicit Internet sales, but there is limited research on the effectiveness of various strategies in this area. Research aimed at designing and evaluating such interventions, and the circumstances under which they are more and less effective, would offer great value for reducing these crimes and their negative consequences. Finally, it would be important to know more about what insurance companies, brand owners, law enforcement agencies, and other stakeholders are doing to raise awareness of and respond to these risks. This would help us better understand the breadth of existing guardianship and where potential gaps exist, suggesting areas for development.

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1. Figures for Michigan educational achievement retrieved from http://www.census.gov/quickfacts/table/EDU635214/26.

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